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Killing Martin county : resiliency in a central Appalachian community.

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KILLING MARTIN COUNTY:
RESILIENCY IN A CENTRAL APPALACHIAN COMMUNITY

By

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A Dissertation Approved on

April 11th, 2018

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DEDICATION

This dissertation is dedicated to everyone living in Martin County, Ky.

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ABSTRACT

KILLING MARTIN COUNTY:
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David A. Sizemore

April 11, 2018

Environmental stressors, anything that poses a threat to human and environmental health, are disproportionately located in marginalized communities. Coal extraction companies produce and concentrate environmental stressors in Central Appalachia, a sub-region of Appalachia with high poverty rates and economic hardship. Through destructive coal extraction methods, the coal industry has jeopardized Central Appalachian health and environmental quality. The coal industry's power to cause destruction in Central Appalachia is a product of historical strategic initiatives. Since the late 1800s, the coal industry has forcefully altered the culture and ideology of Central Appalachians and developed relationships with local, state, and federal policymakers to deter policy that threatens extraction. Thus, coal companies can cause environmental disasters with minimal backlash from Central Appalachians and policymakers.

This research used an environmental justice framework, alongside a framework of resiliency, to understand the human response following two coal-based disasters in Martin County, Kentucky, a Central Appalachian county. The first disaster occurred on October 11, 2000, when a coal impoundment ruptured and discharged over 300 million gallons of coal slurry into Martin County. The second disaster is the gradual deterioration of Martin County's water infrastructure over time. This research used

grounded theory methods to understand personal experiences of each disaster, feelings towards external assistance, and how residents viewed resiliency in their community. More specifically, this research collected data from 22 semi-structured interviews with vocal residents and observations at four public water meetings. Findings suggest the coal industry, a silent community, and the lack of political oversight influenced historical adaptation of coal-based environmental stressors. Thus, findings further suggest coal's exodus from Central Appalachia engendered community support to resist long-term adaptation of coal-based environmental stressors. Furthermore, these findings inform a path for understanding the broader Central Appalachian region.

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> *"My Great Grandfather spent his days in a coal mine and his nights on the porch in a chair. Now he's in heaven and down here in hell, the rivers run muddy, and the mountains are bare. Old King Coal, what are we gonna do, when the mountains are gone and so are you?"*
>
> - Sturgill Simpson (2013)

Appalachia is a geographic region on the eastern side of the United States. The region consists of 420 counties and spans 13 states. These states include New York, Pennsylvania, Ohio, West Virginia, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, and Alabama. The Appalachian region has historically faced economic hardship and high rates of poverty. More specifically, poverty concentrates in Central Appalachia, a sub-region of Appalachia containing 49 counties in Kentucky, Virginia, West Virginia, and Tennessee (Thorne, Tickamyer, & Throne 2004). Since the late 1800s, Central Appalachia has been home to many coal companies seeking to prosper from the abundance of extractable coal. Coal companies have supported local economic activity, as well as increased the population of many Central Appalachian communities. Concurrently, coal companies are a leading contributor of Central Appalachia's financial situation because the coal industry has exploited and controlled residents of the sub-region (Eller 1982; Salstrom 1994; Maxwell 2011; Scanlan 2010). The industry's presence has deterred a diversified economic structure

(McIImoil & Hansen 2010) and caused environmental destruction in Central Appalachia (Scanlan 2010).

Through destructive coal extraction methods, the coal industry has jeopardized Central Appalachian health and environmental quality. When coal extraction began in the sub-region, companies used underground methods to extract coal. Underground mining increased rates of black lung disease and occupational hazards (Whisnant 1994). Around the 1970s, the coal industry moved to a more destructive form of mining, mountaintop removal mining (MTR), that removes the entire mountain. The environmental impacts of MTR concurrently increase health problems for Central Appalachians, like respiratory problems (Hendryx & Esch 2011; Kaneva 2011; Knuckles et. al. 2013; Hendryx & Luo 2014), birth defects (Ahern et. al. 2011), cancer rates, and organ problems (Hendryx & Esch 2011).

The coal industry has forced Central Appalachians to host the environmental impacts of coal extraction for decades. The industry's power to cause destruction and persist in the sub-region is a product of historical strategic initiatives. The coal industry has forcefully altered the culture and ideology of Central Appalachians and created a "coal heritage" (Lewin 2017: 2). Through this ideological control, Central Appalachians split into two camps: those in favor and those in opposition to the industry. This creates strife and reduces the power of grassroots movements seeking to challenge these injustices (Bell 2013). The coal industry has also established relationships with local, state, and federal policymakers to deter policy that threatens extraction (Burns 2007). They also gain the support of policymakers because policymakers characterize the industry as a significant driver of modernization and industrialization. Policymakers

view their presence as a contributor to local, state, and federal economic growth (Scanlan 2010). As a result, Central Appalachians host environmental externalities (Salstrom 1994).

This research focused on one community in Central Appalachia, Martin County, Kentucky. The county's location in Central Appalachia and socio-economic conditions increase the risk of coal-based environmental disasters. On October 11, 2000, a coal company caused one of the largest environmental disasters in the United States in Martin County. Sometime in the early morning of October 11th, a coal impoundment, containing coal waste, ruptured and released over 300 million gallons of waste into this small Central Appalachian community. When the impoundment broke, coal waste entered and honeycombed into an abandoned underground mine and escaped into local creeks and residential hollows. The failure contaminated local creeks, water sources, soil, and killed aquatic life. Luckily, no one died (Mueller 2000).

At the time, the United States Environmental Protection Agency (EPA) labeled the slurry spill the worst environmental disaster east of the Mississippi. The spill was 20 times larger than the amount of oil spilled during the Exxon Valdez accident in 1989 (Mueller 2000; Bell & York 2010). The Martin County Coal Company (MCCC) owned the coal impoundment, named the "Big Branch Impoundment." MCCC, now defunct, was a subsidiary of Massey Energy Corporation. Immediately following the disaster, MCCC mobilized into residential hollows to clean up the waste (Scott et al. 2012). However, MCCC was unable to stop coal waste from entering into the Big Sandy and Tug Fork Rivers. Communities who use these sources for public water were put under a state of alert by the state of Kentucky (McSpirit et al. 2007). Recovery lasted a couple of

months, and MCCC paid $55,000 to the federal government and $3.25 million in penalties and damages to the state of Kentucky (Union of Concerned Scientists 2010).

Despite the severity of the disaster, the spill received minimal immediate media attention and coverage (Bell & York 2010). The spill in Martin County serves as a stark reminder of the enormous risks coal-mining poses to impoverished communities in Central Appalachia. However, environmental destruction in Martin County was far from over. At the time of data collection, Martin County residents were experiencing a water quality crisis. More specifically, their water was cloudy, brown, smelled, and burned their skin. Breaks in the water infrastructure caused more than an average of 60 percent monthly water loss and allowed contaminants and untreated groundwater to enter into water sources. The water quality crisis in Martin County was also a product of historic coal mining. Coal companies reduce the economy of Central Appalachian communities. Access to clean water is a documented problem in poor Central Appalachian communities (Arcipowski et al. 2017) because they lack funds needed to improve water infrastructure (McSpirit & Reid 2010).

This research studied both the spill and the water quality crisis of Martin County using a framework of resiliency, which looks at the human response to recovery following disasters and crises (Gilbert 2010; Hargrow 2013). Literature suggests two community resources shape resiliency: political capital and social capital. Political capital provides communities with direction (Gilbert 2010). Governments help reduce feelings of uncertainty by informing communities about the disaster and by directing recovery. Social capital refers to any anything that connects a community, like networks, relationships, trust, and collective identity (Gilbert 2010; Cagney et al. 2016; Gil-Rivas &

Kilmer 2016). However, forms of political and social capital reduce in marginalized communities (Henly-Shepard et al. 2015).

Alongside a framework of resiliency, this research used an environmental justice (EJ) framework. EJ frameworks study and uncover the uneven distribution of environmental stressors in poor and minority communities (Bullard 1990; Taylor 2014). Environmental stressors are anything that poses a threat to human and environmental health. These include the effects of climate change (Teves et al. 1996) and soil, water, and air pollution/contamination (Lerner 2010). EJ frameworks contribute to understanding the existence of coal-based environmental stressors in Central Appalachia. EJ frameworks also assist in uncovering the creation, persistence, and social/environmental impacts of environmental stressors globally, nationally, and regionally as with the case of Central Appalachia.

This research used qualitative methods to examine the resiliency of Martin County residents following the spill and the water quality crisis. More specifically, it used a constructivist grounded theoretical approach, a method of qualitative research that generates theory from the data (Charmaz 2009). This approach provided this research the ability to adapt and evolve alongside data collection. Semi-structured interviews with community members included questions about the spill, how they recovered, who offered them support, what barriers hindered resiliency, which led to questions about the water quality and solutions to problems. Observations of community meetings organized to address water quality issues in Martin County provided additional insight into community responses to environmental stressors. The purpose of these meetings was to facilitate community organization to demand that local government fix the water quality crisis.

Data obtained through semi-structured interviews and observations at water meetings informed a framework of resiliency in response to coal-based environmental stressors in Martin County.

The research findings contribute to literature specifically about the Martin County spill, resiliency literature more generally, and addresses the body of evidence documenting environmental injustice in Central Appalachia. Then, this research presents a partial theory of resiliency that emerged from research findings. More specifically, this research uses concepts from Berger and Luckmann's (1966) work on the social construction of reality, social movement literature, and Gramsci's work on hegemony to help explain the emerged partial theory. Next, this research extends other work about the social impacts of the spill in Martin County (McSpirit, Scott, & Hardesty 2005; Scott, McSpirit, & Hardesty 2005; Mcspirit et al. 2007; Scott et al. 2012) by providing more information on the long-term impacts of the spill. It also fills a gap in the resiliency-based literature by using a grounded theoretical approach to understand the perceptions and meanings Central Appalachians hold towards their resiliency. Lastly, the study supports EJ literature, as well as Appalachian literature by providing more data on the social and environmental impacts of the concentration of coal-based environmental stressors in Central Appalachia.

CHAPTER 2: THE LITERATURE

This research used two areas of literature to examine the presence and persistence of environmental stressors in Central Appalachia: Environmental Justice (EJ) and Appalachian scholarship. EJ literature documents the inequitable placement of environmental stressors in minority and poor communities across the U.S. (Bullard 1990; Taylor 2012). Scholarship about Appalachia examines the origin, health/environmental impacts, and persistence of coal-based environmental stressors in Central Appalachia. EJ scholarship complements Appalachian literature by showing how coal-based environmental stressors in Central Appalachia are rooted in the region's history, socio-economic status, and lack of support from political institutions. Furthermore, disaster resiliency literature provides concepts and common themes that uncover resources communities use to recover from disasters. An EJ framework is used in concert with disaster resiliency literature to examine the inequity in resiliency processes of marginalized communities following disasters. Examining disaster resiliency literature through the lens of EJ supports the claim that the socioeconomic status of Central Appalachia, as well as the concentration of environmental stressors, hinders capacity for resiliency. Before these areas of literature are examined, a discussion defining the Appalachian region is presented.

The Appalachian Region:

Geographic and cultural definitions of Appalachia are contested (Scanlan 2010). Influenced by media and state policy, people categorize and understand the region and its people regarding its geography, culture, history, economy, and relationship to the rest of the nation. Media, visual representations, and textual sources often stereotype the region as white, poor, backward, and uncivilized (Massey 2007). For example, *The Beverly Hillbillies (*1962-1971) television show portrayed inhabitants as uneducated and lacking basic social knowledge. The film *Deliverance* (1972) constructed negative representations further through the portrayal of Georgian Appalachians as rapists and murderers. *The Wonderful Whites of West Virginia* (2009), a documentary about an Appalachian family, depicts them as not only dangerous and backward, but as pill users, alcoholics, and prison/jail regulars. Collins (2009) claims negative images created by elites and outsiders marginalize, control, and justify unequal treatment.

Media representations create generalizations of Appalachia with profound and wide-ranging impacts. For example, on Fox News, Bill O'Reilly called Appalachia a region suffering from multigenerational poverty and laziness (Tabler 2009). The popular memoir, *Hillbilly Elegy: A Memoir of a Family and Culture in Crisis (2016)*, by J.D. Vance, critiques the region's backward culture, drug use, and dependency on government assistance programs. Vance, who grew up in Appalachia, attributes his own path out of the region to his strong work ethic. Sources like these are problematic because they ignore structural issues, stress individual responsibility, and assume prosperity is solely the result of hard work and determination. Negative stereotypes, assumptions, and generalizations otherize populations. Otherizing, the act of establishing negative

perceptions that specific populations are better than others, occurs based on race, sex, gender, sexuality, religion, income, education, and geographic region (Scott 2009).

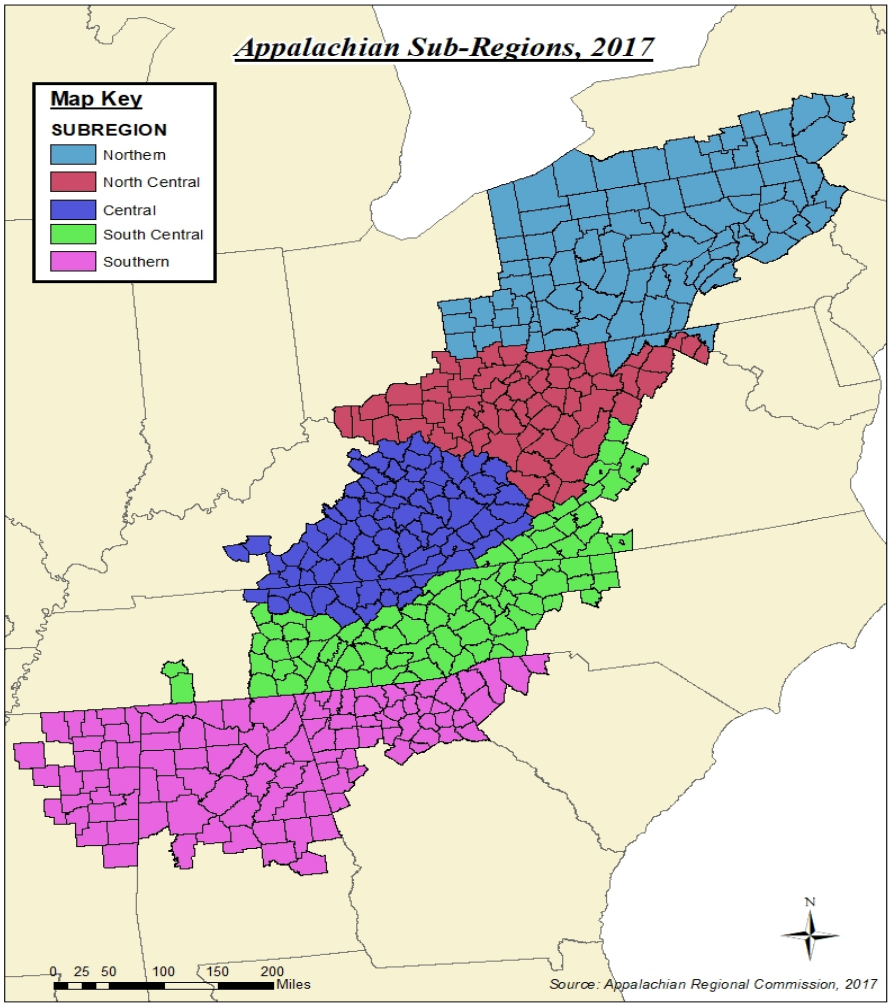
Research representing Appalachian stories can challenge and deconstruct negative perceptions towards the region (Massey 2007). Research can also influence and inform government agencies that shape Appalachian futures, like the Appalachian Regional Commission (ARC). The ARC is a regional economic development agency created under the Appalachian Regional Development Act (ARDA) of 1964. This agency informs the federal, state, and many local governments on the status of Appalachia and helps strengthen the region's economy, education, health, infrastructure, assets, and community engagement (ARC 2017a). Following the ARDA of 1964, Appalachia was formally defined geographically by counties based on socio-economic characteristics; counties included in the ARDA definition received federal funds. The original definition of Appalachia was 360 counties stretching across 11 states. This formal definition has changed over time as the ARC has added counties based on low economic strength (Watts 1978; Ziliak 2012).

As of 2018, the ARC includes 420 counties in its definition of Appalachia. The region stretches across 13 states from southern New York to northeastern Mississippi: other states include Pennsylvania, Ohio, West Virginia, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, and Alabama. See Map 1 *"Appalachian Region"* below. The region spans 205,000 square miles, 42 percent of which is rural (ARC 2017b).

Map 1. Appalachian Region

Initially, the ARC established sub-regions based on similar topography, demographics, and economies for analytical purposes: Northern, Central, and Southern. Today, the ARC identifies five sub-regions: Northern, North Central, Central, South Central, and Southern (ARC 2017b). Each sub-region varies regarding history, economy, education, racial composition, geography, population, and land area. Martin County, Ky is located within the sub-region of Central Appalachia and is the focus of this study. See *Map 2 Appalachian Sub-Regions, 2017 below*.

Map 2. Appalachian Sub-Regions, 2017

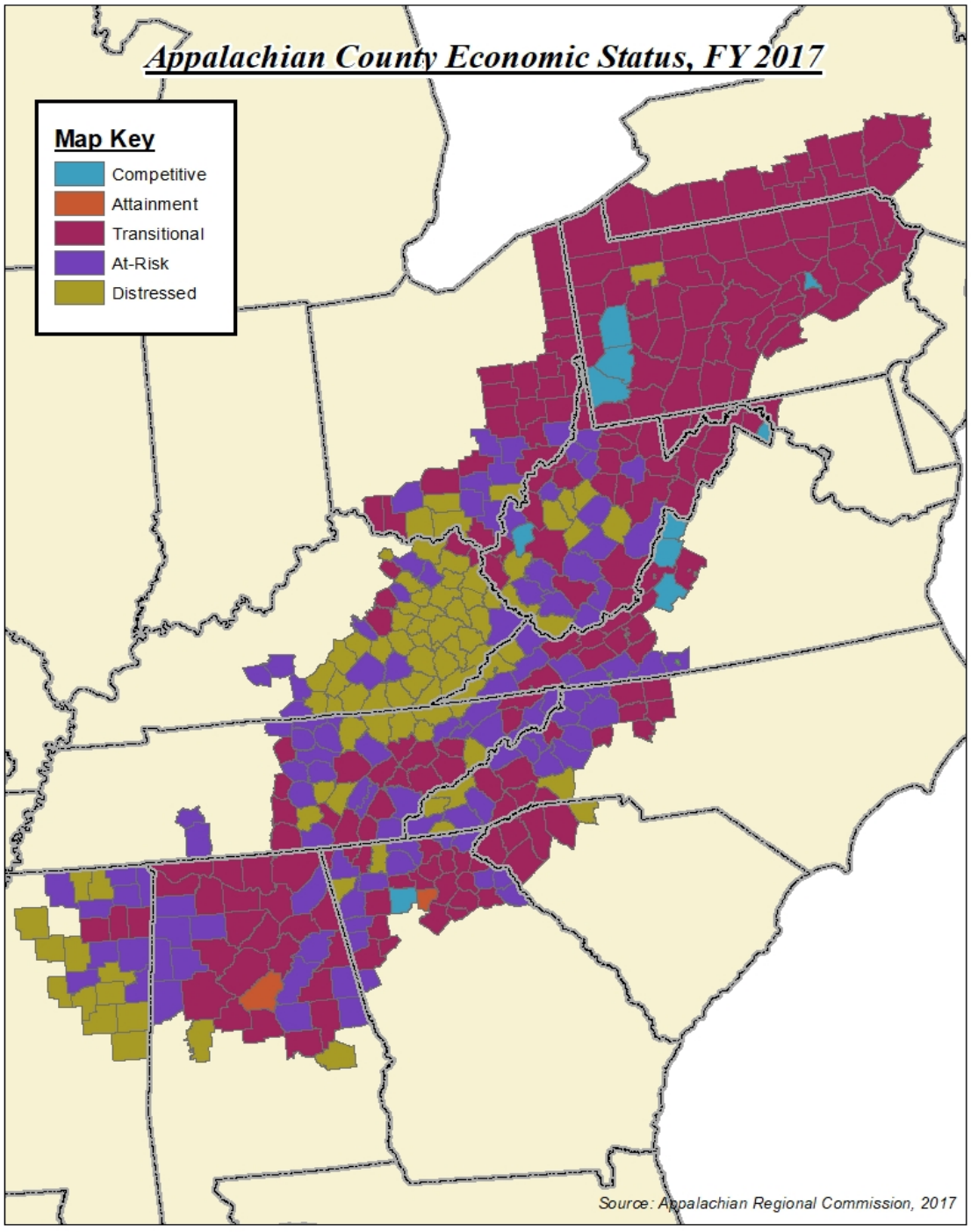


The ARC collects demographic data for each sub-region that includes population, race, income, poverty, education, and employment. The population decreases the closer one gets to Central Appalachia. This sub-region has the lowest percentage of people out of the five sub-regions. All sub-regions are predominately white; Southern Appalachia has the highest percentage of black/African Americans than any other sub-region (18.8) (Pollard & Jacobsen 2017). Central Appalachia has the highest percentage of white individuals and the lowest percentage of black/African Americans (1.9), Hispanics/Latinos (1.3), and other (1.7). It has the highest percentage of individuals with less than a high school diploma and the lowest percentage of those with a bachelor's degree or more. It has the lowest mean ($47,152) and median ($33,956) household income alongside the highest percentage of those in poverty (Pollard & Jacobsen 2017: 61 and 70). It also has the highest percentage of individuals with a disability (23.2) (Pollard & Jacobsen 2017: 85).

The ARC also categorizes Appalachian counties by economic strength using an ordinal scale of five categories based on a three-year average unemployment rate, per capita market income, and the poverty rate for each county. The five categories are attainment, competitive, transitional, at-risk, and distressed (from highest economic status to lowest). Attainment counties are strongest economically and rank in the top 10 percent of counties nationally. Competitive counties compete in the national economy but are not as economically stable as attainment counties. Transitional classification means a county is transitioning from a weak economy to a more stable one. At-risk counties are ones at risk of becoming economically distressed. Lastly, distressed counties have the weakest economy and rank in the worst 10 percent of counties nationally (ARC 2017c). As of

2017, the ARC classifies two Appalachian counties as attainment, ten are competitive, 210 are transitional, 114 are at-risk, and 84 are distressed (ARC 2017c). A majority of distressed counties are located in Central Appalachia. Central Appalachia has 49 distressed counties, 25 at-risk counties, and eight transitional counties; the sub-region does not have any counties classified as either competitive or attainment. Out of the 49 distressed counties in Central Appalachia, 37 are within Kentucky: three are in Virginia, three in West Virginia, and six in Tennessee. Kentucky has the highest number of distressed counties in the entire Appalachian region. The remaining Kentucky Appalachian counties are either at-risk or transitional (twelve and five respectively) (ARC 2017c). *See Map 3 Appalachian County Economic Status, FY 2017 below.*

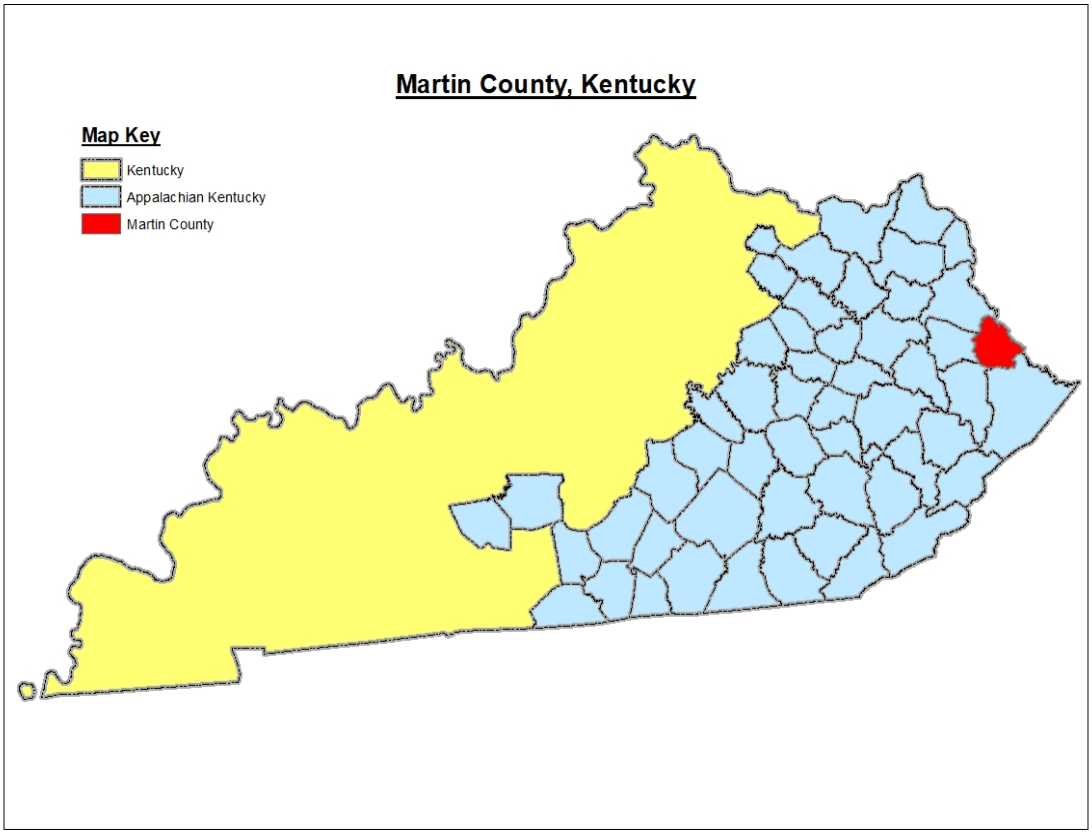
Map 3. Appalachian County Economic Status, FY 2017



Martin County, Ky is a distressed county in the most impoverished sub-region in one of our nation's poorest regions. Martin County is one of 120 counties in the state of Kentucky, nestled within Pike, Floyd, Johnson, and Lawrence County on the border of

West Virginia. *See Map 4 Martin County, Kentucky*. Within the county is Inez, Kentucky (the county seat), alongside many small communities and towns like Beauty, Davella, Debord, Hode, Job, Lovely, Pilgrim, Tomahawk, and Warfield. As of 2016, an estimated 12,478 individuals live in Martin County (U.S. Census Bureau 2016a). However, Martin County is home of the United States Penitentiary Big Sandy and, as of March 6th, 2018, roughly 11 percent of this population (1,345) is incarcerated at Big Sandy (Federal Bureau of Prisons, 2018). Therefore, it is best to discuss Martin County concerning the number of households to get a more accurate representation of who is living in the county. Out of the 4,295 households in Martin County, 99.3 percent are white; the remaining .07 percent are households with two or more races (U.S. Census Bureau 2016a).

Map 4: Martin County, Kentucky



As with many Central Appalachian communities, Martin County experiences economic challenges. The median household income is $29,052 (U.S. Census Bureau 2016a), and 33.2 percent fall below the poverty threshold (U.S. Census Bureau 2016b). Compared to the rest of the counties in Kentucky, Martin County has the 107th lowest median income (U.S. Census Bureau 2016a) and 111th highest percentage of households falling under the poverty threshold (U.S. Census Bureau 2016b) out of 120 counties. Out of 4,295 households, 30.7 percent receive food stamps from the Supplemental Nutrition Assistance Program (SNAP), and 60.2 percent contain one or more individuals with a disability (U.S. Census Bureau 2016b). Of those working in Martin County, 56 percent of households contain no workers, 35.4 percent have one worker, 9.6 have two workers, and .9 percent have three or more workers (U.S. Census Bureau 2016c). With respect to

individual education attainment, the population over 25 who have less than a high school degree is 27.5 percent, a high school degree (or equivalent) is 38.6 percent, some college (no degree) is 19.4 percent, an associate degree is 8.3 percent, a bachelor's degree is 2.3 percent, and a graduate/professional degree is 3.9 percent (U.S. Census Bureau 2016d).

The data provide a deeper understanding of the socioeconomic status of Central Appalachia and Martin County. However, isolating demographic data from historical forces ignores structural barriers many Central Appalachian communities encounter. Ignoring structural barriers further reinforces stereotypes and assumptions of Central Appalachians. Relying solely on media, visual representations, and textual sources, one may assume high poverty rates, low educational attainment, high rates of SNAP redemption, high rates those living on a disability, and high concentrations of distressed counties result from multigenerational poverty, uneducated residents, laziness, weak work ethic, dependency on government assisted programs, low determination, and nil individual responsibility. However, the socioeconomic status of Central Appalachia results from deeply rooted historical structural barriers and inequities influencing the concentration of environmental stressors across the U.S.

Environmental Justice:

The ARC's definition of Appalachia serves as a starting point in understanding the presence of environmental stressors in Central Appalachia. Those living in Central Appalachia are more likely to experience and live in deeper pockets of poverty than any other Appalachian sub-region (Thorne, Tickamyer, & Throne 2004). Socioeconomic status, the social standing of an individual or community measured by education, income,

and occupation (American Psychological Association 2018), is associated with the location of environmental stressors. Across the U.S., stressors are disproportionately in minority and poor communities (Bullard 1990; Taylor 2012). Environmental stressors contribute to adverse health outcomes and reduced social conditions for these populations. Organized efforts emerged in the early 1970s focused on addressing these inequities under the label of Environmental Justice (EJ). The guiding principle behind EJ is that all people and communities, regardless of race or socioeconomic status, are entitled to a healthy environment, as well as equal protection of environmental laws and regulations (Bullard 1996).

EJ was born out of a critique of American environmentalism. American environmentalism has evolved over the decades facilitating new understandings about our connection and interaction with the natural environment. In the early 20th century, American environmentalism emerged to manage the use of natural resources through preservation and conservation, as well as focused on the mitigation and adaptation of resource problems, like energy scarcity and flood control (Dunlap and Mertig 1992). In 1962, Rachel Carson (1962) helped foster a broader understanding of environmental management and protection by showcasing the environmental impacts of Dichlorodiphenyltrichloroethane, or DDT (once a commonly used pesticide). In her book, *Silent Spring*. In *Silent Spring*, Carson exposed the impacts humans have, not only on the natural environment but also human health and well-being. American environmentalism became anthropocentric through the addition of the human element (Scanlan 2010). However, environmentalists were primarily affluent whites (Dunlap and Mertig 1992).

Affluent white environmentalists excluded and silenced the issues and voices of minorities and those of lower socioeconomic status. Marginalized populations began to criticize the composition of American environmentalism being only privileged white individuals. These populations also criticized environmentalists for having NIMBY ("Not in My Backyard") mindsets. Affluent communities have the political, social, and economic power to oppose environmental stressors within their communities (Bullard 1990). As a result, environmental stressors locate within marginalized communities (Pulido 1996). Lastly, marginalized communities critiqued affluent environmentalists for opposing environmentally unfriendly actions at the expense of marginalized populations. An example of this is when affluent populations support environmental protection over jobs and economic opportunity for marginalized communities (Bullard 1990). Over time, these critiques gave rise to EJ as a framework for social movements and research.

Two events showcase historical links between environmental inequities based on race. The first occurred in the summer of 1978, when Robert Burns and Company violated federal law by discharging 31,000 gallons of polychlorinated biphenyl (PCB), a chemical that causes cancer and affects the immune, reproductive, nervous, and endocrine systems of the body (EPA 2014), over 240 miles of rural North Carolina. Once discovered, the state of North Carolina removed the contaminated soil and sought to dispose of it in a landfill. The landfill was in Warren County, North Carolina, a predominantly poor black community. The decision sparked protests and resistance from the community and attracted national media outlets (Mohai, Pellow, & Roberts 2009). The second was the discovery that a DDT manufacturing plant, *Olin Corporation*, discharged an estimated 1 to 2 million pounds of DDT per month between 1947 to 1970

into local water systems. The plant was upstream from the small predominantly black rural community of Triana, Alabama. Unbeknownst to those living in Triana, community members consumed contaminated fish and water for three decades. In 1978, the Center for Disease Control (CDC) tested Triana residents and found high rates of DDT contamination and exposure (Bullard 1990).

These two events are examples of environmental racism, defined by Robert Bullard *(1996: 497),* as "any policy, practice, or directive that differentially affects or disadvantages (whether intended or unintended) individuals, groups, or communities based on race or color." In 1983, The *General Accounting Office* (GAO) examined the racial and economic demographics of communities near four toxic waste landfills in the southeast. The GAO determined that every community located near and around landfills were predominantly black and poor (Taylor 2012). In 1987, *The United Church of Christ Commission for Racial Justice* conducted the first national study to determine the relationship between the location of toxic waste facilities and community demographics. The study, *The Toxic Wastes, and Race in the United States of 1987* found facilities disproportionately locate in minority communities. Three out of five African Americans/Hispanics were found to live in communities with toxic exposure: an estimated 15 million African Americans, 8 million Hispanics, and more than half of the country's Asian and Pacific Islander population (Commission for Racial Justice 1987). Robert Bullard (1990) further documented that hazardous waste facilities concentrate in southern communities with high proportions of people of color. In 1991, the first EJ summit, "*National People of Color Environmental Leadership Summit*" was held to consolidate EJ efforts. The summit established 17 principles intended to guide advocacy

and research. See Figure 1 *The 17 Principles of Environmental Justice* for a list of the EJ principles (NRDC 2016).

Research utilizing EJ frameworks suggests environmental inequities are multifaceted and complex. Initially, EJ research focused on the location of waste facility sites. More recently, the field examines a broader range of environmental stressors (Bullard 1996), such as contaminated water, soil, and air, (Lerner 2010), extreme flooding and sea level rise from climate change (Teves et al. 1996), low-access to healthy food sources (Hilmers, Hilmers, & Dave 2012), and even poor housing options (Kinahan et al. 2017). Research also investigates predictors of environmental stressors. Initially, scholarship suggested the most salient variable was race (Bullard 1990; Pulido 1996). More recently, the field suggests race, class, type of stressor, the role of policy, geography, and regional location all influence the location of environmental stressors (Bullard 1990; Pulido 1996; Mohai, Pellow, & Roberts 2009; Brulle & Pellow 2005; Wright 2005). The consensus among scholars is environmental stressors locate in communities with suppressed political voice. The socioeconomic status of Central Appalachia suppresses political voice (Scanlan 2010). Thus, environmental stressors concentrate in this sub-region. Appalachian scholars utilize EJ frameworks to understand the presence and continuation of environmental stressors in Central Appalachia (Burns 2007; Bell & Braun 2010; Scanlan 2010; Bell 2013).

Figure 1. The 17 Principles of Environmental Justice

1. **Environmental Justice** affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction.
2. **Environmental Justice** demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias.
3. **Environmental Justice** mandates the right to ethical balanced and responsible uses of land and renewable resources in the interest of a sustainable planet for humans and other living things.
4. **Environmental Justice** calls for universal protection from nuclear testing, extraction, production and disposal of toxic/hazardous wastes and poisons and nuclear testing that threaten the fundamental right to clean air, land, water, and food.
5. **Environmental Justice** affirms the fundamental right to political, economic, cultural and environmental self-determination of all peoples.
6. **Environmental Justice** demands the cessation of the production of all toxins, hazardous wastes, and radioactive materials, and that all past and current producers be held strictly accountable to the people for detoxification and the containment at the point of production.
7. **Environmental Justice** demands the right to participate as equal partners at every level of decision-making, including needs assessment, planning, implementation, enforcement and evaluation.
8. **Environmental Justice** affirms the right of all workers to a safe and healthy work environment without being forced to choose between an unsafe livelihood and unemployment. It also affirms the right of those who work at home to be free from environmental hazards.
9. **Environmental Justice** protects the right of victims of environmental injustice to receive full compensation and reparations for damages as well as quality health care.
10. **Environmental Justice** considers governmental acts of environmental injustice a violation of international law, the Universal Declaration On Human Rights, and the United Nations Convention on Genocide.
11. **Environmental Justice** must recognize a special legal and natural relationship of Native Peoples to the U.S. government through treaties, agreements, compacts, and covenants affirming sovereignty and self-determination.
12. **Environmental Justice** affirms the need for urban and rural ecological policies to clean up and rebuild our cities and rural areas in balance with nature, honoring the cultural integrity of all our communities, and provided fair access for all to the full range of resources.
13. **Environmental Justice** calls for the strict enforcement of principles of informed consent, and a halt to the testing of experimental reproductive and medical procedures and vaccinations on people of color.
14. **Environmental Justice** opposes the destructive operations of multi-national corporations.
15. **Environmental Justice** opposes military occupation, repression and exploitation of lands, peoples and cultures, and other life forms.
16. **Environmental Justice** calls for the education of present and future generations, which emphasizes social and environmental issues, based on our experience and an appreciation of our diverse cultural perspectives.
17. **Environmental Justice** requires that we, as individuals, make personal and consumer choices to consume as little of Mother Earth's resources and to produce as little waste as possible; and make the conscious decision to challenge and reprioritize our lifestyles to ensure the health of the natural world for present and future generations.

Central Appalachians face environmental stressors in the form of low access to food sources, hydraulic fracturing (AppVoices 2016a), and exposure to chemical manufacturing plants (Stump 2017). Poor water quality is also an environmental stressor in Central Appalachia (Arcipowski et al. 2017). Many Central Appalachian communities

lack adequate water infrastructure. Poor water infrastructure causes breaks which allow contaminants to infiltrate and contaminate water sources. Access to clean water correlates with income and race (VanDerslice 2011), and Central Appalachian communities lack sufficient funds needed to improve personal water infrastructure. Many Central Appalachians report budgeting for and purchasing bottled water due to poor quality of water (McSpirit & Reid 2010). However, coal companies also produce environmental stressors in Central Appalachia (Burns 2007; Bell & Braun 2010; Scanlan 2010; Bell 2013).

Coal-Based Environmental Stressors in Central Appalachia:

Historically, the coal industry has jeopardized Central Appalachian health and environmental quality. When introduced in the late 1800s, coal was extracted using underground methods requiring miners to mine coal deposits underground manually. Coal miners suffered increased rates of black lung disease, many occupational hazards and even death (Whisnant 1994). As of 2017, underground coal mines remain active, but declining in the region because this method is costly and labor intensive. Coal companies are unable to meet competition demands using underground methods with coal-producing states out west, as well as across the globe. In response to these conditions, the industry began employing less labor intensive and cheaper forms of mining in the late 1970s. The shift has caused coal-mining jobs to decrease by two thirds in the region (Tallichet 2014), as well as increase the severity of environmental stressors in Central Appalachia (Blaacker, Woods, & Oliver 2012).

Surface mining is a cheaper and quicker form of coal mining. Where underground mining extracts coal from underneath the mountain, surface mining seizes it from the top (AppVoices 2013b). Surface mining gives the industry the ability to retrieve the entire coal deposit, an impossible task with underground mining. Mountaintop removal mining (MTR), a type of surface mining, has expanded dramatically in Central Appalachia (Cordial, Riding-Malon, and Lips 2012). MTR mining is a product of the increasing demand for capital and profits (Bell and York 2010). Gould et al. (2008), suggests production and consumption exist in an interchangeable relationship; as production increases, so does consumption (and vice versa). Production and consumption continually operate alongside one another to meet the needs of the other. Ecological disorganization results from capitalist production. This framework, developed by Schnaiberg in the 1980s, is called "the treadmill of production" (TOP). As the treadmill expands, so does the need for environmentally damaging fossil fuels. The treadmill creates, maintains, and increases environmental problems across the globe. EJ and TOP are related concepts because externalities and risks created by the TOP locate in marginalized communities (Brulle & Pellow 2005; Gould et al. 2008; Wilson 2009; Bell & York 2010). Central Appalachia has not been immune to the demands of the TOP. To meet outside production demands, reduce costs, and ameliorate challenges from underground mining, the industry created MTR. MTR is an expected result of the TOP.

MTR mining poses threats to environmental and human health through a systematic process (AppVoices 2013b). The process begins with the removal of overburden, or rocks, vegetation, and sediments, on the summit, through the use of heavy machinery and ammonium nitrate/fuel oil (ANFO). ANFO detonation creates a mixture

of overburden and coal. This process continues until miners recover all retrievable coal. MTR mining destroys the entire mountain and leaves behind a desolate plateau. In 2010, over 500 MTR sites were estimated to exist within the sub-region and are predominantly located in areas with high concentrations of poverty (Epstein et al. 2011: 77).

MTR mining has taken a significant toll on Central Appalachia's environment. MTR mining practices deforested and caused habitat loss (Kaneva 2011). Central Appalachia's topography is 40 percent flatter than it was 40 years ago (Ross, Brian, & Bernhardt 2016); MTR mining is the dominant driver of this loss (Palmer et al. 2010). MTR mining negatively affects air quality by releasing coal particulate matter (Kaneva 2011). Valley fills are created from accumulated overburden. Often several miles long (Kaneva 2011), valley fills locate at the bottom of, or near MTR sites. Valley fills bury local water systems, cause land and groundwater contamination, and reduce aquatic life and other organisms (EPA 2011). In 2005, the EPA estimated that valley fills contaminated 1,200 miles of streams in Central Appalachia alone (Cordial, Riding-Malon, & Lips 2012: 202).

Air and water contamination resulting from MTR mining have material impacts on Central Appalachian health. The presence of MTR mining correlates with a reduction in overall quality of life (Zullig & Hendryx 2011). MTR mining increases atmospheric particulate matter (PM) (Knuckles et. al. 2013; Kurth et. al. 2014), which elevates respiratory problems, such as chronic obstructive pulmonary disease (COPD) (Hendryx & Luo 2014), cardiovascular disease (CVD) (Esch & Hendryx 2011; Knuckles et. al. 2013), and asthma (Kaneva 2011). MTR increases the risk of direct chemical exposure (Bernhardt & Palmer 2011), as well as other coal-based contaminants (Ahern et al. 2011)

in local water sources. Combined air and water pollution increase rates of cancer, organ problems/failure, pulmonary diseases, hypertension, skin ulcers, and birth defects (Ahern et al. 2011; Hendryx et al. 2011). MTR mining is also linked to poor dental hygiene and tooth loss (Hendryx et al. 2012). This powerful alteration is predicted to plague the region long after coal's exodus (Palmer et al. 2010).

MTR mining increases the risk of environmental and health disparities from MTR waste management; specifically, the generation and storage of coal slurry. The coal extracted using MTR mining contains impurities, such as rock fragments, soil, nitrogen, and sulfur (MHSA 2010). Coal is 'washed' using large amounts of water and added chemicals, which makes coal burn more efficiently. The 'washing' process generates a significant amount of waste called slurry (also referred to as coal refuse and sludge). Coal companies generate an estimated 70-90 million tons of slurry annually (NRC 2002: Aken et al. 2015). Slurry contains highly toxic and dangerous organic compounds, as well as high amounts of heavy metals, and is highly carcinogenic and connected to kidney disease/failure (NRC 2002). Coal companies store slurry in large ponds called coal impoundments; one impoundment can hold over a hundred million gallons. The coal industry concentrates coal impoundments in Central Appalachia (Greenberg 2017) due to the increase and prevalence of MTR mining (MSHA 2009). Appalachian writer and historian, Harry Caudill, once said these structures are "like a pool of gravy in a mound of mashed potatoes" (Erikson 1978:27).

Coal companies only paid underground miners for the amount of coal mined and often rejected coal with too many impurities. Rejecting mined coal left miners with reduced or without payment for a given day. So, underground miners took extreme care

and reduced as much waste as possible by hand in the mine (Greenberg 2017). Waste management changed with MTR mining. MTR mining increased the volume and changed the character of mining waste, making coal impoundments necessary to the process (MSHA 2009). Since workers using heavy machinery are unable to extract impurities using other methods, 'washing' became necessary. Increasing demand for purer coal also contributed to the necessity of 'washing.'

Coal impoundments gained national attention after one failed. On February 26th, 1972 in Logan County, West Virginia, 132 million gallons of coal slurry and water violently flooded the community. It "took everything in its path" (Erikson 1976) and destroyed coal-mining communities along Buffalo Creek. The disaster immediately became national news as media outlets played videos of rapidly moving water, dead bodies, and families in chaos and distress. The disaster took the lives of 125 people, injured 1,121, and left 4,000 homeless (Stern 1976). Erikson (1976) interviewed residents of Logan County a year after the event and found the disaster left people numb and in a dream-like state. All had encountered death either personally, within family, or within the community. They felt guilty knowing they were unable to protect loved ones. The disaster heightened feelings of alienation, decreased morale, destroyed cultural identity, diminished trust in institutions (including the coal industry), and increased fear.

The disaster at Buffalo Creek put coal impoundments in the spotlight. Federal investigations following the disaster found coal companies built coal impoundments without a standard, nor according to permit. More investigations found this was the norm for the construction of coal impoundments (MSHA 2009). Following Buffalo Creek, the federal government required companies to construct impoundments according to size and

stability standards set by OMSRE (NRC 2002). Despite regulatory standards, coal impoundments continue to be unsafe and fail (Greenberg 2017). Between 1972 to 2002, the National Research Council (NRC) (2002) lists nine coal impoundments failures. In 2008, an impoundment failed in Roane County, Tennessee. It covered 300 acres of land, polluted local water systems, and destroyed homes; no one was injured (Gang 2013). In 2014, another failure occurred in Eden, North Carolina and released 40,000 tons of coal ash into the community. This failure contaminated roughly 27 million gallons of water (roughly 70 miles) (Dewitt 2016).

The impacts of coal impoundment failures on Appalachian communities increase the importance of research on this topic. Existing literature is generally from engineering perspectives focused on the structure and maintenance of coal impoundments that does not examine questions of EJ. One study found coal companies place coal impoundments in neighborhoods with high concentrations of poverty and unemployment (Greenberg 2017), but literature focused on the health, social, community, economic, and environmental impacts remains limited. Literature focused on the community following the spill in Martin County found the disaster caused residents to feel excluded from decision-making (McSpirit, Scott, & Hardesty 2005), become fearful of long-term health and environmental impacts (Mcspirit et al. 2007) and distrust government agencies and the coal industry (Scott et al. 2005). Similar to Erikison's (1976) study of Buffalo Creek, these sources focused on the short-term impacts. Scott et al. (2012) looked at the long-term effects of the spill in Martin County and found the loss of trust in the industry and government institution persists. However, gaps remain within research regarding the

long-term effects, how communities respond, experience, and recover from coal impoundment failures, and the effects on local water systems.

The Persistence of Coal-Based Environmental Stressors in Central Appalachia

How did the coal industry come to leverage so much power over Central Appalachia? EJ scholars claim the existence of environmental stressors are rooted in communities' economic history, market dynamics that shape capital investment, labor control, and resource extraction (Pulido 1996; Pastor, Sadd, & Hippo 2002; Scanlan 2010). For example, market dynamics play a key role in where populations live. Cheaper housing options and land correlates with an increase in environmental stressors (Brulle & Pellow 2005; Mohai, Pellow, & Roberts 2009). Immigrating to polluted communities is often completely outside of the control of individuals. For Central Appalachia, coal-based environmental stressors exist in the form of MTR mining and coal impoundments. These persist because of deeply rooted historical inequities (Lerner 2011; Stoll 2017). The story of Central Appalachia's depression and environmental degradation dates back to the introduction of the timber industry around the mid-1800s (Caudill 1963).

The first migrants came to the mountainous region in the mid to late 1700s. People moved from north-eastern colonies to escape city life, to farm, to benefit from the vast amount of free available land, to have a more private life, to live off the land, and to be surrounded by nature (Caudill 1963; Salstrom 1994). These early inhabitants and families laid the foundations for years to come. Between the late 1700s and the mid-1880s, Appalachia was agrarian, and family was the fundamental fabric of society and

community (Gaventa 1980). Social hierarchies based on sex, race, age, personal characteristics, and family name emerged. Appalachia functioned with informal networks of bartering and borrowing and communal kinships (Salstrom 1994; Eller 1995). Bartering and borrowing began to erode from the extraction of Appalachia's abundant natural resources. Timber was the first extraction industry (Caudill 1963).

Timber extraction established the region's capitalist structure (Salstrom 1994). In the beginning, timber extraction occurred only as supplementary income to individuals and families. Selective logging did not significantly alter the region's economic structure or the environment. However, the abundance of timber in the region sparked the interest of outside investors. The influx of outside interests removed any control Appalachians had over the resource and extraction methods. Timber companies purchased land at an escalated rate, and this increased the region's population, created towns, and expanded the economy. Timber's reign lasted roughly thirty years, and by 1920, production peaked causing many companies to leave. This exodus left behind a young modernizing region without an economic base (Caudill 1963; Salstrom 1994).

Capitalism is an economic system that perpetuates economic inequality. Dating back to the 1800s, Karl Marx cautioned that capitalism inherently strips labor control away from the individual and establishes dependency upon the elite class (Worsley 1982). This remains true today, but our capitalist structure is much larger and more complex, powerful, and damaging than in Marx's day (Perrow 2002). Appalachian scholar, Ronald Eller (1982: 39) called Appalachia a "magnificent field for capitalists" due to the copious amount extractable coal in the region. Coal companies used timber's departure to their advantage because a capitalist investor was needed. Coal extraction

was initially thought of by Appalachians to benefit both the region and industry mutually. However, the industry exploited their presence and created economic inequality and environmental degradation (Eller 1982; Salstrom 1994). Thus, scholars argue that the capitalist economic structure created environmental stressors in Central Appalachia (Maxwell 2011; Sclanlan 2011).

The concept of internal colonization explains how residents and Appalachia came to be oppressed by outsiders with more resources. Internal colonization is a four-step process employed by outsiders: force entry, instill false ideologies, extract a resource, and abandon the region. Coal companies utilized their power to colonize and take over Appalachia. After their entry, coal companies instilled false ideologies of Appalachians, as a way to justify their invasion and other oppressive actions (e.g., health impacts, accidents, employment layoffs). This gave companies control over the coal and the region. Companies extract coal until it depletes and then abandons the region (Lewis, Johnson, & Adkins 1978; Bell & York 2010). The framework can be used to describe the birth of our nation when white Europeans forcefully took over Native American occupied land; it is a standard method used by oppressors (Taylor 2012).

The concept of internal colonization developed in the late 70s in response to the "culture of poverty" model; a neoliberal view that blames populations for their misfortune (Lewis, Johnson, & Adkins 1978). Internal colonization counters this model by emphasizing broader socio-historical forces in the region. It has made significant advances in Appalachian literature and remains a foundational theoretical framework within scholarship. However, the framework is problematic in its application to modern-day Appalachia. The framework focuses on the exploitation of outside interests. Some

of the most exploitive and controlling elites were born and raised in the region. The framework also leaves out the role policy and political domination play in exploitation and diminishes the importance of racial and gender discrimination (Billings 2016; Fisher & Smith 2016; House 2016). While the model is unable to explain the region holistically, it helps in understanding the presence of environmental stressors in Central Appalachia. It provides a framework to view how the coal industry has altered culture and established ideological control.

Coal's powerful and forceful alteration of culture and ideology explains the presence and continuation of environmental stressors within the region. Karl Marx (Worsley 1982) argued the capitalist structure create an underclass that possesses a false consciousness. False consciousness, to Marx, was the incompetence of the class to see their oppression, as well as the true economic, social, and political reality. Scholars have debunked this claim because it assumes minorities, those of a lower class, and women are foolish and senseless of their reality (Collins 1990; Smith 1987). However, for capitalism to thrive, elites must control and silence populations. Historically, Appalachian coal elites have achieved this control through their hegemonic power. Hegemonic power is the ability to alter values and cultural systems to coincide with another desired ideology. It has been used to make coal and culture synonymous (Gaventa 1980; Wicks 2002) and create a "coal heritage" (Lewin 2017: 2). This has also made many Central Appalachians powerless and quiescence (Gaventa 1980).

Coal ideology is created and maintained through family networks; it is a generational occupation. Appalachians can easily reference a familial connection to the industry, whether it is parents, grandparents, great-grandparents, and siblings, cousins,

aunts, and uncles (Bell & Braun 2010; Lewin 2017). This has strengthened the affection and passion people hold towards the industry. Given its tenure in the region coal has also historically played a significant role in the local economy of communities: most often, it has been the only contributor and sustainer (Kaneva 2011). Given Appalachia's distressing economic situations the coal industry is viewed by Appalachians as an essential asset in an area with a limited economy (Lewin 2017). Bell and York (2010) argue this has made Appalachians strongly identify with the industry. Coal has become ingrained into Appalachian heritage, culture, and livelihood and any attack on the industry is an attack on Appalachian communities (Lewin 2017). This indoctrination has been systematic and strategic over many decades. Strongly rooted ideologies can make unjust actions, like environmental destruction and accidents, seem normal and legitimate (Bell & York 2010; Lewin 2017).

The coal industry uses their hegemonic power to make all Appalachians, even those not employed in the industry, feel like stakeholders, or guardians of the region and industry (Lewin 2017). Environmental policy and protection threaten coal's power (Bell & York 2010; Maxwell 2011) and the industry seeks to delegitimize the strength of environmental policy through mobilizing Appalachians. Lewin (2017) conducted ethnographic work in Appalachian Shale County seeking to understand the support for coal mining. His research found residents viewed the EPA and President Obama as a threat, not only to their economy but also their community values and heritage. Residents of Shale County expressed resentment towards President Obama and the EPA; one person called President Obama "rotten to the core." Others claimed regulations make coal mining impossible. One respondent claimed President Obama favors ecology over

people, “snails and streams over backward hillbillies” (Lewin 2017: 12). Views like these are not unique to Shale County and are representative of many parts of the sub-region.

When Appalachians express extreme resentment for pro-environmental politicians, the industry wins. The industry-created organization, “Friends of Coal,” that unites Appalachians (and others) around community, further increases coal heritage. Friends of Coal, while ignoring the social and environmental impacts associated with its extraction, achieve unity by permeating the region with coal propaganda. One cannot drive through Central Appalachia without seeing “Friends of Coal” license plates, bumper stickers, and yard signs. As of September 2017, their merchandise website store included t-shirts and jackets, blankets, iPod cases, bracelets, money clips, coolers, flags, tumblers, ponchos, flasks, golf accessories, stadium seats, hats, sunglasses, grill accessories, stuffed animals, and front license plates (Friends of Coal 2017). The organization also sponsors a NASCAR driver (Blaacker, Woods, & Oliver 2012). The overuse of propaganda is a constant reminder and reinforcement of this culture, ideology, and polarizes people as supporters or opponents.

Divisions in the region impede efficient grassroots movements (Bell 2013). Marginalized communities often lack support from political institutions. EJ scholarship stresses grassroots movements as a crucial component for overcoming environmental stressors (Taylor 2012). However, effective grassroots movements sustain by communal and democratic bonds and trust. Appalachians experience family troubles, loss of community, and death threats if they dissent, resulting in weaker social connections (Bell 2013). Weak social connections between residents sustain the power of polluters (Bell

2010) and increase conflict amongst supporters and opponents of the industry. Nonetheless, literature documenting motivations for challenging the coal industry suggests they stem from a desire to protect identity, family, community, future (Bell & Braun 2010; Marshall 2010; Bell 2013) and spiritual/religious ethics (Feldman & Moseley 2003).

As Appalachians pit against one another, coal justifies its existence outside the region as essential to urbanization and modernization. Urban scholar, David Harvey (1978), argues urban areas are created, maintained, and expand from the accumulation of capital. When capital becomes over accumulated, it is reinvested back into urban locales to achieve more capital accumulation; this is a cyclical process. Over time, the process generates infrastructure, business, and amenities for urban areas. Harvey (1978) called this the urban process. Historically, the Appalachian coalfields have played a crucial role in this process as coal is essential for urban growth. The coal industry maintains dependency of urban locales on coal by sustaining the urban process with cheap energy (Cable 2010). Fueling the urban process has exacerbated inequality, established dependency, created a monopoly in Central Appalachia, and decreased economic development (Salstrom 1994).

Resource extraction, required for urban growth, occurs at the expense of Central Appalachia (Scanlan 2010; Kaneva 2011). As urban locales grow, expand, and evolve, Central Appalachian communities host coal-based environmental stressors. Environmental blackmail (Bullard 1990), environmental slavery (Wilson 2009) and environmental apartheid (Bullard 1996) are terms used to describe communities who are forced to host environmental stressors, at the expense of other communities.

Development is negatively impacted in Central Appalachia because environmental stressors deter outside economic investors (Bullard 1990; Taylor 2014). Thus, the coal industry has established a monopoly in the sub-region (Kaneva 2011; Scanlan 2010). The industry's monopoly has reduced proper infrastructure, regarding water, sewage, and roads, as well as many amenities, like food sources, industry, and health care access within the sub-region. As a result, Central Appalachians have become dependent upon coal's economic contributions.

Policymakers also influence the continuation of environmental stressors (Ikeme 2003). The coal industry attracted the attention of policymakers during its entrée to Appalachia. State policymakers view coal's presence as a significant contributor to their respective state's economy (Burns 2007; Scanlan 2010) and urban growth. The coal industry takes advantage of this. Coal executives establish relationships with local, state, and federal policymakers aimed at deterring policy initiatives that threaten extraction practices. These relationships have strengthened over decades. Today, coal is one of the most authoritative powers over the political system (Burns 2007).

Historically, the U.S. political system has favored elites at the expense of others. E. E. Schattschneider (1975) warned this would concentrate power in the political system to a small minority. Those in control over the political process are not only white elites but also leaders of political parties who decide which issues are worthy of political consideration. The coal industry funds politicians to sway the vote in their favor. For example, coal executives publicly contribute to Kentucky Senator Mitch McConnell's campaign (Goodell 2006). In coal-producing states, winning political campaigns without coal contributions is challenging. It is equally complicated to succeed if campaigns are in

opposition to the industry (Burns 2007). For example, in 2014, when Kentucky's Secretary of State Allison Lundergan Grimes challenged Mitch McConnell's Senate seat, coal mining became a political issue. During the race, President Obama proposed environmental regulations seeking to reduce carbon emissions. Both McConnell and Grimes were forced to respond to these proposals; both responded in favor of the industry. Grimes declared coal an important driver of Kentucky's economy, alongside using language detailing the severity of climate change; McConnell only used language in favor of coal mining. Even though Grimes condemned Obama's proposed regulations, her support for climate change was viewed as a threat to the industry. The industry attacked her political relationship with President Obama, as well as her pro-environmental views (Gerth 2014). On Election Day, Senator McConnell won, due, in part, to his strong patronage of the coal industry.

Another tactic employed by the industry to control policy institutions is infiltrating governments and agencies. A majority of governors of West Virginia have been coal executives, held top-level positions, and lawyers for the industry (Burns 2007). The Office of Surface Mining Reclamation and Enforcement (OMSRE) and The Mine Safety and Health Administration (MHSA), the two federal agencies tasked with overseeing and regulating the coal industry, are two agencies influenced by the industry. Politicians have chosen coal executives to work in, or head, these agencies (Gooddell 2006). This gives coal companies the ability to control policy from the inside, to push policy in their favor, and reduce fines and repercussions from disasters. For example, following the spill in Martin County, MSHA official Jack Spadaro encountered resistance from officials when he sought to investigate the company responsible for the spill.

During the investigation, Spadaro found his office demolished and documents missing. The documentary film *Sludge* documents his testimony (Sludge 2005).

Appalachians have hosted coal-based environmental stressors for over a century. The industry's duration and continuation have been strategic. These strategies include establishing coal ideology, pitting the inhabitants against one another, creating dependency, and influencing the U.S. political structure. These tactics increased the severity of coal-based environmental stressors and caused environmental and social destruction. The socioeconomic status of Central Appalachia is a product of these tactics combined. As coal is in decline, the industry's exodus from Central Appalachia is imminent. The industry's departure will further impact the sub-region because it lacks a diversified economic structure (McIlmoil & Hansen 2010). Coal ideology is expected to remain long after its departure (Lewin 2017), increasing strife in communities and political resentment. As coal ceases operations, Central Appalachia will be forced to find and develop means of resiliency.

Disaster Resiliency and Environmental Justice:

In physics, resiliency refers to the capacity of a material to bend without fracturing, as well as the speed in which it returns to normalcy (Aldunce et al. 2014: 255). Resiliency also refers to the human response following disasters (Hargrow 2013). Disasters cause communities to bend and change. Those impacted seek to reduce impacts and return to normality. Overcoming disasters, whether natural or caused by human error, is a complicated process requiring time, resources, and support. Literature focused

on understanding the resiliency of individuals and communities following disasters has received considerable attention from the social sciences.

Scholars define disaster resiliency as both an outcome or process (Gilbert 2010). Defining resiliency as an outcome assumes recovery always materializes and the resilient quality of a community rests in its ability to return to normalcy (Aldunce et al. 2014; Bergstrand et al. 2015). Scholars have challenged outcome definitions that ignores the process of resiliency (Gilbert 2010). Outcome definitions fail to recognize the complexity, multi-dimensionality, and subjectivity of disaster recovery (Cagney et al. 2016; Cutter 2016). Outcome definitions also fail to describe disaster resiliency through the lens of inequality (Bergstand et al. 2015). Disaster-based resiliency scholarship refers to the ability to overcome disasters as resilient capacity (Building Resilient Regions 2018). Resilient capacity refers to both individual's capacity and community. Disaster resiliency depends on resources, such as money, guidance, and political and communal support. Efficacy and resiliency are related concepts. How efficient those impacted are at obtaining and utilizing resources influences resilient capacity. Alongside sharing the burden of environmental stressors, marginalized communities' resilient capacity is hindered because these communities lack resources (Davidson et al. 2013; Abramson et al. 2014; Bergstrand et al. 2015; Henly-Shepard et al. 2015).

A crucial resource for disaster resiliency is political support or political capital. Political capital provides communities with direction (Gilbert 2010). Governments help reduce feelings of uncertainty by informing communities about the disaster and by directing recovery. This type of assistance helps rebuild communal functions (Aldrich & Meyer 2015) and strengthens community resiliency goals (Kennedy et al. 2013; Bava et

al. 2010). EJ literature suggests government enforcement and protection is reduced in marginalized communities (Taylor 2012). Thus, disaster relief is more accessible to affluent white populations. Government's response is quicker and more efficient in affluent white communities. The lack of support and coordination offered to black community members following Hurricane Katrina (Bullard & Wright 2009) and the water crisis in Flint, Michigan (Barry-Jester 2016) exemplifies the lack of government response in marginalized communities. A lack of government response makes disaster impacts persist and strengthens structural and institutional forms of inequality (Chamlee-Wright & Storr 2010; Bergstrand et al. 2015; Henly-Shepard et al. 2015). Residents of communities who lack political capital reported feelings of confusion, uncertainty (Gill, Picou, & Ritchie 2012) and resentment for political institutions (Cagney et al. 2016).

When political capital is absent in communities, members of communities look to one another for support and guidance. Resiliency scholarship also stresses the importance of social capital for resiliency processes (Grube & Storr 2013; Consoer & Milman 2016). Social capital constitutes a wide range of elements, and because of this, it is difficult to define and conceptualize (Cagney et al. 2015). In respect to disaster resiliency, social capital refers to anything that connects people. Even though community attributes, like the economy or politics, connect people, social capital describes networks, relationships, trust, and collective identity (Gilbert 2010; Cagney et al. 2015; Gil-Rivas & Kilmer 2016). The stronger social capital is within a community, the stronger the resilient capacity will be. Social capital is adaptable and used in many ways. Individuals look to their fellow community members for debris cleanup, economic support, food, shelter, mental support, childcare, job opportunities, home repair, and various goods lost

in the disaster. Social capital also facilitates disaster resiliency through collective narratives and community organizing (Chamlee-Wright & Storr 2011).

Community organizing, as a form of social capital, enhances resilient capacity in three ways. First, community members share information, disaster details, and recovery updates through community organizing. Social media outlets, like Facebook and Twitter, are becoming valuable information sources that facilitate disaster resiliency (Gil-Rivas & Kilmer 2016). Second, community organizing can organize disaster cleanup efforts. When political institutions are absent, individuals work together to clean up and rebuild. Lastly, community organizing is used to advocate for justice. Most often in marginalized communities, disasters are caused by unjust actions. Thus, communities organize together to fight for equitable treatment share stories and experiences with one another, establish goals, and target actions (Gilbert 2010; Cagney et al. 2015; Gil-Rivas & Kilmer 2016).

Resiliency scholarship also complements EJ literature through showing how marginalized communities adapt to disaster impacts. Adaptive resiliency refers to a type of resiliency developed by communities who lack political and social capital (Cutter 2016). This is also referred to as built-in resilience (Bosher & Dainty 2011:5). When communities lack political and social capital disaster impacts can persist long-term. Long-term exposure to disaster impacts forces communities to cope and adapt. Adaptation is more common in marginalized communities because the presence of environmental stressors increases the vulnerability to disasters. Kelman et al. (2016) suggest waiting for the next disaster is a chronic normal for many marginalized communities. Thus, adaptive resiliency frameworks consist of strategies developed by

marginalized communities to prepare for future disasters, as well as environmental stressors (Gilbert 2010).

The most prominent theme within resiliency scholarship is that resiliency is subjective and unique. The term itself is a construct emerging from contested definitions and frameworks, conceptualizations, understandings, processes, and meanings associated with it (Aldunce et al. 2014). For one, there are countless interacting systems impacting disaster resiliency (Gil-Rivas & Kilmer 2016). Each disaster will impact a community uniquely. Once disaster hits, countless factors influence the speed, in which impacts are reduced, like the racial and economic composition of the community (Cagney et al. 2016; Cutter 2016; Gil-Rivas & Kilmer 2016). Resilient capacity, political capital, social capital, and adaptive resiliency will differ across multiple settings. Therefore, it is difficult to develop a single definition of resiliency for all communities. Cutter (2016) suggests this is why resiliency is a broad term.

The subjectivity of resiliency increases the importance of research documenting the resiliency of communities. Qualitative research can directly engage with communities and examine meanings and perceptions of resiliency. This can provide insight into how impacted communities develop and use strategies. Meanings, experiences, and understandings of disaster resiliency can strengthen government agency resiliency tools and facilitate resiliency from the bottom-up. There is a lack of research that uses a grounded theoretical approach to understand perceptions and meanings communities associated with resiliency. There is also a gap in studying disaster resiliency over time.

These gaps hinder understandings of adaptive resiliency, and more specifically, how adaptive resiliency is constructed and used. Studies using a resiliency framework to study Appalachian communities experiencing environmental stressors are also scarce. This research seeks to fill these gaps. Previous research suggests the coal industry and coal ideology impedes grassroots organizing in Appalachia (Bell 2008; Bell 2010). The coal industry reduces the political and social capital of the region and hinders resilient capacity, following environmental disasters and also with improving social and economic conditions for Central Appalachia.

CHAPTER 3: THE THEORETICAL FRAMEWORK

As I discuss more in depth in Chapter 4, this research used a grounded theoretical approach. In short, grounded theoretical approaches generate theory from data. I used constant comparative methods, the act of comparing data with previous findings, to generate theory (Charmaz 2009). After analyzing my data using constant comparison methods, I referred to theoretical literature to make conceptual sense of the data. In this brief chapter, I explain my theoretical assumptions before data collection, as well as concepts I used after inductively analyzing data to help explain the emerged partial theory of resiliency presented in Chapter 8. These theoretical assumptions and concepts help explain the findings and theory.

Before data collection, one assumption of this research is reality is socially constructed. For this theoretical assumption, I use the work of Berger and Luckmann (1966). They argue reality is socially constructed at the individual level. These authors also argue the social construction of reality is a systematic process. Three concepts from this process help explain the emerged theory: habituation, institutionalization, and externalization. The systematic process begins with habituation, the process of creating habits, or repeated actions. Through habituation, individuals establish routines that become second nature. Overtime habits, repeated actions, and routines become normal. Whenever habits, repeated actions, and routines, become available to all members of society, realities constructed from habituation become institutionalized. Through

institutionalization, social actors internalize and reinforce the normality of these habits throughout society. Once realities become institutionalized, they seem concrete and objective. We, as social actors, view institutionalized realities as a priori and independent of social construction. Institutionalized realities are thus continually reinforced through externalization, the process of externalizing "objective" realities onto others. Berger and Luckmann suggest we continually externalize institutionalized realities to others within society and even future generations. Over time, the social process of habituation, institutionalization, and externalization creates and strengthens many social realities.

After collecting and inductively analyzing data, I used theoretical concepts/themes from social movement literature to interpret the emerged theory. First, I use McCarthy & Zald's (1977) concepts of constituents, adherents, and bystanders to discuss levels of participation in a social movement. Constituents are individuals who provide resources for a social movement, such as money, direction, information, and organization. Constituents also lead community interactions. Adherents believe in the goals of the movement, but do not provide resources. Constituents are also adherents, but the two differ on which provides resources for the movement. Lastly, bystanders are neither opponents or supporters of the movement but only observe movement activity. Bystanders also may or may not directly benefit from social movement goals. From this categorization, constituents have two goals with respect to recruitment. The first goal is converting adherents into constituents. The more constituents in a social movement translate to more resources. The second goal is converting bystanders into adherents. More adherents increase the size and strength of a social movement (McCarthy & Zald 1977).

The second concept I used from social movement literature is framing. Framing is how constituents create meaning and a shared understanding of the movement. Thus, adherents and potential adherents, like bystanders, join social movements because of shared understandings and meanings (Benton & Snow 2000). The third concept from social movement literature is political opportunity. Political opportunity refers to any social factor that hinders or influences movement mobilization (Meyer & Minkoff 2004). The last social movement concept is micromobilization. A social movement refers to any organized collection of individuals focused on social change (Tindall 2004). The concept micromoblization refers to the building blocks or processes that move a social movement forward. Generally, micromobilization refers to social settings or small groups of individuals that provide avenues and sources for group interaction. Group interaction is crucial for social movements because interactions facilitate goals, communication, help social movements gain traction and recruit new members (Ward 2015; Bell 2016). Through group interaction micromoblization transforms personal problems into connected, communal problems (Ward 2015; Bell 2016).

Alongside social movement concepts, I also used the concept hegemony to interpret the emerged theory. As I discuss in the literature review, hegemony refers to one's ability to alter values and cultural systems to coincide with another desired ideology (Gaventa 1980; Crehan 2002). When those in power have hegemonic power, they have the power to shape and frame ideological elements. Thus, they have the power to frame and construct social reality. Over time, frames created by those in power become normal. However, individuals from the bottom up can create counter frames. Counter frames challenging the constructed frames by those in power (Benton & Snow

2000). Gramsci called those who create counter frames organic intellectuals. He conceptualized organic intellectuals in response to Marx's claim that intellectuals, or those with resources, can only challenge power structures. Gramsci challenged Marx and argued anyone can counter frame hegemony from the bottom up (Crehan 2002).

The concepts presented in this chapter informs the emerged theory in Chapter 8. The next chapter concerns the methodology for this project. However, before discussing the methodology of research, a brief discussion of the research goal is presented. This research sought to understand the resilient capacity of Martin County, Kentucky following the spill and the ongoing water quality crisis. More specifically, questions of focus were:

- What resources did the community use to recover?
- What role did political institutions play?
- What role did the community play?
- What role did the coal industry play?
- Is adaptive resiliency present in the community?
- What are their experiences with living with environmental stressors?
- Did coal ideology play a role in resilient capacity?
- What are the perceived solutions to fixing these issues?
- What role does living in Central Appalachia play in their resilient capacity?

In answering these questions, this research sought to fill gaps in disaster resiliency scholarship by using grounded theory methods, inform literature on the impacts of coal impoundments, and discover the long-term impacts of the spill in Martin Co.

CHAPTER 4: THE METHODOLOGY

I wanted to understand residents' constructed meanings, understandings, and perceptions associated with their resiliency process following the spill. To do this, I used a constructivist approach that takes inspiration from Berger and Luckmann's (1966) work that focused on how we, as humans, socially construct our reality, as well as perceptions and meanings towards the social world. However, I must further clarify my constructivist approach. My constructivist approach for this research is not a strict constructivist approach that assumes social construction is independent of the social world (Best 2007). Scholars have critiqued strict constructivist approaches for ontological gerrymandering or conducting constructivist social research without acknowledging objective reality (Woolgar and Pawluch 1985). My approach, however, is a contextual constructivist approach that acknowledges objective conditions and its influence on constructions of reality. Thus, contextual constructivist approaches seek to link everyday realities to objective social problems (Best 2007). For this research, I acknowledge objective social problems, such as the socio-economic status of Central Appalachia and the environmental/health impacts of coal extraction. I also acknowledge concepts from non-constructivists, like Gramsci's concept of hegemony, to link prior work on objective social conditions to subjective understandings of the social world. Thus, I sought to understand the manner in which social constructions of reality

associated with resiliency emerge within the context of objective social problems and conditions.

The inspiration for taking this approach came from the gap in resiliency scholarship to study the socially constructed meanings, understandings, and perceptions associated with resiliency processes. Another inspiration for taking a constructivist approach came from the gap in the literature on the spill in this community. Our understanding of the Martin County community following the spill is limited to a few studies (McSpirit et al. 2005; Scott, McSpirit, & Hardesty 2005; Mcspirit et al. 2007; Scott et al. 2012), the documentary *Sludge* (2005), and various newspaper articles. This gap in information further limits our understanding of Martin County's resiliency process following the disaster. This research sought to strengthen our understanding of the spill by focusing on how this community perceived and associated meanings towards their own resiliency process.

To do this, I used grounded theory methods that inductively generates theory from observational data (Glaser & Strauss 1967; Bailey 1999: McCallin 2003; Charmaz 2009; Bailey 2017). More specifically, I used a constructivist grounded theoretical approach, which uses grounded theory methods in concert with a constructivist approach (Charmaz 2009). Constructivist grounded theoretical approaches are applicable for researching untouched social phenomena from the perspective of individuals. To do this, grounded theory methods afford the researcher the ability to have an open-ended design, creativity, adaptability, and change throughout the research process. Change can occur in forms of data collection and research focus. Since our understanding of resiliency following the spill is limited, I wanted to give residents included in this study the power to discuss

topics, aspects, and details they thought was most applicable to their community. In other words, I wanted residents to guide the research process.

The choice to use a constructivist grounded theoretical approach also came from the influence of Patricia Hill Collins (2009) and Dorothy Smith (1987). These influential scholars used grounded theory methods to unearth constructions and meanings of oppression at the intersection of race, class, gender, and sexuality. Collins (2009) and Smith (1987) argue theory should emerge from the perspectives of those oppressed. Smith refers to this as a standpoint perspective. Constructing theory from a standpoint perspective can empower individuals, raise individuals' consciousness, challenge oppressive institutional processes, and insight societal change. I not only wanted to use a constructivist grounded theoretical approach to guide the research process but also wanted the emerged resiliency process to be from residents' own standpoint perspective. As resiliency is a subjective process (Cagney et al. 2016; Cutter 2016), I wanted to give residents of Martin County the power to tell me their standpoint perspective of resiliency following the spill. To capture their standpoint perspective, I used qualitative methods.

Before I discuss which qualitative methods I used, I want first to discuss which grounded methods I used: constant comparison and theoretical sampling. Constant comparison is the act of generating theory alongside data collection, not necessarily at the end of the research. Generating theory alongside data collection through constant comparison gives the researcher the ability to reflect on prior data, form and reform concepts/themes of the developing theory and find new avenues of data collection (Glaser and Strauss 1967; Charmaz 2009). Theoretical sampling selects subjects based upon the evolving themes that emerge from data and gaps from the research (Hesse-Biber and

Leavy 2012). Theoretical sampling gives the researcher the ability to fill unanswered gaps and guide the research to ask and answer new questions. Constant comparison and theoretical sampling give the researcher flexibility in their research. These two approaches shifted and transformed research questions, research focus, whom I interviewed, and avenues for data collection.

To capture meanings and perceptions of the county's resiliency process I began this research with semi-structured interviews with Martin County community members. The interviews were structured but flexible given the conversation. Interviews were structured around resiliency as a sensitizing concept. In grounded theoretical approaches, sensitizing concepts are concepts that inform, guide and organize research design. In other words, sensitizing concepts serve as a starting point for qualitative research using grounded theory methods (Charmaz 2003). For this research, disaster resiliency served as a sensitizing concept that guided semi-structured interviews and research focus. To do this, I began interviewing residents about personal experiences, individual and community impacts, barriers encountered, continuing impacts, and preparedness for future disaster. From these topics, I expected to learn what populations were impacted, how those who were not impacted perceived the spill, whether the coal industry and political institutions influenced their resilient capacity, if residents perceived long-term impacts of the disaster, and if the community felt prepared for another future. See the appendix for interview topics.

I started data collection with an individual I knew from the county, a gatekeeper who had access to a certain population (Barbour 2013). Following the interview with the gatekeeper, I used snowball sampling, a method where the researcher asks each

respondent to provide names and contact information for other respondents (Hesse-Biber and Leavy 2011), to find more residents of Martin County. So, I asked the gatekeeper to provide me with 3-5 names of residents who could best speak about the spill. After calling his references and interviewing these individuals, I went back through the data and used constant comparison to find who next to interview, as well as what components of resiliency were most important to this community. Two keys themes emerged following these interviews: the localized aspect of the spill and the water quality crisis.

Concerning the spill, the first emerged element of resiliency following the spill was the localized nature of the spill. More specifically, slurry released from the impoundment only entered into two residential hollows: Coldwater and Wolfcreek. The rest of the community was not physically impacted by slurry. So, through constant comparison, I decided to reach out to residents of these residential hollows. I then asked respondents to provide me with names of residents from these residential areas, as a way to discover experiences of those directly impacted. As I called references from Coldwater and Wolfcreek residents, they either hung up on me, stood me up, canceled interviews, never answered my calls, or refused the interview altogether. Individuals included in this study told me this population of Martin County signed waivers with the coal industry following the spill prohibiting them from speaking about the disaster. As a result, only one individual included in this research was directly impacted by the spill.

I soon realized this research would not capture voices of those directly impacts. I then went back through my data and determined the best sources of information were those who lived outside of Coldwater and Wolfcreek. So, I continued to theoretical sample by asking previous respondents for names of community members who knew the

most about the spill. More specifically, respondents referred residents based upon their knowledge of the spill, not necessarily if they were impacted. Many of their references also refused an interview because this research focused on a coal-based disaster. These individuals told me they would never speak badly about the coal industry and refused to talk. Given the strong support for coal mining in Central Appalachia, I felt Martin County residents were a difficult to reach population. However, respondents also referenced residents who were not afraid to speak out. Literature suggests power structures suppress voices in Central Appalachia. Thus, vocal individuals are unique and rare (Bell & York 2010; Bell 2013). Those included in this study felt they were unique in their community because they were not afraid to voice concern and be interviewed. In other words, they believed they were a minority of the majority in Martin County. Despite power structures in Martin County, these individuals agreed to discuss details about the slurry spill.

The second emerged theme that guided this research was the water quality crisis. Following the first interview, I learned about the water quality crisis in Martin County. This was a problem I was unaware of before this interview. As I continued to theoretically sample individuals based on their knowledge of the spill, the water quality crisis continued to emerge. After the fourth interview, I used constant comparison of previous data and determined the water quality issue was a paramount contemporary issue in Martin County. Thus, I changed my research focus on studying resiliency following the spill and the water quality crisis. Alongside asking respondents to reference individuals about the spill, I asked them to do the same with the water quality crisis. I was referenced to individuals that were deemed by others to be experts on the

issue. Some were described as activists and others were deemed extremely knowledgeable of the issue. As I called references, I indicated that I was studying both the spill and the water quality crisis. All individuals were willing to have a dialogue about both, even if they were unable to talk in depth about the spill; everyone talked in depth about the water. In all, theoretical sampling assisted in finding individuals who helped emerge the resiliency process of Martin County following the spill and the water quality crisis.

The water quality crisis in Martin County not only restructured the research focus but also prompted new avenues for data collection. Constructivist grounded approaches stress the importance of finding new avenues for data collection, when necessary (Charmaz 2009). Following the third interview, I learned from a respondent that a small group within the county formed the *Martin County Concerned Citizens*: an advocacy group formed in the spring of 2017 to organize community response around water quality. The *Martin County Concerned Citizens* hosts meetings periodically to strengthen grassroots initiatives. I refer to these in the following chapters as water meetings. After the third interview, I decided to attend these meetings and take observational notes to add more data to this research. I noted the number of people in attendance, the nature of the meeting, topics discussed, and community statements. I later discovered that the first meeting I attended was the *Martin County Concerned Citizen's* third meeting; the first two occurred before data collection. I continued to attend every water meeting held during the year of 2017. In all, I attended a total of four water meetings. The first one was held at Pidgeon Roost Park on July 7th, and a total of 41 residents attended. The second was at Warfield Park on August 10th, and a total of 20 residents attended. The

third was held in the Roy Collier Community Center in Inez on August 29, 2017; the Public Service Commission and Division of Water came to receive formal testimony. This meeting attracted 109 residents of Martin County. The fourth and last was held on September 20th downtown Inez, Kentucky and 28 residents attended. All meetings were hosted by the *Martin County Concerned Citizens*, except the August 19th meeting. This meeting was hosted by the Public Service Commission and Division of Water. Even though the *Martin County Concerned Citizens* did not host this meeting, they spread the word around the community by hanging fliers around town and posting the event on Facebook pages.

Data collection occurred during the months of June-November of 2017. I conducted a total of 22 semi-structured interviews with individuals from Martin County, Kentucky and observed four public community meetings about water quality. Interviews were recorded and transcribed using REV transcription service. Individuals were given an informed consent form to sign, detailing the purpose of this research, as well as their formal agreement to be included in the design. Included in the consent form was language indicating that their name will be removed to protect their confidentiality. For the sake of their confidentiality, I have given each respondent a pseudonym in the following chapters. Inspirations for pseudonyms came from names of Central Appalachian counties. I also asked interview respondents to complete a brief survey. The survey asked their age, sex, educational attainment, race, employment status, marital status, number of people living the household, years lived in Martin County, place of birth, income, and personal/family employment in the coal industry. A copy of the

survey is presented in the Appendix. The demographics of those interviewed are presented in *Table 1. Demographics of respondents.*

Table 1. Demographics of respondents

Name	Age	Race	Sex	Education	Years in Martin County	Employment	Income
Elliott	31	White	Male	Advanced Degree	18	Full time employed	$60,000-69,999
Floyd	61	White	Male	Advanced Degree	61	Retired	$40,000-49,999
Morgan	59	White	Female	Advanced Degree	41	Retired	$40,000-49,999
Coosa	66	White	Female	Less than High School	66	Retired	$0-9,999
Lee	64	White	Male	Some college, no degree	30	Full time employed	$30,000-39,999
Perry	66	White	Male	Advanced Degree	66	Retired	$90,000-99,999
Clay	65	White	Male	Advanced Degree	65	Retired	$30,000-39,999
Whitley	31	White	Female	Less than High school	31	Unemployed	$0-9,999
Russell	29	White	Male	Bachelor's Degree	29	Full time employed	$30,000-39,999
Wayne	76	White	Male	Advanced Degree	55	Retired	$40,000-49,999
Grant	62	White	Male	Advanced Degree	14	Retired	$50,000-59,999
Casey	55	White	Female	Advanced Degree	8	Retired	$50,000-59,999
Brooke	55	White	Female	Advanced Degree	50	Retired	$90,000-99,999
Leslie	57	White	Female	High School Degree, or Equivalent	57	Other	$40,000-49,999
Clark	65	White	Male	Advanced Degree	40	Retired	$50,000-59,999
Rowan	49	White	Female	Bachelor's Degree	15	Retired	$10,000-19,999
Lewis	58	White	Male	High School Degree, or Equivalent	58	Disabled	$10,000-19,999
Madison	N/A	White	Female	N/A	N/A	Full time employed	N/A
Taylor	47	White	Female	Advanced Degree	17	Full time employed	$40,000-49,999
Perry	53	White	Male	College degree	35	Full time employed	$40,000-49,999
Estill	N/A	White	Female	N/A	N/A	Full time employed	N/A
Roane	44	White	Female	Advanced degree	N/A	Full time employed	N/A

Age of respondents ranged from 29 to 76; the average age was 59. All respondents were white; 11 males and 11 females. As respondents were unique, and not

afraid to voice concern, these individuals were not representative of the county. A majority of these individuals were teachers, a common profession in the county and thus, a majority of these individuals also held an advanced degree. The majority of these individuals reported their household income as $40,000-49,999. In Chapter 7, findings suggest that resiliency and voicing concern is a privilege within a marginalized community. Thus, their reported household income and educational attainment were higher than the rest of Martin County; $29,052 and 3.9 percent, respectively (U.S. Census Bureau 2016d). Most were retired, suggesting they had time out of their day for an interview. Fourteen interviews were conducted in their homes, local restaurants, the Inez library, a school, a church, or at a regional newspaper. Eight were conducted over the phone. For over the phone interviews, informed consent forms were sent in the mail. Interview time ranged from 45 minutes to an hour and a half.

Interviews with residents concluded following theoretical saturation. Theoretical saturation is the point in research when the researcher hears the same continual themes (Hesse-Biber and Leavy 2012). After the last interview, I hit theoretical saturation because I continued to hear the same themes of resiliency following the spill and the water quality crisis. I also reached sampling saturation. Sampling saturation is the point in research when the researcher is unable to sample any more individuals (Hesse-Biber and Leavy 2012). As all interviewed in this research were vocal individuals, they told me being vocal in Martin County is rare. Throughout the sampling process, I continually received the same names of individuals. Residents interviewed knew whom the vocal residents were in the county and continually referenced to the same people. I felt those included in this research were a minority of a larger majority in Martin County.

Reaching sampling saturation with 22 interviews further supports the claim that only a small population of Martin County were vocal.

In respect to data coding, Saldana (2013) suggests coding is unique and depends on the qualitative project. Where this project used constant comparison to compare previous data with new data, my coding process was cyclical. More specifically, I manually coded interviews and observational data throughout the entire research process. I constantly coded and recoded interview transcripts and observational notes into themes, patterns, and concepts to organize interview and observational data. My approach to coding best fits the concept of theoretical coding in Saladana's (2013) coding manual. Theoretical coding is frequently used alongside constructivist grounded approaches using constant comparison and theoretical sampling (Hesse-Biber & Leavy 2012). Theoretical coding begins with finding core categories or primary themes of the research. From core categories, data is grouped according to categories and sub-categories within core categories.

After the first interview, the respondent spoke about the spill, the water, and the future of Martin County. So, I created three core categories: the spill, the water, and the future of Martin County. Then, I then went line by line in the transcript and further categorized data according to the spill, the water, and the future of Martin County. I then grouped the data according to sub-categories based on themes. I continued to do this same process after each interview. All interviewees talked about the spill, the water, and the future of Martin County. Once I began attending water meetings, I noticed individuals who attended talked about the water quality crisis and the future of Martin County. I also categorized and sub-categorized observational data according to either the

water or the future. However, I did not code each interview or observational data independently. I used constant comparison and continually grouped interview and observational data with previous interviews and observational data. This cyclical process afforded me the opportunity to recode categorizations and sub-categorizations within the three distinct parts of interviews and observational data. Once I concluded data collection and went line by line in interviews and observational data, all data collected were grouped into three core categories: the spill, the water, and the future of Martin County. The core category of the spill, data were categorized according to the day of, the days following, the government response, the power of coal, and the memory of the spill. Sub-categories were used under each category to tell a linear story of the spill from residents' perspectives. The core category of the water, data were categorized according to experiences, infrastructure, local government, and grassroots organizing. Sub-categories were used under each to best group feelings and experiences concerning each category. Lastly, the core category of the future of Martin County, data were categorized according to the economy and health. Thus, sub-categories were used to best group feelings and experiences concerning each category. The three core categories became Chapters 4, 5, and 6. The categories within each core categories became headings within each chapter.

Another methodological component of this research study concerns the use of a literature review. Scholars disagree on the appropriate use of a literature review in studies using grounded theory methods. Glaser argues literature reviews should be completed after data collection because literature can contaminate the natural emergence of theory. On the other hand, Strauss and Charmaz argue literature reviews should be

used to guide the research project. More specifically, the literature reviews should change and evolve alongside collection (Charmaz 2009). For this project, I wrote the literature review alongside data collection, not after. I wrote the section of resiliency before data collection. I did this because I used it as a sensitizing concept for this research. However, the EJ and Appalachian components of the literature were written alongside data collection. I did this because I wanted to ensure literature themes were representative of the emerged themes from the data. In other words, the creation of the literature review was inductive and changed, evolved, and transformed given emerged themes of the data.

The last methodological component of this research is my background. Lemert (2012) claims that since sociologists study "social things," researchers can never escape values in research. Values impact the entire process, from literature, collection, interpretation, and dissemination. Therefore, I took Feyerabend's (1993) advice and embraced values, instead of hiding them. I am from Central Appalachia; three counties north-west of Martin County. There, I witnessed the environmental, health, and social impacts that coal mining has had on the region first hand. I have always viewed the spill in Martin County as an injustice. I approached individuals with these values, as I did not want anyone to get the wrong impression and goal of this research. The fact that I am from Central Appalachia and my last name is Sizemore helped me gain entrée into the community. The Sizemore family was one of many founding families of the Appalachian region (Caudill 1963). Many residents of Martin County heard my last name and immediately knew I was from Central Appalachia. Given my Appalachian heritage, I would often sit with many of individuals and discuss Appalachian life and issues before

starting the interview. This established trust between myself and respondents. Constructivist grounded approaches welcome this relationship building because it helps co-create the research process (Charmaz 2009). The next three chapters present the data obtained from respondents and observations at water meetings.

CHAPTER 5: THE SPILL

This chapter tells the story of the 2000 Martin County coal slurry spill as described by community members during interviews. The events that unfolded the day of, days that immediately followed and the subsequent months and years after influenced the way individuals perceived the disaster. These events influenced the way residents' experience, narrative, and emotional responses to the impact and recovery related to the spill. This chapter begins with the day of the disaster. Elements of this day shaped the knowledge of the spill and actions of community members. Then, this chapter discusses how the events that occurred in the following days, weeks, and months influenced feelings towards government agencies, the coal company, and those directly affected by the spill. It ends with a discussion of the perceived long-term impacts.

The Day of:

As with most mountainous areas, hollows (or "hollers)," valley-like areas created in between mountains, became attractive places to settle for early inhabitants of Appalachia. Hollows remain common places to dwell, often with deeply rooted historical networks and lineage (Stoll 2017). When the coal impoundment in Martin County ruptured, contents made its way into two residential hollows: Coldwater and Wolfcreek. Coldwater and Wolfcreek sit opposite of one another in the central part of the county; Coldwater extends north towards the county seat Inez, Wolfcreek extends south towards

Warfield. See Map 5 *Coldwater, Wolfcreek, and Tug Fork River, Martin County, Kentucky* below. Near where the two hollows meet, the *coal impoundment* failed to hold its contents.

Residents said in the middle of the night, the coal impoundment ruptured and released 300 million gallons of slurry into Coldwater and Wolfcreek. The majority of thick black slurry entered into Coldwater, whereas black water-like material entered into Wolfcreek. Respondents said Coldwater's impacts were more severe than Wolfcreek. Slurry remained localized to these hollows and did not infiltrate other hollows, neighborhoods, or other towns in Martin County. The coal company that owned the impoundment, Martin County Coal Company (MCCC), mobilized into the hollows quickly the day of the spill to start the cleanup process. Community members recounted seeing heavy machinery going up and out of these hollows throughout the day. One described the machinery as "*vacuum trucks*," or trucks with long tubes used to absorb slurry. MCCC also assisted whoever needed it in Coldwater and Wolfcreek. Proximity to the impoundment corresponded with an increase of slurry. Those who lived closer to the mouth of the hollow got the least amount of slurry. For homes surrounded by slurry, MCCC accommodated these individuals and housed them in various hotels outside of Martin County. As Coosa said, "*they come through and evacuated them*."

The news of the spill quickly circulated within the community. Individuals reported receiving phone calls from friends and family, hearing it on the radio, and hearing it from fellow community members downtown; all indicating the severity of the spill. According to Russell, *"it was the general buzz of the community. It was the biggest thing that had happened to us, in my lifetime, and most people's lifetimes"*. Even

though news spread quickly, many reported feelings confused that morning, as concrete details of the spill were unknown. The confusion stemmed from the localized nature of the spill. Because only Coldwater and Wolfcreek were impacted, the rest of the community made assumptions about what had happened. Confusion attracted community members to the mouth of the hollow for answers. Half of the 22 respondents reported going to Coldwater that afternoon to seek information. Upon their arrival, each of these individuals said they encountered a barricade, which MCCC used to close off the only entrance to the hollow.

Despite hitting the barricade, four of these individuals could go beyond. This was due to their connections to the community. As social capital constitutes networks and relationships (Gilbert 2010; Cagney et al. 2015; Gil-Rivas & Kilmer 2016), individuals utilized theirs to acquire information about the disaster. For example, Floyd knew the Sheriff on a personal basis and thus rode with him to the end of the hollow. He said, "*since I was with him, I could go beyond the barricade*." The remaining three said their employment in various newspapers gave them the power to travel beyond and send reporters up Coldwater. Newspaper outlets ranged from local, state, to national. One respondent, Lee, recalled asking fellow reporters to go up Coldwater and find answers. He said:

> I remember just coming to work, and I got here, and I heard one of the reporters here talk about that they had a huge spill. I told the [reporters] to run up and get some photos of it. I really didn't know what happened. Later on, we learned the magnitude of how bad it was.

Those who traveled to Coldwater without personal connections got out of their car and walked beyond the barricade. All who traveled beyond described seeing black as far

as the eye could see. Everything, including homes, was jet black. Creeks were brimming with slurry, as countless fish were jumping alongside the banks seeking refuge from the slow-moving *slurry* approaching from upstream. The only way to know where the creeks began and ended was being familiar with the land, before the spill. There was also an insufferable smell that caused eyes to burn. Phrases and words, like *"volcano-like," "black lava," "a sea of pudding," "oily," "a tributary of chocolate pudding," "tar,"* and *"shit"* were used to describe what they saw. They reported feeling *"scared as hell,"* "*their heart dropping," "shocked*," and "*stunned*."

Wayne, another reporter, went beyond the barricade seeking photos for his newspaper. While in Coldwater, he recalled approaching a basketball goal. Wayne measured the basketball goal and determined it was regulation height (10 feet); slurry covered 7 feet of the goal. He left with three photos: the goal, a stick standing straight up in slurry, and a frog sitting on the creek bank coated in slurry.

Over in Wolfcreek, residents experienced similar, yet reduced impacts. Lewis, the only respondent, directly impacted described his experience that day:

> It was in the creek right here in front of the house. The one who got it the worst was Coldwater. Over here, I mean you never had a creek. It was all level with nothing but sludge. The impoundment broke, it wasn't fixed properly, and it blew out and it shocked the water streams and everything. I mean it devastated people's places. MCCC had big pumping trucks up here, and at Coldwater. It filled up the creeks plum up. It filled them level with the road. It was noticeable. Everybody and anybody, you couldn't even go to Coldwater. If you were on the ground and able to walk around the hills, look at it, you could see the devastation.

Those directly impacted, those who utilized networks, and those who walked beyond the barricade were reported as the only community members who saw the spill's effects. Thus, detailing descriptions of the spill rested in the hands of those who traveled

to Coldwater. However, their descriptions were only visual depictions. Answers to why it happened and how long it would take to clean up were still unanswered, as MCCC left the rest of the community in the dark. Respondents did not report seeking answers from Wolfcreek, mainly because impacts were less severe. Coldwater received all of the attention.

The isolated nature of the spill, the physical barriers to the sites of destruction, and lack of access to information kept the community from fully understanding the spill. This suggests Martin County residents lacked social capital needed to understand the spill. However, individuals were thankful and felt fortunate the spill was localized because it significantly reduced the severity of the spill. One, in particular, was Lee, who lived through the Buffalo Creek disaster and witnessed the destruction firsthand. As he and his grandmother were escaping the disaster, he recalled feeling scared. He continually reaffirmed the spill in Martin County was not comparable to Buffalo Creek and many in Martin County knew what happened at Buffalo Creek. Thus, Lee expressed gratitude that the spill was not as destructive as Buffalo Creek. He said the Martin County community also understood the disaster could have played out completely different. In his words, "*if it had hit Inez, it would have been devastation."* All the community wanted were answers.

The Days Following:

In the days following, MCCC progressed with the cleanup, Coldwater continued cut off, and the community remained uninformed. Even though downtown became tranquil during this time, the community, needing answers, became agitated. Community

members described three things that escalated their agitation: a lack of information, the unexplained lengthy school closures, and word of private meetings between Coldwater residents, MCCC, and government agencies. Respondents only heard disaster details from news sources, which they criticized because they wanted direct information from the community, MCCC, and government agencies. The predominant source of knowledge was *The Herald-Leader* newspaper of Lexington, Kentucky. Respondents said *The Herald-Leader* compared the spill to the Exxon Valdez Oil Spill, showed many aerial shots of Coldwater, and discussed the intensity, the magnitude, and the severity of the spill. For many, seeing aerial shots in the news was their first time seeing the destruction. According to Morgan, "*when you see it in the Lexington Herald, you know it's serious*." However, respondent Lewis said "*the aerial shots do not do it justice. If you was on the ground, look at it, you could see the devastation*".

The uncertainty surrounding school's closure increased anxiety. Five respondents were teachers during this time, and two were students. These individuals were unable to provide an exact timeframe of how long schools were closed, but they estimated it was around a week. Even on the day of the spill, respondents were unaware of exactly why schools closed in the county. The teachers remembered receiving a call early in the morning of October 11th indicating schools were closed due to some spillage. This was all the information they received. As the schools continued to remain closed, suspicions and speculations about the true nature of the spill in Coldwater heightened. Respondents said they later found out slurry compromised water lines and the county closed schools to ensure students did not drink contaminated water.

Respondents said finding out about private meetings between industry, government, and Coldwater residents in the days following increased their agitation. Coldwater residents were the first to receive answers about the spill. Respondents reported MCCC chose to hold private meetings with these individuals in various churches in Coldwater. This suggests residents continued to lack forms of social capital. The rest of the community was not invited, nor allowed to attend. Little was known about the agenda of these meetings, and many of those interviewed said this further increased agitation. While the community's questions multiplied, Coldwater residents got theirs answered. Some of the teachers discussed having the opportunity to talk to students from Coldwater when school reconvened. One conversation, in particular, stuck with Morgan. According to her,

> One boy raised his hand in my class and said, 'Mrs [redacted], An official from the EPA told my family not to worry about the sludge because there isn't anything in that sludge that isn't on the periodic table of elements

Respondent Russell, a middle schooler at the time, spoke about being in the classroom. He stated:

> I remember being flabbergasted when I heard this. I mean, my god, there's everything in the world on the periodic table. I mean, uranium's on the periodic table! Some of the worst things we can think about, stuff that nuclear bombs are made of! I remember thinking 'I know everything on the periodic table is not healthy for the human body. So, the creeks having all that stuff it can't be good'. That's all I could think about! I remember that's always stuck with me. I have never forgotten that.

Teachers also reported feeling disconnected from other teachers who lived in Coldwater when school reconvened. Teachers from Coldwater remained quiet, did not speak of the spill, and went about their school day as normal. Respondents not in the

school system also reported a similar disconnect from Coldwater residents. Some remembered calling Coldwater residents, but they never returned their calls. At this time, many community members were still unaware of what happened. Apprehension transformed into mistrust. At this point, it had been a little over a week. Martin County residents continued to demand answers.

The Government Response:

As Martin County residents continued to lack forms of social capital, they also lacked forms of political capital. More specifically, they said the EPA failed to respond effectively to the disaster. When the EPA came to Martin County, the EPA and MCCC hosted a community meeting for all Martin County, not just those in Coldwater. Respondents disagreed about when the meeting was held; some said it was weeks after the spill and others said it was months after the spill. According to respondents, this meeting, held in the gymnasium of the high school, attracted roughly 250-300 community members. Thirteen individuals included in the study attended and said MCCC executives and EPA folks sat at a table on the gym floor, while the community sat in the stands. They said MCCC executives remained quiet and did not speak, as EPA officials did most, to all, of the talking. They also described the EPA as rude and abusive. One respondent remembered someone from the EPA telling the crowd that these types of disasters are normal for coal mining communities and, as one respondent said, "*face the music*." These statements made the crowd irate. Respondents said it felt like the EPA was trying to silence the community. According to Floyd,

> It was as if they were looking at us and saying 'you dumb ass hillbillies'. I feel like they can do this, corporations can do this to Eastern Kentucky and to Appalachia because they've always fucking done it to Appalachia. It's

> just like you go to Chicago, where do they put the coal-fired power plants? You know, in the poor neighborhoods. 'Let's kill those Hispanics and Blacks. We don't care about them'. They don't care. It is basically discrimination. They kept comparing it to Buffalo Creek and diminishing the severity of it. You're comparing Martin County with West Virginia. You got to compare Martin County with Martin County.

Many felt the meeting was held to only calm apprehension. The EPA provided limited answers to community questions concerning the causes of the disaster, the clean-up process, and the environmental/health impacts. The day after the meeting, residents found out the EPA began operating on MCCC property. Little was known about what they were doing. As EPA representatives remained at MCCC, the EPA sent one individual to the county courthouse to serve as the liaison between the community and the disaster. The liaison was a young black woman. Respondents claimed this was a tactic by the EPA to reduce community questions. According to Morgan,

> Well, first of all, there are no black people here. I don't mean to be racist, but honestly, people probably would [be racist]. First of all, she's a lady. They're not going to talk back to her. All she would say is 'Here's what we have. These papers'. I would go in and I would say 'What have you got?'. It would be the same papers, the same papers I picked up there prior. My point is that none of the people who worked on this ever came and talked to the people about how they felt about it. This woman didn't take your questions. She didn't give you any answers, she didn't write down how you felt that day. All she did was hand out papers. Basically, the only people that the EPA ever heard from were the bosses at the mine.

Interviews said alongside the EPA, there were other government agencies in Martin County. The EPA's presence was known; no one disputed this. However, community members disagreed about the other agencies; respondents reported: The Mine Safety and Health Administration (MHSA), The National Guard, The Red Cross, The Division of Water, and The Safety and Health Administration. Two respondents said

they did not see any outside government support besides the EPA. The conflicting reports can be explained by two factors. One, the EPA was the only agency to directly reach out to the community. Even though their outreach was critiqued, other agencies failed to engage directly with the community. The second reason was the localized character of the spill. If agencies came to Martin County in the days following community members remarked there would be no way of knowing they were there. They suspected their destination was either MCCC property or Coldwater. Those who reported seeing officials from other government agencies remembered seeing them for a short period; many were unable to provide concrete examples.

Respondents said the isolated nature was an opportunity for MCCC and the EPA to hide what happened. This gave them the ability to keep a low profile and withhold various details of the spill. Thus, respondents deflected blame to the EPA because they made their presence known. Respondents spoke of historically distrusting the agency due to its overuse of environmental regulations; this is a documented perception across many coal mining communities (Lewin 2017). Feelings of resentment for the EPA existed before the spill within the community and strengthened after officials spoke down to them. It was easy for them to blame the EPA. The combination of tactics used by MCCC and the EPA made individuals feel the spill was a conspiracy. Individuals felt confident that the EPA and MCCC were working together to cover up the spill, at the expense of the community. One respondent described this relationship, as not unique to the spill, but a reality of living in coal country. She said,

> It is what you call regulatory capture. Basically, the coal industry don't have to worry about the EPA because they've got them. You expect this from the coal industry, you don't expect it from government agencies.

The Power of Coal:

This perceived relationship demonstrated the power of, not only MCCC but the coal industry in general. Many residents blame the coal industry for hindering their resilient capacity. More specifically, their capacity to utilize effective political capital. Respondents felt the regulatory capture of the EPA had two primary goals. The first was to reduce the penalty for the disaster. The second was to divert attention away from MCCC and put the EPA in the spotlight. As this is a common tactic employed by the industry across Appalachia (Burns 2007), many felt it was used to diminish the importance of the spill, alongside maintaining MCCC's status in the community. Isolating to Coldwater, MCCC reinforced coal ideology, strengthened the animosity towards government institutions, and sustained their business in Martin County. Even though many felt like the spill was a conspiracy, much of this feeling was directed at the EPA, not MCCC.

Respondents held views that simultaneously supported and opposed the coal industry. They expressed these feelings throughout the interviews. Regardless of personal feelings towards the industry, each respondent who detailed their experience through the spill spoke of the severity and significance of the spill. They also spoke positively about the clean-up process; even those holding feelings of animosity towards the industry. All conversations about the spill consisted of some aspect where people expressed gratitude that MCCC efficiently and productively responded to the disaster. Where the impoundment failed in the middle of the night, some reported MCCC being in Coldwater and Wolfcreek before they woke up. These feelings translated into similar

feelings about the clean-up process, as well. Individuals said, "*they did the best they could do*" and "*they did a good job*." In all, MCCC managed and conducted a quick cleanup process according to those interviewed.

Respondents said there was a short-lived critique of MCCC in the community following the spill. However, many called it short-lived because the community soon became aware of what they were critiquing: a coal company. As MCCC is now defunct, it was discussed as a significant economic source in the county. A strong relationship with MCCC emerged and strengthened over the years. People were afraid to speak out against MCCC because many community members, worked, or had family who worked for MCCC. For example, respondent Elliot recalled standing with his uncle, an employee of MCCC at the time, watching slurry come down Coldwater; his uncle began to cry. Elliott reported his uncle still supports the industry.

Familial connections to MCCC and the coal industry were prevalent among those interviewed. Four individuals worked at some point for MCCC, or another coal company, from one summer to 17 years. Familial connections were reported more than personal work experience. Roughly 80 percent (18 out of 22) reported at least one family member employed in the industry. Out of the 18, there were 38 reported family connections with the industry; nine cousins, six uncles, five brothers, two brothers-in-law, three grandfathers, three fathers, two boyfriends, two husbands, one nephew, one son-in-law, one son, one mother, and one aunt. For some individuals, answering this question was a difficult task. Some individuals counted with their hands and others stared off into the distance pondering the exact number. The reported admiration for MCCC's efforts and economic support of their families and the strong connection to the

coal industry influenced the way the community remembered the spill in the following years.

The Memory of the Spill:

The EPA and other government agencies departed Martin County in the weeks following the initial disaster. However, MCCC continued to have a noticeable presence in Coldwater and Wolfcreek in the following months during which respondents said the entire cleanup process took a couple of months. Individuals recalled seeing slurry up the hollows, as well as in local creeks for months. Once slurry was no longer visible, conversations about the spill diminished little by little. The overall buzz of the spill died a year or two later. Those interviewed said the community does not talk to others about it, nor do they hear others bring it up. Individuals were unable to recall the last time they discussed it with a fellow community member. When asked to recall the last time they discussed the spill with other community members, many respondents said, "*I can't remember*" or "*not in years*." They were also unable to remember the last time they thought about it. However, three individuals spoke about how the memory of the spill will always remain because it was such a profound moment for Martin County.

Many critiqued their community for neglecting the memory. For example, respondent Casey said, "*[the community] thought 'Big Coal' did nothing wrong. They also thought everything is fine. Everything will be fixed*". Respondents voiced these opinions during discussions about the lasting impacts of the spill. Some said that even though the spill contaminated local creeks and soil, these impacts are now resolved. However, respondent Estill said, "*they will always feel the effects of the spill."* Her

statement was reflective of many others. For example, another respondent said, "*they didn't learn anything*". They provided three explanations for the lasting physical and environmental impacts. The first is has to do with where MCCC took the slurry. Individuals said slurry was transported out of the county to other impoundments. However, many said it is common knowledge that MCCC purchased land in Coldwater, dug holes, poured slurry into these holes, buried them, and moved on. MCCC created housing developments on this land, and this has increased the population, the value of homes, and the socioeconomic status of the hollow. Respondents critiqued these populations for ignoring this, as slurry will forever remain under their homes and soil.

The second reported lasting impact concerning the power coal mining has over the county. Since this was a coal-based disaster, interviewees said the Martin County community quickly accepted and forgot about the spill. Backlash and dissent from the community were minimal. As a result, Martin County residents lacked social capital needed to challenge MCCC. Respondents said the community failed to learn anything about the material impacts coal-mining has over the county. By accepting it, they helped sustain the industry's authority. Many said that the coal industry would continue to plunder the county until its exodus because it encounters minimal conflict from the residents. Even if a similar disaster occurred, individuals feel their community will not be prepared. The events will play out the same way as before and will be quickly forgotten. This was reported as a lasting impact due to the knowledge that, at any moment, a coal company could cause a similar disaster. Without a supportive community, community members adapted to the fear of future disasters. One respondent

said, "*we accepted it and learned to survive*". This suggests the resiliency emerged in the form of adaptation.

The third reported lasting impact concerned the Tug Fork River, which is between Kentucky and West Virginia. See Map 5. In the days following the disaster, slurry penetrated the Tug Fork River through local creek systems. Individuals described seeing sections of the Tug Fork River inundated with black slurry. As more slurry entered the river, it slowly moved towards the Big Sandy River. In response, communities downriver shut off water intakes for fear that slurry would contaminate their water supply. Martin County did the same. The Tug Fork River is a source of water for Martin County; the county also sources water from a reservoir, but the reservoir is not enough to supply the entire county. With slurry in the water source, the county built a temporary pumping system to take water from Middle Fork Creek, another creek in the county.

Individuals described seeing a water line extending from Middle Fork Creek to the reservoir. The line ran directly through downtown Inez. Respondents felt it was built haphazardly. The construction took roughly a month; some said this was too quick. The county also did not bury the water line. The water line burst on Christmas Eve of 2000. Individuals reported fixing Christmas Eve dinner and suddenly, being without water. Members of the community left their home to check the line. It was obvious where the break occurred because, as one respondent said, "*It was like a water fountain froze. It was beautiful*". Respondents said an image of the break was on the front page of the local newspaper. Now, without a water source, the county started pumping from the Tug Fork River again even though the river was still running black. Once the community's

water supply was turned back on, lime, which is used to clean slurry, came from the faucet; this caked on the bottoms of pots and pans turning them white.

Martin County residents have always perceived the Tug Fork River as dirty. Respondents call it a "*giant trash pile*" and "*the nastiest place you'll ever go*." Many were unable to recall a time in which the river was not filled with trash and muddy. The dirty water was reported to be from years of neglect and coal mining. Coal companies in the county historically discharged waste into the river. Respondents felt coal waste in the river has always been a concern for their water quality. The day slurry entered the Tug Fork River, concerns increased and even turned into perpetual fear in the minds of some respondents. From these discussions, individuals began talking about their water quality. Many said that, even though the spill was reported to be suppressed, water quality was not. Here, the research evolved to capture both stories concerning the spill and the water quality. Themes and data concerning water quality are presented in the next chapter.

CHAPTER 6: THE WATER

This chapter focuses on another *environmental stressor* in Martin County: the water quality. Through interactions at town meetings and interviews with community members, reports emerged that Martin County residents do not drink city water. Respondents and those at water meetings claimed well-water was clean and safe for consumption. This theme emerged from discussions about the Tug Fork River contamination following the spill. Water quality also emerged because individuals felt it was the most critical issue facing the community. This was discussed, as not only a historical problem but one the community is currently experiencing. This chapter begins with a discussion of reported experiences with the water. Interviewees' descriptions of city water, how and if they used it, and alternate water sources help explain why they avoid city water and came to think of the condition of their supply as normal. Those interviewed and those at water meetings attributed the poor water quality to poor infrastructure and the mismanagement of local government. In response, there is an emerging grassroots movement focused on fixing and improving water quality.

"I Invite Anyone To Come See How I Live": Experiences With Poor Water Quality

The first observed component of the water quality issue in Martin County arose from the way people described it. According to respondent Coosa, "*this is the worst water system any city can have*". Depending on the day, the water looked different.

Words used to describe their water were, "*dark brown*," "*cloudy*," "*thick*," "*non-transparent*," and "*oily*." One respondent said, "*the water rarely looks clean*." Even though individuals spoke about the aesthetics, the most common descriptions of the water were in respect to the smell. Residents said the water had a strong sulfur smell and extremely potent and pervasive and near unbearable to endure. For example, Lewis said, "*you can't even pee in a commode without it just stinking. It burns your commode*". The smell even pervaded the strong aroma of Clorox and filters in ice makers.

The spoiled nature of the water hindered its utility around the home. Individuals who reported using the water strictly for washing dishes claimed it left an oily film on plates, cups, and dishware. The fear of eating, drinking, and cooking with these items persisted post washing because they felt dish soap was not effective. City water also destroyed appliances and residents of Martin County have thrown away refrigerators, ice makers, coffee pots, and water heaters. According to Lewis, "*you scrub your commodes every day, or put in a new commode in every year*." Many also reported leaving the shower covered in rashes and red skin; rashes persist and get worse the more one showers. Rashes can be small or cover large sections of the body. Individuals showed fellow community members their rashes at water meetings as a way to detail the severity of the issue. To get rid of rashes, some community members reported traveling out of the county, either to Kentucky or West Virginia, to take showers at friend's and family's homes.

Residents said avoiding the water for washing, appliances, and showering was challenging. However, they said avoiding drinking water was easier because they buy exclusively bottled water. The Martin County community has become accustomed to

buying bottled water as their single source of drinking water. Interviewees and those at water meetings reported budgeting for roughly $50-150 extra per month, on top of paying a water bill that served them no utility; sometimes the cost was the same as the water bill. They budget more for gas when the local grocery stores run out of bottled water. Individuals said it was common to see an empty water aisle alongside seeing shopping carts fully loaded with cases of bottled water. As this was common, residents frequently drove outside the county for water.

Many felt that traveling outside of the county, strictly for water is what they have to do to survive. The nearest sources of bottled water are Louisa's Wal-Mart and Paintsville's Wal-Mart, 23 miles and 32 miles from downtown Inez, respectively. Some drove more than an hour and a half, across multiple counties to buy enough water. Trips out of the county were bi-monthly ventures, often requiring them to buy and haul back large quantities of water. These ventures were reported to be extremely tiresome and an annoying burden. As Coosa said, "*it is extremely tiring*." Respondent Rowan spoke about how driving out of the county became too much for her to handle. So, she made accommodations. According to her,

> When you have no other means, when you have nothing else, what are you going to do? I have found a spring, which nobody knows about that I keep to myself, so I can get water every month to use for coffee and to cook in and to drink. There's people here in Martin County that cannot do that. They just can't. I gather about 75 jugs and I haul them. I take empty jugs, fill them up, haul them back home about every month and a half. At first, my husband and I started buying bottled water. Then that got expensive on us. My husband was raised around here so, he knew where a couple of places was at where there used to be springs when he was growing up. The spring we use isn't even in this county. I have a pickup; you put 75 gallons of water in a back of a pickup, that's a load! Having it do it every month and a half, two months, is something I would rather do than drink what comes out of that faucet.

She declined to disclose the location of the spring because she did not want others to know about it. This saved her family roughly $150 a month. However, buying bottled water was not accessible to all residents of the county; many cannot afford to buy bottled water. Respondents expressed concerns for those in the county on fixed incomes, the elderly, and those living deep within hollows. This was an example of how socioeconomic status intersected with the water crisis. Residents said these populations could not budget extra each month, nor travel for clean water. Residents broke down into tears at water meetings over concerns for those of a lower socio-economic status. There were also stories of community members abstaining from eating to have clean water. In a community where the water quality affected all, buying bottled water was a privilege. Respondent Madison summarized this concern and privilege,

> But, we can afford it. But, then you take somebody that can't afford it. I care about them. I care about what they're putting in their baby bottles. I mean, I am ready to quit [fighting for clean water] because I get discouraged at times. I have wanted to quit 100 times and then you have someone come along and you see the real need. You say 'that's one of them'. For the people who can't afford to buy water, they put that in a baby bottle, they have to drink it because that's all the water they have. It is very common, very common [to see this]. Anybody that's drawing disability or social security, or they're drawing food stamps, those people can't buy water. I know there is a million reasons why they are drawing a check on food stamps, it doesn't matter why. It doesn't matter what everybody thinks about that. The fact is they cannot afford bottled water and they have no choice. They can't afford to pay a water bill, nor buy water.

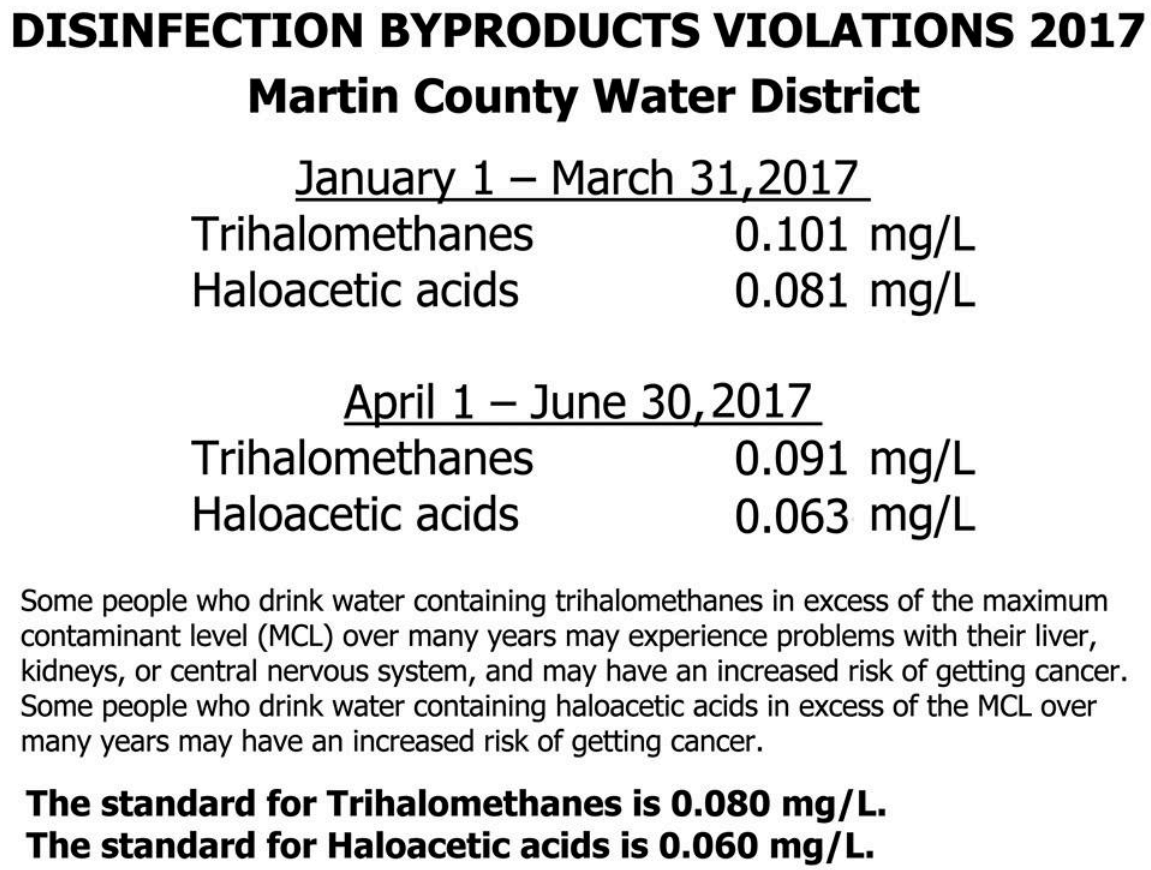
She went on to discuss how this compelled her to assist these populations, whenever they needed it.

> Yes, it is [a huge distance for people to travel]. I have helped people with gas money or even a ride. I mean, I have people that I'll go and take them groceries every week, or I'll get them stuff for them in my old neighborhood

> because they need help and I can help them. This is my contribution, but there are all kinds of people that I don't know what they would do if I stopped helping them and nobody else stepped in, I don't know what they would do [pauses]. I have to help my family. Well, I have like three regulars that I help at least once or twice a week and then just random people. I would say, a handful. I don't know an exact number. If somebody asks me for help, I'll help. But, I have my regulars that actually are expecting me a certain day.

Regardless of socioeconomic status, age, and location in the county, poor water quality affected everyone. Data suggest poor water quality has become normalized in the community. This emerged during discussions of residents' water bill. Each month, residents received a water bill with a boil water advisory because the Martin County Water District has been out of compliance and exceeded EPA limits since 2005 (Hinckley 2017). Respondents were unable to recall a time when their bill did not contain a warning. As Russell says, "*[this has been happening] my whole life*." Advisories warned the user that the water district is out of compliance, as well as warns that long-term exposure and consumption can cause problems with the liver, kidneys, and central nervous system. See Figure 2 *Disinfected Byproducts Violations 2017: Martin County Water District*. They routinely threw the advisory in the trash because it was so common. For example, after asking Coosa to see a copy of her water bill she said, "*I throw that in the trash*." Advisories also reinforced the normality of poor water quality.

Figure 2 Disinfection Byproducts Violations 2017



DISINFECTION BYPRODUCTS VIOLATIONS 2017
Martin County Water District

January 1 – March 31,2017

Trihalomethanes	0.101 mg/L
Haloacetic acids	0.081 mg/L

April 1 – June 30,2017

Trihalomethanes	0.091 mg/L
Haloacetic acids	0.063 mg/L

Some people who drink water containing trihalomethanes in excess of the maximum contaminant level (MCL) over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer. Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.

The standard for Trihalomethanes is 0.080 mg/L.
The standard for Haloacetic acids is 0.060 mg/L.

The normality of the water issue also emerged from personal interactions with residents. Those interviewed in establishments around town either brought bottled water or a reusable bottle. While at local restaurants, they refused to order a draft soda because the carbonation required city water. Those interviewed in their homes drank bottled water, soda, or tea made from bottled water. One respondent made coffee during the interview using water from a plastic gallon container. The corner adjacent to his coffee maker was brimming with empty, half full, and full gallon water containers. It was clear

that these individuals constantly made every effort to avoid using the city water at all costs.

Normality also emerged from discussions with those who no longer resided in Martin County. Three individuals described moving to a community with clean, safe water as a culture shock. They had lived with poor water quality their entire lives and developing a new normal felt strange. For example, Elliott said he approaches the water tap in the kitchen with caution. Every single time he approached the tap unveiled lifelong memories of the water quality. In his words, "e*very time I go to the faucet, I think about the water*." Because caution was instilled into him for so many years, avoiding the water was still his normal reaction. Furthermore, even though his new community has clean water, he reported continually reminding himself, and daughters, of the quality before traveling back to see family.

Respondents avoid Martin County water because it smelled and was discolored. They also avoided it because they believed it would kill them. Residents claimed family and fellow community members' deaths were becoming more common and frequent. As one respondent said, "*Martin County is a hotspot for illness and sickness*." If they were not dead, they had some reported illness/sickness. Everyone attributed this to the water quality. Cancer was the most common illness reported. However, it was not the only reported health problem: kidney failure, kidney stones, urinary tract infections, rashes, skin lesions, spinal issues, birth defects, stomach problems, throat issues, and *e. Coli* contamination were others. It was common to hear someone reference at least one person with some form of illness he or she cannot remedy; most often it was a multitude of people with maladies. These included mothers, fathers, sons, daughters, grandkids,

cousins, uncles, sisters, brothers, co-workers, neighbors and fellow community members. Individuals even told stories about how their physicians suspected their water source was the cause of the health problems.

Residents reported hearing a new account of sickness or death every single day. As a result, everyone had their own personal or community story to tell. Three stories captured the experiences of Martin County residents.

> I know a lady that is a friend of mine. Her mom has cancer. Her son, her own son is having issues because they can't afford bottled water. He is going to have surgery because he is having so many stomach issues and throat issues. They said his esophagus looks to be like that of a 40 or 50-year-old man. He's only 15 years old -Rowan

> I take care of my grandchildren. While they are at my house, they drink well-water, and while they are at school, they drink city water. When they come home from school, I can tell they drank city water because they burp, and it smells like straight sulfur. I call these sulfur burps. I refuse to let them leave for school without money for bottled water, but sometimes the money isn't enough, and they are forced to drink city water. -Leslie

> I went to the doctor because I was having some problems urinating. They tested my urine and found traces of animal feces. I told the doctor about our county's situation and how lines will break, and stuff will leak in. He suspects it is because of this. - Man at a water meeting

Stories like these circulated the community and increased the awareness and knowledge that health and water are related concepts. The awareness heightened to the point people were afraid to give their animals/pets the water. Residents reported buying additional cases of bottled water for their companions. Those unable to buy extra bottled water for their animals claimed Martin County water caused their cats and dogs to have discolored diarrhea; one individual said the water killed her dog within a day. Some claimed their animals/pets if given Martin County water, walk up to it, smell it, then walk away and refuse to drink it. Respondent Lewis spoke about how seeing his dogs turn

away the water demonstrates the severity of the water quality crisis. In his words, "*buddy, you know it's bad when dogs won't even drink it*."

The strong perception linking adverse health outcomes to the water was also shown from the fourth water meeting. Researchers from the University of Kentucky Public Health attended and informed the community of their upcoming research seeking to quantify the water issue. They wanted to test individuals' water, as well as ask them to take an in-home health-based questionnaire. The two researchers told the 28 individuals in attendance that they are going to look beyond cancer and study urinary, kidney, and bladder issues. Many were happy to see people outside of the county care about their issue, as volunteers emerged to be included in data collection and help administer the study. However, there was some concern from the group concerning the utility of the study. The community began to question why they needed more data because the community already knew it was a problem. The researchers said hard data was needed to inform state government. Responses from the community were, *"our water is the same as drinking from the ditch," "people from third world countries get better water than Eastern Kentucky,"* and *"I know 53 people who have cancer, most people don't even know 53 people!"*. As the researchers agreed with their statements, the community continued to inform them that hard data will only confirm the somber reality they knew.

"*Y'all Got A Leak!: The Infrastructure*

Respondents and those at water meetings claimed their poor water quality stemmed from two reasons. The first perceived reason was the county's poor treatment plant and service lines. Overall, Martin County residents claimed the county had a 60-65

percent monthly water loss rate. Many in the county described the water system as one that experiences many breaks. Breaks allowed groundwater to seep into the lines, alongside anything else near the lines. Individuals said coal containments, pesticides, gasoline, and other various chemicals infiltrated their water supply. However, the water infrastructure was not a new issue in Martin County. It has been a historical problem dating back to the water system's creation. Thus, Martin County residents have historically adapted to poor water quality.

Respondents said Martin County constructed their water system in the late 1960s to service roughly 600 individuals. These individuals claimed the infrastructure was poor from the beginning because it was built without a sewage system. Respondent Clark also said, "*it was built too small*." The system deteriorated further as coal mining became more prominent in the community. Around the time of the water system's creation, the coal boom occurred across the Appalachian region and companies in Martin County were extracting a considerable amount of coal. An increase of coal mining caused a significant population influx from those seeking to benefit from work in the coal mines. Respondents referred to it as a wild time for the community, as new faces, homes, and companies emerged every day.

Individuals said it seemed as if Martin County was profiting as people moved into the community, new businesses emerged, and many had economic security. However, the water system was hurting. Respondents said the county officials did not build a new water plant or expand the size of the original one. The only expansion was the addition of more lines. This added significant strain on the water system. It was too much for it to handle and respondents said lines began to become frail and break. Upgrading and

fixing the system required tax money. However, respondents said local officials refused to raise taxes on the county because they feared it would deter coal companies. The second option was to use coal severance; the tax coal companies pay counties for the amount of coal extracted. Many said that officials have historically abused coal severance money and thus this tax source was not allocated to the water system. So, without attention to the water system, the population continued to expand, adding more strain to the system.

As local government failed to fund or improve the water system, so did the coal industry. Respondents said the coal industry strained the water system by increasing the population of the county. However, companies did not fund improvements to the system. Over the years, individuals said companies continually destroyed water lines across the county from various extraction methods. Little attention was given to repairing these breaks. Companies responsible refused to pay for the fixes. Respondents claimed companies had this power because local officials minimized conflict. This continued throughout the years and, as a result, Martin County's water infrastructure deteriorated. According to Clark,

> So, generally, it was, the water problem was caused by the coal industry. When they sludged it [the spill], they said it was an accident, but I don't know, 300 million gallons is a pretty big accident. That messed up that little water system even more than it was to start with, if you follow me? Coal and water are kind of interchanged issues. I don't know if they'd had a better water system, or a bigger one or anything else, if that would've made any difference about the sludge, but I think it would have. I have always believed that the factor of them not expanding the water lines and the system while they had the money, while there was a lot of people there, they just didn't do it because the mines didn't want to pay for it.

According to respondent Roane and at the time of data collection, the water system supported over 3500 residents. This added strain forced the water system to work

harder. The system was strained further when the county decided to use the Tug Fork River as the source. Respondents said they remembered feeling surprised and shocked when their county officials decided to use the Tug Fork River. When the spill happened, perceptions of poor water quality and infrastructure increased. The community was divided on whether the spill had a direct cause on the infrastructure. Those who said there was not a connection between the water quality and the spill, said they have always known their water quality was poor. For these individuals, the spill simply added more strain. Those who said there was a definitive connection were unable to detail precisely what the spill did to the water but said it was impossible it did not impact the water.

Some said the spill gave them a broader perspective. They described heightened awareness and understandings of the material impacts coal mining has had on their community. For example, respondent Leslie spoke about how the spill was one event in her life that made her think differently about the connection between coal mining and the water supply. Her husband said that he felt the rest of the county felt the same way, even if they, do not admit it. Leslie responded back and said, "*coal's dependency has made individuals scared to find any connection between the infrastructure and the water quality*". Leslie's claim complemented others who felt similarly. Many respondents suspected that the rest of Martin County did not claim a single connection between the water quality and coal mining. One respondent said, "*the community is chicken-shit*." However, respondents said that the rest of the community agreed the infrastructure was in shambles.

"They're Greedy Little Bastards!": The Mismanagement of Local Government

County residents believe, alongside poor infrastructure, their water quality stemmed from the mismanagement of local government. "*Mismanagement*" was a word used by each respondent in this study. The term was used to critique the nature of local government in Martin County. More specifically, it was in response to the perceived lack of care, attention, guidance, and leadership of their local officials. Thus, this suggests residents also lacked *political capital* to overcome poor water quality. Individuals also felt their local officials have not used tax money appropriately and have appropriated it for themselves. Feelings of animosity towards local government were strong. People bashed and cursed names of their local officials by name. Individuals quoted, "*time to get rid of them*," *"they're killing us and getting away with it,"* and *"they are so crooked*." One respondent suggested the officials should be waterboarded with city water.

Residents said their local officials lacked guidance and attention of the water crisis. Individuals described how local officials publicly deny Martin County's water issue; some officials claim to drink the water. As residents lived with undrinkable, brown, smelly water, residents said officials claiming to drink the water was problematic. Many felt officials' privileged status gave them the luxury of not worrying about the water's quality. For example, one respondent said, "*they don't have to worry about it. They got the money. They can buy water*". Another way the lack of attention emerged was from officials' absence from a water meeting. Individuals often questioned the reason particular local officials were not in attendance, as other community members claimed it was because county residents were too poor and insignificant to receive local government's attention.

The perceived failure of local officials to hear the needs of the public challenged the community's faith in local officials' ability to lead and protect them. Many felt reduced to a marginalized number in the county. More specifically, one resident said, "*we are nothing more than a consumer to the water district and board*." Martin County folks who attended water meetings spoke of how they felt abandoned by their local officials. Residents perceived that over time, those who made careers out of political office became detached from reality. Respondents felt making a career out of political office gave these officials the time and ability to develop power relationships with the community, as well as strengthen reciprocal relationships with the water board and plant. One respondent said, "*they lie, they lie all the time*." Another respondent called the local government an empire; an empire where those at the top control those at the bottom. Respondents and those at water meetings claimed a strong division between the local government and everyone else.

Residents detailed personal encounters with local officials. Individuals said local officials "*treat [them] like dogs*" and patronized residents. One story exemplifies this best. Respondent Rowan spoke about attending a fiscal court meeting where she inquired about the water issue. Immediately local officials interrupted her; Rowan said it felt like these individuals were trying to silence her. She remembered one official telling her that if she did not like the water in Martin County, to build a well. This story highlights similar experiences reported by many residents across Martin County. Alongside feeling ridiculed, they also reported feelings of fear that these officials could at any moment threaten their employment, homes, family, and even life if they became too vocal about the issue. According to Lewis, "*if you go against them, you are going against the Devil*."

Feelings of contention over local government translated to similar feelings concerning the water board and company. Alongside feeling local government's attention was inadequate, these individuals felt the water board and company coerced them, as well. This was shown from conversations detailing personal experiences where their water was shut off abruptly, without cause or reason. It also emerged in personal accounts of the water company failing to respond to a personal water issue. These included broken meters, lines, flooding, and low water pressure. Many expressed concerns about how difficult it was for them to make the water company listen to their concerns and issues productively. This increased the problems further. For example, one respondent said the water company installed new lines on her property in the fall. However, they failed to finish the job and left lines exposed. She was concerned the lines would freeze in the winter months. She called countless times and went to the water company to persuade them to fix their work. The water company failed to respond, and in the winter months, her pipes froze. She, therefore, poured gasoline near the exposed water line and ignited her front yard on fire to thaw the lines.

Residents of Martin County believed their problems stemmed from corruption. One respondent said, "*Martin County is one of the crookedest counties in the state of Kentucky*." All had strong suspicions their officials and the water company have stolen taxpayer money and misappropriated funds around the county. Every single person interviewed referenced the construction of a new courthouse as proof. Martin County has three courthouses. One is registered as a historic landmark and the other two house government activity. Officials claimed the county lacked money for a new water system, so when they decided to build a third courthouse, residents reported feeling confused,

distraught, and angry. For example, Russell said "*it has rubbed me wrong since they built it. We are the only county, that I know of, that has three courthouses"*. Residents did not know where the money came from, as officials publicly say it came from a grant, a loan, and coal severance money; they say one thing, then another. This multi-million-dollar expenditure on a new courthouse was described as a controversy, as well as a conspiracy. Many suspected the third courthouse is used to funnel money and house the rich career politicians. It has also sparked resistance from the community. As Leslie describes,

> I call it the Palace, or Emerald City! It's nice!! The second courthouse wasn't fancy enough for them. It's so nice that I like to pee inside the courthouse. I walk in and use their bathroom. I do this because I know it pisses them off! I know they are thinking 'The Peasants are peeing in the Courthouse!

The awareness that local officials wastefully spend tax money impacted perceptions of economic support from higher forms of government. During data collection, the Appalachian Regional Commission (ARC) awarded the county a total of $1.2 million towards their water infrastructure; it was reported an entire overhaul of the water system would cost around $15 million. Individuals appreciated that an outside source cared enough to give the county money, but also felt it would not go to good use. According to respondent Coosa, "*if they send in money or anything, they usually pocket it and we get nothing*." Other residents described it as "*hush money*" and "*breadcrumbs."* They also felt that once their officials received the $1.2 million, it would immediately go into their pockets.

Feelings and perceptions of local government's incompetence translated to similar feelings about state government. Individuals spoke poorly of the Public Service

Commission (PSC) and the Division of Water's (DOW) lack of attention to this issue. For example, on August 29th, 2017, the PSC and DOW came to Martin County to take formal testimonies of community members. The original location for this meeting was Frankfort, KY: over two and a half hours away. After complaints and pressure on the agencies, they moved it to the third floor of the *Roy Collier Community Center* in Inez. Over 100 individuals from Martin County attended ready to voice concerns. Officials from the PSC and DOW sat at the front of the room and began the meeting indicating they were going to give a presentation about the regulation of water systems. Throughout the meeting, officials said, "*I'm not sugar coating this, folks*," "*You know, this is complicated and will cost money*," "*it's up to your local government*," and "*now, I understand the water will kill you!*" (while laughing). This made residents in the room irate.

One resident stood up and interrupted an official demanding formal testimony be taken now, not later. She had to get home and wanted her story on record. The officials mentioned that she is free to say whatever she wants now, but it will not be on the formal record. She pleaded with them, as did the rest of those in attendance, as they refused to change the record time. Many exclaimed this was the reason they came and did not want to hear a presentation; many community members left. Thirty minutes were given at the end, as 15 community members formally testified. In the weeks following, respondents described the meeting as "*dense,"* "*lame*," and "*unproductive*." They felt the PSC and DOW treated them poorly, tried to silence them, and acted like the community was uneducated.

Residents said much of their resentment for local government was historical. Respondent Coosa said, "*there's no trust in government here*." Another respondent said, "*Martin County is very anti-elected officials*." Events like the spill, the water crisis, and meetings, like these, increased animosity. Many said this destroyed their faith in all forms of governments. However, hatred and feelings of distrust were directed at the local level. Brooke said, *"if we can't get the attention of local government, then how can we go up?"* To them, the lack of government support was a reality. Individuals reported feeling tired and fed up that local government is causing and continuing the water crisis, while state government ignores the problem. In response, this sparked and materialized a grassroots movement, aimed at fixing their water.

"We Are Fighting For Our Lives": Organizing For Change

To challenge their *adaptive resiliency* frameworks of adapting to poor water quality, residents began to resist. The *Martin County Concerned Citizens* formed earlier in the year of 2017. Residents expressed feelings that their movement was small but, were optimistic about its vitality and importance. Many also felt like organizing was long overdue, as it was time for them to begin to make their community better from the bottom up. In the year of 2017, there were a total of six water meetings hosted by the *Martin County Concerned Citizens*. The purpose of these meetings was twofold. First, it served as a centralized time for people to voice communal experiences, struggles, and thoughts concerning their water issue. This helped make the water issue, not only a personal trouble, but also a community issue. The second goal of the meetings was to

direct community goals. Following each meeting, they made goals for the next meeting, reminded each other to stay on track, and stressed the importance of community support.

Individuals in attendance came prepared to tell stories.; sometimes this meant screaming at the top of their lungs, and others it meant breaking into tears and crying. The number of people in attendance increased after each meeting. However, meeting size average around 20 individuals. Individual residents still remained afraid to stand up publically. They described being vocal as a unique trait in Martin County. Individuals said, "*I don't care if they know it's me*," "*I have nothing to hide*," "*You can use my name*," and "*if you are telling the truth, there is no need to hide a name*" as they signed the research consent form. For those who claimed to be vocal, they had their reasons. Still, all personal reasons stemmed from feelings of morality and doing what was right. Motivations aimed at protecting family, community, and overall justice. These were not mutually exclusive, as many spoke about the intersection of all three.

The best example of protecting family was Whitley, a 31-year-old single mother. Whitley spoke about how standing up and being vocal was never something she did earlier in life. That changed once she noticed her kids getting out of the bathtub covered in red rashes. She also spoke about how the water has given her health problems that she requested be redacted. To her, this was enough. She immediately started going door to door and asking neighbors about their experiences, as well as trying to get them motivated and organized. Leslie's activism was also activated by seeing her grandkids impacted by poor water quality. She has become extremely vocal towards the local officials and others within the community about the nature and solution to the water problem. She also said she learned a lot about being vocal from her father, who was also

a vocal individual. Family motivations were also represented at water meetings as countless individuals claimed to stand up due to their family's sickness.

Residents reported feeling connected and loved their community. Individuals in the community have been lifelong companions. For example, respondent Brooke described her relationship to the community as "*clannish*." Another said, "*it is my home. I love it. I love the people here*". The relationship contains history, strong relationships, and memories. Even though many in the community were not vocal and did not attend meetings, reports of still wanting to help these individuals emerged. At the intersection of family and community, many spoke about these as being one in the same. One being their family cannot live and survive in a community with poor water and two because these individuals saw their community as their family. Many called Martin County a family; a family they will fight to protect.

Motivations stemming from justice followed from reports that the water crisis is unfair. People were tired of seeing the community in constant dire situations, as many blamed it on the county's socioeconomic status. One respondent described this feeling by saying, "*I am tired of us getting shit on*." Another said, "*after years of all this bending over and letting the people give it to us, we have to start making our community better*." There comes a time in many people's lives where enough is enough, and to these individuals, the water crisis was the moment they decided to fight back; some reported the spill as the tipping point. The best way to exemplify this motivation is from the words of Lewis, whose desire to fight injustices stems from religious beliefs,

> Nobody will stand up for people. That's something that right now the people of Martin County are starting to open their eyes. It might be too late but, people's tired of it. There's starting to be more people come to meetings than anything [before]. This bunch is getting away with murder.

> You know, [referencing the spill], someone from Massey should have gone to the pen, but they didn't. Maybe God needs to come back. It's a modern-day Sodom and Gomorrah here. I will stand up. I do not care! God will judge me. Heaven is real. I will not go to hell!

However, respondents said many in the community were still passive and silent. Reasons given were fear of local government, historical division, and feelings of powerlessness. According to some, the coal industry has historically created a division between supporters and those in opposition. The division created by the industry has become entrenched in the community. This translated to a division amongst community members between other issues, like the water quality issue. The fear, loyalty, and hopelessness instilled by this division persist in Martin County, even if coal mining is not explicitly linked to the problem by the respondents. However, many reported seeing more community members come to voice concerns than before. They attributed this to the failure of their community to connect coal mining to poor water quality. In this sense, the lack of connections made people feel more comfortable standing up. Nonetheless, it has become instilled in Martin County that voicing concern has negative consequences. A majority of the county was reported to be socialized and forced into silence. According to Morgan,

> Some of it's fear. They're afraid, they just don't want their name or their face. However, a lot of people around here would like to kill my ass. There's targets on my back, but they know I will talk if they got something to say. I have been called a professional protestor. The thing about it is, the reason [people who stand up] are considered weirdos is because we even think fish should have clean water. How weird is that? We're considered environmentalists, tree huggers. You really think having clean drinking water means you're a tree hugger? Everybody here is waiting on Erin Brockovich. They talk about it all the time. They don't realize that you're going to have to stand up for yourself. You are from here [referencing people in his community}. It's affecting you. Don't be staying in the

> foxhole when others are going to the front lines. You look back and everybody else is down in a foxhole and there you are.

This quote highlights the struggles many in Martin County faced when standing up. They felt abandoned by the rest of their community, yet they persisted. They felt ridiculed by others, yet they persisted. They felt scared their actions may have adverse consequences by officials, yet they persisted. Persistence was also shown in conversations with two respondents who spoke about personally running for local office. These individuals said the water would be their priority as local officials will not control them. Many felt this is the first time in Martin County's history where fighting back was an option. This suggests the emergence of social capital; a barrier they lacked following the spill. They expressed hope that their movement will be impactful, meaningful, and influential. Community organizing was how this community resisted local government and looked towards the future.

CHAPTER 7: THE FUTURE

The interviews covered three topics: the spill, the water quality, and the future of Martin County. The stories presented in the previous chapters were about real people; real people with real experiences, real backgrounds, real families, real struggles and real obstacles. Fixing the water quality was a task they felt was their responsibility because governments have abandoned them. They felt trapped and questioned their community's future. Concerns were whether the water quality issue will ever end, what will happen when coal is wholly gone, will cancer rates ever reduce, and what kind of opportunity will they have in the future. These were questions individuals reported to ask themselves on a daily basis. The reported uncertainty of the answers traced to the coal industry's exodus from the county.

It was unanimous across all individuals interviewed that coal was in decline. There was some disagreement over whether coal was completely dead or on its way out the door, but people recognized, acknowledged, and understood its departure from their community. Respondent Perry said, "*Martin County's coal production is significantly declining and all that remains is one company*." When that company closes up shop, coal mining will retire from the county. The company he referenced was *Booth Energy,* and during the time of data collection, *Booth Energy* was laying off the last pool of miners. Many were aware of these layoffs and viewed it as coal's last stand in Martin County. Reasons given by respondents for this departure were an overuse of EPA

regulations, the mechanization of coal, and a country moving to clean energy sources. Regardless of the reason, individuals remarked about how this decline will sink them deeper into economic troubles.

Supporters and those in opposition of the industry alike critiqued their community for historically putting all their eggs in one basket and becoming dependent upon one industry. For example, Russell said, "*we have to look beyond coal*." Even though it has given individuals job security and economic support, individuals felt it has deterred a diversified economic structure for Martin County. Respondent Leslie said Martin County, before the coal boom of the 70s, had amenities, like businesses, shopping, and food sources. She said people did not have to leave the county for these amenities. When the coal boom ended, they lost it all. Once mining started its downhill trajectory, other businesses in the community followed suit. When the coal mines closed down, everything closed down. Coal was the economy. This reduced money individuals had, as well as tax money. Businesses were forced to leave.

Respondents said Martin County continued to decline economically in the following decades. As their industrial source depleted over the years, the community lost countless job opportunities. Respondent Perry called his community a "*bedroom community*." This meant Martin County is a community where people only live; they have to leave the county for work. Out of those employed in Martin County, a little over half (53.7 percent) work within the county. Almost two thirds (60.9 percent) of the those working in Martin County are in either employed in education services/health care/social assistance, agriculture/forestry/fishing and hunting/mining, or retail: 30.3 percent, 19.7 percent, and 10.9 percent, respectively (US Census 2016e). Respondent Coosa's

statement, "*if you want a good job, you have to go out of the county*', summarizes this data.

Many in Martin County felt the county lacked opportunity. Respondents remarked about how any development to their community either goes to supporting the local government or fast food/retail establishments. For example, one respondent said, "*it's our damn luck. Martin County has always gotten the shaft*". Many said a significant contributor to the latter is Jim Booth, the owner of *Booth Energy*, as he owns countless fast food restaurants, gas stations, and tobacco shops in the county. Respondents felt this was problematic because these enterprises only offer minimum wage jobs and do not help the community. Respondents Grant and Casey critiqued it as a modern form of scrip. In the early part of the 20th century, coal companies established and strengthened dependency by using scrip. Scrip was a non-monetary form of payment given to coal miners for their labor. Coal companies employed individuals, moved their family into coal camps (areas specifically designed for coal families to dwell), created company stores that sold essential goods, and paid them in the form of scrip that could only be used at the company store (Caudill 1963). This kept the miner dependent upon the company and depressed upward mobility. Casey said,

> It's almost back to the old company deal where they pay a salary, but, yet, the miners, they buy stuff at his gas stations and his restaurants. That's it. That's exactly it. People say he's bringing in so much to the county. Well, yeah, minimum wage is what he's brought. You know? Nothing besides minimum wage.

All of this combined made Martin County residents concerned and fearful for their future. Many were pessimistic about its future because it is going to be difficult to

bounce back from coal's decline. Many said their community was already without a future, as it will be unable to rebound. This suggests residents feared the persistence of adaptive frameworks and the continuation of a historical resiliency process. Respondents felt Martin County has not prepared for the decline in the coal industry and because of this, going further will be extremely troublesome. One reported obstacle was overcoming the deeply rooted coal ideology of the community. Even as coal declines, ideology will persist for generations. They said it would keep people hoping for the day coal returns, even though it never will. This will stunt a diversified economic development, which is what all residents in this research said Martin County desperately needed. Without a diversified economy, people feared that drug use, violence, environmental degradation, and loss of community will increase. Feelings of hopelessness and fear will continue, as well. They also felt a diversified economic structure in Martin was difficult due to lack of political will and direction. However, there was one reason trumping all other reasons they were discouraged their community will one day see and have a livable future. That issue was the water quality.

Respondents want to look beyond coal and bring in a new industry. As the economy of Martin County declines, the labor pool increases as more individuals are left looking for jobs. Residents commented on the valuable labor pool Martin County has to offer, but the current water quality issue will deter industry from locating in the county. As Rowan asked, "*What business that uses water in their right mind would ever want to come here? Why would they*"? Others expressed concerns that economic investors have overlooked the county because their water was unsafe for consumption. These individuals were without optimism that their county will ever have sources for economic

activity, as they were firmly pessimistic that coal's demise meant Martin County's demise. Interviewees felt economic activity should flourish here. However, it continued to languish because of the water quality issue and the concentration of *environmental stressors*.

Residents envisioned a broken future concerning health disparities, as well. As these individuals lived around others who are always sick and dying, this was not the future they wanted because it was unsustainable. Some put it bluntly, by saying the water quality issue will continue to kill residents. These individuals knew this and lived with this; it terrified them. As much of this concern is evident from Chapter 5, another way this concern emerged was from the words on the boil water advisories: "*long-term exposure*." Many of them directly asked, "*how long is long-exposure?*", as they reported receiving notices for years. A man at a water meeting asked, "*what exactly is long-term and prolonged exposure? I am afraid I can't survive this*". The ambiguity to what precisely long-term exposure meant, increased the fear that people dependent on the water source will develop health problems at a moment's notice and die.

Concerns about health and economic development were focused on the population that will be Martin County's future: the youth. Respondents included in this research were either young to older adults, from 29 to 76 years old and the average age was 55 years old. Many of these individuals voiced concerns about how the youth of Martin County is not going to have the economic opportunity and health required to sustain community functions. Also, the youth will not have a fighting chance if the water quality crisis persists. As some of these conversations were directed at the youth as a whole, many were directed at their kids. Respondents either reported telling their kids to move

out of Martin County or stay and fight for a sustainable future. Two quotes highlight the first well.

> Of course I want my kids and grandkids to stay here. This is their home. But, I understand they can't so, I have to tell them their future rests outside of the county. -Woman at water meeting

> Leaving Martin County is something that we instilled in them and there is nothing here. There is no opportunity, but you can make it out in the world and make your own. There is opportunity in other places. - Madison

Many said this is a reality they must accept. However, some refused to give up. Respondent Leslie was one who spoke in depth on this. According to her,

> We have deep roots here. We have memories here. The kids of this county will want to move because there aren't any jobs. You fight, or you put up with it. Some put up with it. Some feel powerless. What can I do? I am not going to give up. My kids will live here! They shouldn't want to leave. The water must be fixed.

This was said, as four kids ran around the house and one sat next to her. She pointed at the one next to her and said, "*this one is very vocal. We are training the next generation*".

Even in the face of the contaminated water, deteriorating health outcomes, and bleak economic opportunities, conversations about wanting to stay within their community emerged. Many felt like they should not have to move out of their home; homes were discussed as something one does not abandon. According to residents, Martin County is where family, friends, and occupations are found, and they would never think about leaving them behind. Even Russell, who had to leave the county for work, said, "*I love Martin County"*. However, some expressed the water was too much for them. One of these was Elliott, who always knew he wanted to leave the county. The

bleak future available to county residents was enough for him to leave the county and find work. Lewis also admitted to planning on leaving Martin County. He said,

> *I tell you what, me and my wife, I'm begging her to sell everything we got here and move to Tennessee down there where my brother's farm is. They are begging people to work down there. I tell you what. If I can hold out until summer of next year and I don't die, or they don't throw me under this new courthouse they got over there, we'll be gone. I don't want no part of Kentucky anymore. My brother [another resident of Martin County] has already bought a double wide trailer and stuff. He's moving to Tennessee too. This place is a joke. If something would happen to my mother, we would leave in a heartbeat. Our county is gone. It's got so bad that I am wanting to leave, and you know I never in the world thought I would want to leave Martin County*.

These individuals said coal was dead, their water was hazardous, they lacked an adequate economic structure, and all of this combined made their future uncertain. Individuals felt forced to stay and fight, accept it, or move and abandon their home. However, they felt this was not a new reality for Martin County as they have historically experienced these problems. In other words, they have historically engaged in a resiliency process of adaptation or finding ways to survive. These combined problems have been systemic problems for decades. Residents said adapting to coal-based *environmental stressors*, a weak economy, destructive coal mining practices, the lack of political oversight and a sick/dying community was normal. Respondent Russell summarized the feelings of all, "*The War on Poverty has failed Appalachia*."

CHAPTER 8: THE DISCUSSION AND CONCLUSION

Through interviews and observations of Martin County residents, themes about resiliency, resilient capacity, adaptive resiliency, political capital, and social capital emerged as concepts that provide a deeper understanding of residents' lived experience. They capture the nature of the processes and resources that shape the ability of Martin County residents to negotiate environmental stressors. Examining Martin County residents' experiences through the lens of resiliency processes and resources informs a path for understanding the broader Central Appalachian region. Findings also inform a partial theory of resiliency. Refer to *Chapter 3: The Theoretical Framework* for theoretical concepts and assumptions that help explain the emerged theory. These findings further augment literature on disaster resiliency and the impacts of coal impoundment failures. Furthermore, findings also have the potential to inform policymakers about the concentration of environmental stressors in Central Appalachia and across the nation.

Resiliency In Martin County:

EJ literature suggests environmental stressors located in marginalized communities for many reasons (Taylor 2012). These include the racial/class composition of a community, type of stressor, the role of policy, and regional location. Even though Central Appalachians face extreme economic hardship, coal-based environmental

stressors result from historically rooted power dynamics over residents. Through coal extraction practices, coal companies have historically placed environmental stressors in Central Appalachia (Caudill 1963; Bridford et al. 1979; Gaventa 1980; Salstrom 1994; Whisnant 1994; Eller 1995). The creation and practice of MTR mining produces more environmental stressors causing water contamination (Ahern et al. 2011; Kaneva 2011; Marrian et al. 2011; Arcipowski et. al. 2017), air pollution (Knuckles et. al. 2013; Kurth et. al. 2014; Ross, McGlynn, & Bernhardt 2016), habitat loss (Kaneva 2011), and reduced topography (Ross et al. 2016). An increase of environmental stressors inevitably increases risk of exposure, which contributes to negative health outcomes for many Central Appalachians (Ahern et. al. 2011; Esch & Hendryx 2011; Kavena 2011; Knuckles et. al. 2013; Hendryx 2013; Hendryx & Luo 2014; Kurth et. al. 2014; Ross, et al. 2016). The practice of MTR mining increases the risk further through the use of coal impoundments. Despite regulatory standards, coal impoundments fail (Erikson 1976; NRC 2002; McSpirit, Scott, & Hardesty 2005; Scott et al. 2005; Mcspirit et al. 2007; Greenberg 2017) and are harmful to the environment and human health (Dewitt 2016). Thus, the increased risk of exposure to environmental stressors from MTR practices increased the risk of disaster in Martin County, Kentucky.

Ongoing coal mining practices in Martin County caused the slurry spill and the current water quality crisis. However, each were different types of disasters. Literature suggests disasters are either immediate or silent. Immediate disasters are sudden events and further categorized as natural or technological. Natural disasters result from the natural environment, whereas technological disasters result from human error or intent (Aiena et al. 2016: Gil-Rivas & Kilmer 2016). On the other hand, silent disasters are not

sudden but gradually manifest over time. Beamish (2002:151) suggests silent disasters, or "crescive troubles," result from failing to acknowledge and respond to problems over time. Over time, problems grow slowly, accumulate, and evolve. Beamish (2002) argued the Guadalupe Dunes Oil Spill in 1999 resulted from the failure of government institutions to respond and fix small oil leaks over four decades. Over these decades, leaks accumulated and resulted in widespread disaster.

Using this categorization, the slurry spill was an immediate disaster because the failure occurred suddenly in the middle of the night. Respondents claiming that MCCC abruptly mobilized into Coldwater, the spill immediately gained the attention of news sources and community members, and community members traveled to Coldwater the morning of further support categorizing the slurry spill as an immediate, sudden disaster. The slurry spill was also a technological disaster because it resulted from human error. The water quality crisis was, however, a silent disaster. Respondents claimed the water quality issue stemmed from poor infrastructure dating back to the coal boom of the 1960s. The infrastructure gradually deteriorated from pollutants in the water source, an increased population, and destructive coal extraction practices. Respondents also felt government agencies and representation historically failed to respond and fix the deteriorating infrastructure. Over time, problems associated with the infrastructure accumulated, resulting in a silent disaster.

Literature suggests power structures, not only place environmental stressors in Central Appalachia, but also suppress voices in the sub-region that challenge disasters. Thus, vocal individuals are unique and scarce in Central Appalachia (Bell & York 2010; Bell 2013). Respondents included in this study felt they were unique in Martin County

because they were not afraid to stand up and voice concern. Despite power structures in Martin County, individuals agreed to discuss details about the slurry spill and the water quality crisis. Details given during interviews captured meanings, understandings, and perceptions of their resiliency process concerning both issues. Details also captured how these individuals categorized and viewed elements of resiliency for the rest of Martin County. More specifically, data presented in the previous chapters are respondents' understandings of how the entire Martin County community responded to the slurry spill and the water quality crisis. Furthermore, those in attendance at water meetings were also of this unique population in Central Appalachia. Despite power structures, a small number of Martin County residents attended meetings, voiced concern, and organized with other community members to challenge and address the water quality crisis. Observations at water meetings provided a deeper understanding of how Martin County residents responded to the water quality crisis. The next section provides a discussion of how this small population viewed and categorized the resiliency of their community following both disasters, as well as provide a deeper understanding of the lived experiences of those living in coal country.

Adaptation In Martin County:

Interviewing residents about a coal-based immediate technological disaster alongside a coal-based silent disaster in the same community afforded the opportunity to capture similarities associated with resiliency. Residents discussed one common resiliency trait concerning both disasters: adaptation. Kelman et al. (2016) suggest adaptation is a chronic normal for marginalized communities with environmental

stressors and an increased risk of disasters. Thus, individuals develop adaptive frameworks to cope and survive environmental stressors and increased risk of disasters. The ongoing risk associated with coal mining practices has required residents to develop their capacity to mitigate and adapt to the exposure of environmental stressors. In respect to the spill, residents adapted to the fear of future disasters. In respect to the water quality crisis, residents developed adaptive techniques of survival. This section discusses how adaptation emerged historically, after the spill and throughout the water quality crisis.

Concerning the spill, residents spoke about the coal-based immediate technological disaster as normal for Martin County. Floyd's statement, "*I feel like they can do this, corporations can do this to Eastern Kentucky and to Appalachia because they've always fucking done it to Appalachia"* summarizes how all respondents felt concerning the normality of destructive coal mining practices. Even though some respondents supported the coal industry and others opposed it, all spoke about the spill as a severe disaster in their community. Feelings for the coal industry influenced perceptions of which party should receive the blame for forcing them to adapt to a technological disaster. Those in opposition to the coal industry criticized the technological failure as an inherent problem of the coal industry. These individuals blamed the coal industry, the community, and political institutions. Those who supported the industry critiqued the spill as a technological failure of the coal impoundment but not an inherent problem of the coal industry. These respondents supported the economic security of coal mining but also wanted extraction methods safe and conducted properly. Those who supported the coal industry deflected blame to the community and political

institutions for allowing such destructive disasters. Thus, placing blame on the community and political institutions was common amongst all respondents. More specifically, all felt the perceived passive nature of their community and the lack of political oversight influenced their adaptation to future spills.

Respondents included in this research claimed coal ideology suppressed the voices of their community to challenge and respond to the coal disaster. Literature suggests controlling and silencing populations is necessary for capitalism to thrive (Marx 1867; Marx 1984; Collins 1990; Smith 1991). Appalachian scholarship further suggests the coal industry controls and silences Central Appalachians through their hegemonic power to alter values and cultural systems. Historically, the coal industry has forcefully altered the minds and beliefs of Central Appalachians to actively support industry practices (Gaventa 1980; Wicks 2002; Bell & Braun 2010; Maxwell 2011; Lewin 2017). Individuals included in this study demonstrated the deeply rooted coal ideology of their community in three ways: family networks, economic support, and how their community normalized the disaster.

Bell and Braun (2010) and Lewin (2017) argue the coal industry creates and maintains coal ideology through family connections to the industry. Over generations, family members working in the industry have strengthened the affection for and support of the coal industry. Family connections to the industry also emerged from respondents' response to questions. Roughly, 80 percent of respondents reported at least one family member employed, or previously employed in the coal industry. Out of 18 respondents, there were 38 family connections to coal mining. Individuals also spoke of coal mining as a historical crucial economic support for their families. Even though these numbers

are specific to respondents, the strong connection to coal mining supports the claim that coal mining was deeply rooted in the Martin County community. Individuals supported strong family connection to coal mining in their community by claiming the Martin County community holds the industry in high regard because it has supported families for generations. Lewin (2017) suggests the coal industry creates and maintains coal ideology through supporting the local economy. Given Central Appalachians' economic situation, the coal industry is most often the sole economic provider in many communities. Over time, many have become loyal to coal companies given their economic contributions to Central Appalachian communities. Respondents said the community was devoted to MCCC given the company's historical economic support. These conversations were not limited to MCCC. Respondents said their community has become loyal to many coal companies and even the coal industry as a whole given their historical economic contributions to the Martin County community.

Literature also suggests when Central Appalachians strongly identify with the coal industry, environmental destruction and disasters become normal and legitimized (Bell and York 2010; Lewin 2017). Data obtained from respondents of Martin County supported this claim. Respondents felt since the immediate technological disaster was coal-based, many in the community became silent and quiescence about the spill (Gaventa 1980). They said conversations with fellow community members diminished roughly a year after the disaster. During the time of data collection, respondents were unable to recall the last time their fellow community members brought up details or talked about the spill. Respondents believed strong family and economic ties to the coal industry reinforced the spill as normal and legitimate in the minds of many within Martin

County. The memory of the spill will always remain, but since it was coal-based, respondents said their community suppressed the memory.

Literature suggests the coal industry strategically indoctrinates coal ideology in Central Appalachia to justify the placement of environmental stressors (Bell & York 2010; Lewin 2017). As a result, many Central Appalachians adapt to these stressors. Respondents believed their community's strong ties to the coal industry influenced and strengthened the adaptation of coal-based environmental stressors in Martin County. These individuals strongly criticized their community for supporting the coal industry regardless of its actions, failing to learn anything from the slurry spill, suppressing the memory of the event, and not resisting MCCC for their actions. Individuals knew without a supportive community, they would be unable to challenge MCCC for their actions effectively. Also, lacking a supportive community made them confident future disasters are inevitable. As a result, if another disaster like the slurry spill occurred in Martin County, the story would be the same.

Alongside blaming their community members, respondents also claimed political institutions forced them to adapt to future disasters. Literature suggests policymakers influence the continuation of coal-based environmental stressors in Central Appalachia (Ikeme 2003). Through historical relationships with policymakers (Goodell 2006) and infiltrating government agencies (Burns 2007), the coal industry has deterred policy initiatives that threaten extraction practices. Policymakers have historically crafted and implemented policy to favor coal elites (Goodell 2006). Burns (2007) suggests the coal industry is one of the most authoritative powers over the policy process given this historical relationship with policymakers. One reason political institutions establish

relationships with coal executives is that coal is an essential driver of modernization and industrialization (Salstrom 1994; Scanlan 2010). Burns (2007) and Scanlan (2010) suggest political institutions view the presence of the coal industry as beneficial for urban and economic growth. As a result, many Central Appalachian communities become economically dependent on coal, since it fuels urban and economic growth for the nation.

Indeed, themes of dependency emerged from discussions with respondents about political institutions contributing to their adaptation to coal-based environmental stressors. The respondents included in this study spoke about policymakers favoring coal elites as a historical problem in their community. Even those included who supported the industry felt policymakers have allowed destructive coal practices. As respondents perceived this as a historical problem in their community, they referenced the relationship with MCCC and the EPA in the days and weeks following the spill as proof. When the EPA made their presence known in the community, respondents claimed agency officials reduced the severity of the spill. Respondents who attended said EPA officials said the spill was not as bad as Buffalo Creek and Martin County should be thankful. Officials were also reported to normalize the spill and tell community members coal-based immediate technological disasters are normal in coal country. Reducing the importance and normalizing the spill further reinforces dependency on coal. Statements, like these, are a reminder to Central Appalachians that they host coal-based environmental stressors.

Dependency also emerged from respondents claiming the EPA operated on MCCC-owned land after the spill. Respondents said the historical regulatory capture of the EPA forced officials to operate on MCCC-owned land. They said MCCC wanted to reduce the penalty, cover up the spill, and regain their status in the community.

Literature suggests these are common reasons the coal industry establishes relationships with government agencies (Burns 2007). Respondents felt abandoned because the EPA distanced themselves from the Martin County community. Feelings of abandonment translated into feelings that government agencies would not effectively address the problem or even punish MCCC for disaster. As Lewis said, "*This bunch is getting away with murder. You know, [referencing the spill], someone from Massey should have gone to the pen, but they didn't"*. The only reported punishment was the $55,000 MCCC paid the federal government and the $3.25 million in penalties and damages to the state of Kentucky (Union of Concerned Scientists 2010). Respondents all felt, given the regulatory capture of the EPA, MCCC walked away from the spill without any serious repercussions. They also felt without a serious punishment coal companies would continue to cause disasters.

The literature further suggests the coal industry instills coal ideology to delegitimize the strength of environmental policy. As environmental policy and protection threatens coal's power (Bell and York 2010; Maxwell 2011), the industry has historically made Central Appalachians resent the EPA (Lewin 2017). Respondents supported these findings through discussions about historically distrusting and hating the EPA. The actions of the EPA following the spill increased these feelings further. Following the spill, the coal industry successfully deflected blame to the EPA. However, even those who supported the coal industry felt the EPA could have done a better job in addressing the spill. The statement from one respondent, "*you expect this from the coal industry, you don't expect this from government agencies*" summarizes this perfectly. Their feelings for the EPA translated into little hope the agency would challenge MCCC

for their actions. Thus, increasing the perception that future disasters were inevitable in Martin County.

Similar themes of adaptation emerged from conversations with residents and observations at water meetings concerning the water quality crisis. Respondents and those at water meetings demonstrated adaptation differently concerning the water quality crisis. Where the spill was immediate, respondents spoke about adaptation regarding awaiting another immediate disaster. However, the water quality crisis was a silent disaster. Silent disasters gradually manifest over time as problems accumulate, grow and evolve. Thus, disaster occurs when problems hit a tipping point (Beamish 2002). Respondents claimed the water quality crisis began during the coal boom of the 1970s when the county created the water system. In the years following, the water system slowly and gradually deteriorated as the population increased, coal companies polluted and destroyed water lines, and the local government refused to fix/improve the water infrastructure. This research collected data at a time when respondents felt the water quality had reached a tipping point.

Respondents and those observed at water meetings felt the tipping point occurred roughly 50 years after the water system's creation. However, 50 years of exposure to poor water quality has made poor water quality normal. Respondents and those at water meetings spoke about historically finding ways to survive poor water quality. More specifically, cloudy brown/clear thick/oily rancid water that hinders washing destroys appliances, gives them rashes, and causes death was a burden all felt they have had to live with throughout their entire life. To keep themselves alive, all included in this research developed adaptive techniques throughout the years. Adaptive techniques were

profoundly rooted and part of their everyday activities and life. The respondents who moved out of Martin County and described drinking straight out the water faucet as strange demonstrated the normality of this issue further. For those included in this study who lived in the county, adaptive techniques continued to be a regular part of their life.

Over time, adapting to poor water quality became more necessary alongside deteriorating water infrastructure. Residents included in this study spoke about reminding themselves on a daily basis to avoid city water. Acts, like making sure their kids had money for bottled water at school and carrying bottles of water with them to interviews and meetings, demonstrates poor water quality was always at the forefront of their minds. However, respondents and those at water meetings felt monthly boil water advisories and community members dying further reinforced the normality of poor water quality. Boil water advisories served as a stark reminder each month to not consume the water and those interviewed were unable to recall a time when they did not receive advisories from the water utility. Residents expected advisories each month and viewed that as a normal state of affairs. Expecting advisories reinforced the normality on a monthly basis but seeing family and community members sick and dying reinforced normality on a daily basis. Every single person included in this study referenced at least one family member and community member sick, dying, or dead. As everyone attributed this to poor water quality, hearing a new story of sickness or death in their community was a daily occurrence. Daily stories of sickness and death reinforced the normality of poor water quality. These monthly and daily reminders also reinforced the perception of poor water quality. Thus, these perceptions augmented adaptive techniques required for survival.

Literature suggests poor water quality is normal for many in Central Appalachia (Arcipowski et al. 2017). McSpirit & Reid (2010) claim many Central Appalachians report budgeting for and purchasing bottled water given poor water quality. This research supports these findings because drinking/buying bottled water was the most common survival technique demonstrated. This was so vital to their survival they reported budgeting for it each month, made sure their kids had money to pay for water at schools every morning, used it to make coffee, carried a water bottle with them everywhere, and bought extra cases for family, neighbors, and friends when needed. Respondents even spoke about traveling 30 miles to the nearest store to buy enough water. Details given that respondents commonly saw an empty grocery aisle further demonstrated the normality and adaptive nature of the entire Martin County community. Even though all claimed to drive to the nearest town when their grocery store ran out of water, respondent Rowan's adaptive technique to haul 75 gallons of water from a secret spring was the most extreme adaptive quality of any respondent. As respondents spoke about buying, budgeting, and traveling out of the county for bottled water as tiresome, they all knew what they had to do to survive.

Resiliency literature suggests marginalized communities adapt to the long-term exposure of environmental stressors (Gilbert 2010; Kelman et al. 2016). Research findings support this claim but further suggest managing adaptation is a privilege within a marginalized community. Even though residents felt the entire community adapts to poor water quality, finding a secondary source of drinking water was a privilege. Residents claimed buying bottled water was not accessible to those on a fixed income, the elderly, and those living deep within hollows. These populations cannot budget extra for bottled

water or drive out of the county when local grocery stores run out of water. Many also said these populations have trouble paying the water bill each month. As a result, these populations must consume contaminated water. In respect to household income, respondents were more affluent as compared to the rest of the county. Respondents were aware of their privileged status in the community and its influence on their ability buy and travel for extra water. Thus, those of higher socioeconomic status in Martin County were able to manage their adaptation, deflect exposure to poor water quality and buy bottled water. Marginalized populations in Martin County were unable to limit exposure and manage adaptation. Respondents and those at water meetings said the water crisis impacted everyone in the community.

As with the slurry spill, respondents blamed similar sources for the need to use adaptation techniques to respond to the water quality crisis. All respondents placed blame on the coal industry but were divided on the degree to which the slurry spill impacted their water quality. Many claimed the spill contaminated their water supply, whereas others said there was no way slurry contamination remained in the water supply. Interestingly, respondents all felt coal companies historically strained the water system, thus contributing to the water quality crisis as a silent disaster. Over the years, coal companies reduced the economy and tax base of Martin County that was needed to improve water infrastructure. Thus, coal companies influenced their need to adapt. However, all respondents claimed the rest of the community did not place blame on the coal industry. Respondents claiming their community does not blame the coal industry further finds support in literature on the ideological control of coal-producing communities (Bell 2013; Lewin 2017). Through historical family networks and

economic support, the coal industry successfully deflected blame to local leaders in charge of the water infrastructure.

Even though respondents believed the coal industry influenced their water quality, those at water meeting never directly connected coal mining to the water quality issue. However, respondents and those at water meetings alike claimed local government made Martin County residents adapt to poor water quality. Beamish (2002) suggests silent disasters result from years of neglect and attention from government agencies and officials. Conversations with residents interviewed and observations of those at water meetings support this finding. All included in this study felt their poor water quality stemmed from infrastructure decline brought about by their local politicians. Residents claimed local officials influenced the deterioration of the infrastructure through not allocating tax money, not fixing small problems, and not expanding the treatment plant. Over time, residents claimed local officials continued to lack care, guidance, and effective leadership focused on fixing the problems accumulating with their water quality. At the time of data collection and as residents felt the tipping point with the water system arrived, the local government continued to deny poor quality as a problem in Martin County.

Schattschneider (1975) argued that power concentrates among those in control of the political process. Whether local, state, or federal, those in control of the process decide what issues are worthy of political consideration. Respondents and those at water meetings alike felt local officials utilized their power over the local political process to control Martin County residents. In other words, local officials decided what issues were worthy of political consideration. This established power dynamics between local

government and residents of Martin County. Many felt their local officials do not work for them, do not care about their troubles, and view residents as insignificant. Simply, because residents included in this study claimed local officials do not have to worry about the water quality given their privileged status in the community. With power dynamics between local government and Martin County residents, enforcement, protection, and attention to the water quality crisis diminished. Thus, poor water quality persisted, causing Martin County residents to adapt and cope.

Through discussions with residents about the slurry spill and the water quality crisis, similar themes of adaptation emerged. Following the spill, residents felt that being a silent community and the lack of political oversight influenced their adaptation to future immediate technological disasters. Concerning the water quality crisis, those included in this study all felt the lack of political oversight augmented failing water infrastructure and adaptation to environmental stressors. However, a discussion of adaptation in Martin County cannot be isolated to one event, like the slurry spill or the water quality crisis. Forms of adaptation was a result of historically hosting coal-based environmental stressors and began when coal companies forcefully took over the region in the late 1800s (Lewis, Johnson, & Adkins 1978; Bell & York 2010). Adapting in Martin County continued and increased as coal companies responded to the growing demand for capital and profits (Gould et al. 2008), strengthened coal ideology (Bell 2013; Lewin 2017), and developed relationships with policymakers (Burns 2007). As respondent Lewis said, *"the spill and the water are only dots on the story of Martin County."* Thus, adapting to coal-based environmental stressors was normal for this community.

Resistance in Martin County:

Martin County has historically engaged in a resiliency process of adaptation. Given the continuation of coal-based environmental stressors, Martin County developed adaptive techniques to endure the presence and continuation of coal-based environmental stressors. Thus, residents felt they never truly overcame the spill, nor the water quality crisis. As individuals included in this study were a unique vocal population of Martin County, they all spoke about historically wanting to resist. However, similar forces that influenced their adaptation hindered their resistance capacity. These included the coal industry, a silent community, and the lack of political oversight. This section discusses how these forces also hindered the capacity of residents included in this study to resist and fight back against MCCC following the spill. Then, this section discusses how and why adaptation transformed to resistance concerning the ongoing water quality crisis.

Concerning the spill, respondents wanted to challenge and resist the actions of MCCC. Even those who supported the coal industry wanted to challenge the industrial failure of the coal impoundment. Respondents who saw the spill's impacts described it as disastrous and detrimental to their community and those living in Coldwater and Wolfcreek. These individuals also reported feeling scared, shocked, and stunned. Those who did not directly see slurry in Coldwater and Wolfcreek spoke about the irreversible environmental impacts. The perceived severity of the spill made all respondents want to fight back. However, resisting any action of a coal company was a taboo in Martin County. Bell (2003; 2008; 2010; 2013) and Bell and Braun (2010) suggest coal ideology

divides populations in Central Appalachia and divisions hinder resistance to destructive coal practices. Historically, when Central Appalachians have resisted the coal industry, they experienced family troubles, loss of community, and even death threats (Bell 2013). Divisions further weaken social connections within Central Appalachian communities. Resiliency literature further suggests weak social connections negatively impacts resilient capacity. Social capital, broadly defined as anything that connects people together (Cagney et. al. 2015), includes networks, relationships, trust, collective identity, and communal support (Gilbert 2010; Chamlee-Wright & Storr 2011; Bergstrand et. al. 2015; Cagney et. al. 2015; Gil-Rivas & Kilmer 2016). Coal ideology undermines all of these forms of social capital (Gaventa 1980).

The reported strong family ties to coal mining and economic dependency, not only influenced the adaptation to coal-based environmental stressors but also undermined forms of social capital in respect to resistance. Respondents claimed coal ideology reduced networks, relationships, trust, collective identity, and communal support with fellow community members. Respondents were a unique minority of vocal individuals in Martin County amongst a majority who strongly supported coal mining. Their uniqueness made them feel like outsiders within their community. Thus, respondents did not attempt organizing with their community following the spill because they knew they would not have the support, nor trust with the community to effectively resist. The fact that the spill was coal-based meant community members remained silent and feared to attack a coal company. However, respondents did report minor backlash from the community, but only in demand for answers. The minor backlash was short-lived, as community members did not want to challenge their economic source and livelihood.

Respondents further lost community support to resist due to the isolated nature of the spill. The localized nature gave MCCC the power to barricade Coldwater. Barricading Coldwater disconnected the community from those living in Coldwater. Respondents said they were unable to talk to those living in Coldwater and learn what happened. When MCCC removed the barricade, Coldwater residents reunited with their community. However, respondents claimed Coldwater residents remained silent and acted like nothing had happened. For example, the teachers who worked with residents from Coldwater said they never mentioned the spill. In the following weeks, Coldwater residents remained reticent about the spill. Respondents discovered in the following months that Coldwater residents signed a waiver with MCCC, giving up their right to talk about the spill with others. This reduced community support to resist because respondents felt if anyone resisted, it would be those directly impacted. The fact that no one from Coldwater agreed to an interview for this research further suggests Coldwater residents choose to remain silent about the spill 17 years later.

MCCC's barricade reduced another form of social capital needed to resist: collective narratives, stories, and conversations (Chamlee-Wright & Storr 2011). The barricade not only prohibited Coldwater residents from communicating with the community but also prohibited community members from getting information from those in Coldwater. The localized nature of the spill and the barricade reduced avenues for information, disaster details, and recovery updates. It also barred many community members from seeing the impacts of the spill. Even though some respondents claimed to go beyond the barricade, many in the community were unable. In the da\ys and weeks following, respondents felt confused, as many details of the spill remained unknown. In

order alleviate their confusion, respondents either called or saw other community members around town and asked them if they knew details of the spill; many were just as confused. Lacking details reduced avenues for stories, narratives, and conversations about the spill to develop. Respondents said they wanted to resist but did not know exactly what to resist, as all they knew was a coal impoundment failed. They lacked adequate information, details, and stories about the nature, severity, and impact of the slurry spill. Without adequate details and a supportive community, respondents felt powerless to effectively question and challenge MCCC about the disaster.

Alongside forms of social capital, resiliency scholarship suggests forms of political capital are equally important for overcoming disasters. Political capital constitutes support from governments. Governments can work alongside communities to direct recovery, help rebuild communal functions, and strengthen recovery goals (Kennedy et al. 2013; Aldrich & Meyer 2015; Bava et al. 2010). Through interviews, respondents spoke about historically lacking connections and trust with decision makers. Even so, many were hopeful government agencies and officials would help direct recovery. This optimism translated into feelings that government would actively assist the community to resist and challenge MCCC for their disaster. However, respondents said the EPA did not engage with the community. Instead, they favored coal elites and only served those in Coldwater.

As respondents said some agencies came to their community, the EPA was the one everyone identified. The EPA was the only agency reported that directly engaged with the community. In the weeks and months following the disaster, the EPA and other government agencies kept their presence hidden. This contributed to increased feelings

of apprehension and confusion. Respondents said they began feeling pessimistic that governments would eventually engage with the community and provide disaster details. When the EPA hosted a community meeting at the high school, respondents felt relieved. As the meeting began, respondents said the EPA did not direct and inform the community about the spill's recovery. On the contrary, the EPA spoke down to them, were abusive, made some feel like "*dumb ass hillbillies*," did not take the spill seriously, and suppressed details. As respondents wanted to resist the spill, they also wanted the EPA to help them resist and fight MCCC. Many said they left the meeting knowing the EPA would not help them.

Literature suggests the lack of political oversight and direction causes feelings of confusion, uncertainty, (Gill, Picou, & Ritchie 2012) and resentment for political institutions to arise (Cagney et al. 2016). Respondents further lost EPA oversight and direction when officials began operating on MCCC land and hosted private meetings with Coldwater residents. This further increased confusion, uncertainty, and resentment toward the EPA. More specifically respondents felt abandoned, which translated into little hope that the EPA would help their community. Respondents said they desperately wanted engagement from the EPA. When the EPA liaison arrived at the courthouse, some respondents recalled feeling reassured about the EPA's presence in their community. However, they said the liaison was unproductive because she had the same documents each week and gave very little information. Thus, residents felt the EPA chose a young woman of color to reduce the number of community members asking questions. As the EPA continued to be disconnected from the community, respondents knew they had to continue adapting to coal-based environmental stressors and future disasters.

These findings demonstrated experiences of those who wanted to challenge a coal-based disaster in coal country. These individuals could not resist coal-based environmental stressors. For one, coal ideology historically created divisions and pitted residents against each other in Martin County. This small portion of vocal residents felt like outsiders within their community. Thus, they were unable to utilize strong community support to directly challenge MCCC for their actions because the disaster was coal-based. MCCC further reduced their capacity by limiting details and disconnecting Coldwater residents from their community. The EPA also hindered their capacity through their lack of political oversight. Many respondents felt if they were unable to utilize community support, then they could utilize political support. However, they deemed the EPA useless when the agency failed to engage with the community, spoke down to them, and only supported MCCC and Coldwater residents. As they felt left behind by their community and decision makers, respondents reinforced their adaptive techniques to survive. However, 17 years later, the community began to resist coal-based environmental stressors alongside the respondents.

In the respondents' stories of Martin County, the community historically developed adaptive resiliency frameworks to endure the persistence of coal-based environmental stressors. As Russell said, "*fighting back has never been an option before the water quality crisis*." Following the tipping point of the water quality crisis, resiliency transformed from adaptation to resistance. Residents said this was the first community-wide resistance of coal-based environmental stressors in Martin County. Respondents claimed more community members became vocal and willing to resist stressors. Community members began to vocally call out government officials in public,

at fiscal court meetings, and at water meetings. Individuals even began to perform everyday acts of resistance (Collins 1990) like lighting their front yard on fire when the water company refused to fix lines and urinating in the courthouse's bathroom. The growing community base of vocal individuals influenced the creation of the grassroots organization, *The Martin County Concerned Citizens*, to direct community resistance and voice concern. This grassroots organization further elevated the water quality issue as a community-wide issue that affected everyone. Gaventa (1980) suggested following the decline of the coal industry, resistance would emerge. Many elements sparked this rise of vocal community members. These included the lack of perceived connections to the coal industry, long-term adaptation, visions of the future, and seeing family/community members sicken and die.

Resisting the actions of coal companies was a historical taboo in Martin County. However, community members were resisting the local government, not the coal industry. More specifically, respondents said their community did not express any connections between the coal industry and the water quality crisis. Some said if community members made connections between coal mining and the water quality crisis, they were not publicly voicing these concerns. Observations at water meetings further demonstrated this lack of connection, as no one in attendance mentioned anything related to coal mining. Respondents felt the lack of perceived connections between water and coal mining increased the number vocal residents in Martin County and thus, strengthened communal efforts of resistance. These findings do not suggest coal ideology, or support for the industry was diminishing in this community but further, demonstrate the power of the coal industry to halt resistance (Bell 2008; Bell 2013).

When populations link coal mining to the problem, like the spill, they become silent, passive, and accepting. When similar populations do not link a problem to coal mining, like the water quality crisis, they rose up, challenged oppressors, and resisted. Without perceived connections to the coal industry, grassroots organizing grew in Martin County.

Martin County residents resisted the water quality crisis to reduce long-term adaptation. The lack of resistance following the spill, not only resulted from coal ideology and support, but also from the immediate nature of the disaster. Once MCCC controlled the immediate impacts of the coal impoundment failure, community members felt the disaster was over, and life was back to normal. Thus, respondents said community members were not reminded on a daily basis of the disaster, nor its long-term environmental impacts. However, the water quality was not immediate, but silent. Respondents and those at water meetings all said poor water quality began roughly 50 years before the tipping point. So, poor water quality became a normal aspect of life in Martin County. Reinforcing normality long-term on a daily and monthly basis augmented a growing concern for poor water quality. Respondents and those at water meetings said long-term adaptation to poor water quality was exhausting and tiring. In response, the community slowly alleviated their long-term adaptation and resisted.

Martin County residents also began to resist poor water quality because they feared for their future in respect to the economic opportunity. At the time of data collection, Martin County lacked economic diversity. Literature suggests the concentration of coal-based environmental stressors deters outside economic investors in many parts of Central Appalachia (Scanlan 2010). Thus, the coal industry has exacerbated inequality and reduced economic diversity (Salstrom 1994). Even so, coal

mining has also historically played a significant role in the local economy of many Central Appalachian communities (Kaneva 2011), and coal's exodus from these communities will sink them deeper into economic hardship (Tallichet 2014). All respondents acknowledged coal's decline. At the time of data collection, the last company in Martin County was laying off workers. This terrified them because the only economic opportunity available in Martin County were minimum wage jobs. Those included in this research all spoke about the poor infrastructure as a significant barrier to future economic growth. Thus, resistance sparked to fix the infrastructure to bring in economic opportunity.

Residents also began to resist poor water quality because they feared for the health of their community. Literature suggests coal mining, and specifically MTR, increases health problems for Central Appalachians, like respiratory problems (Esch & Hendryx 2011; Knuckles et. al. 2013; Hendryx & Luo 2014), birth defects (Ahern et. al. 2011), cancer rates, and organ problems (Hendryx et. al. 2011; Hendryx 2013). This research supports prior literature through showing the strong perceived connections between a coal-based environmental stressor and health outcomes. The perceived widespread health disparities in their community scared them because it literally meant the death of Martin County. Martin County was more than a geographic location to these individuals. They saw their county as a collection of lifelong companions, history, strong relationships, memories, family members, and identity. Every time someone died or became sick, they lost more than a community member; they lost a part of their family. They also felt this problem was getting worse. To remedy this problem and protect their family, they resisted.

Throughout the interviewees' stories of Martin County, three elements influenced adaptation and hindered resistance capacity: the coal industry, an unsupportive community, and a lack of political oversight and protection. Following the spill, all three influenced the adaptation to coal-based environmental stressors and hindered their capacity to resist. However, with the water quality crisis, coal was leaving the community at the time of data collection, and the community had a growing supportive community. Thus, respondents believed only one element stood in their way of resistance: the lack of political oversight and protection. Resiliency scholarship suggests political support and oversight is crucial for overcoming disasters (Corey & Deitch 2011; Aldrich & Meyer 2015). Scholarship further suggests disaster impacts persist and communities lack direction without support from governments (Chamlee-Wright & Storr 2010; Gill, Picou, & Ritchie 2012). However, a gap in resiliency scholarship is an understanding of when political institutions actively resist the resiliency of a community following a disaster.

When Martin County began resisting the water quality crisis, respondents and those at water meetings said local government became defensive. Local officials began publicly claiming Martin County does not have a water quality problem and reducing the importance of their movement. Some included in this research recalled approaching local officials about the water quality crisis and officials did not listen, nor took them seriously; one official told a respondent to build a well if she did not like the water quality. These individuals suspected officials knew they were a part of the *Martin County Concerned Citizens* and thus, did not give them the time of day. Through interviews and observations at water meetings, residents suspected local officials were

afraid *Martin County Concerned Citizens* would uncover documented proof of their corruption. Uncovering documented proof of corruption was one central goal of the *Martin County Concerned Citizens*. They believed if they found proof, they could use it to resolve the water quality crisis. Another central goal was gaining the attention of state and local governments. However, both goals required going through the local government. Respondents and those at water meetings knew the associated risks with challenging the local government. These individuals were going up against powerful elites in Martin County. They feared those in power could at any moment threaten their employment, homes, family, and even life. As Morgan said, "*a lot of people around here would like to kill my ass*" summarizes this perfectly. These individuals knew what they had to do for the safety and future of their community. Thus, they continued to build strength in numbers and resist their officials. Even though they said many in the community remained fearful and did not resist, they were hopeful and optimistic for their movement.

Resiliency Conclusion:

Through the lens of resiliency, this research captured human responses to two disasters in the same community. More specifically, this research captured meanings, understanding, and perceptions associated with resiliency following a coal impoundment failure and on-going deteriorating water quality. Interviewing residents and observing water meetings afforded the opportunity to find similarities and differences associated with resiliency in a Central Appalachian community. Data obtained from these sources suggest one similarity between both disasters was that residents have historically engaged

in a resiliency process of adaptation needed to survive the externalities of coal-mining practices. Findings further suggest a fundamental difference between the disasters was the lack of another form of resiliency, resistance. As Martin County has historically adapted to both the fear of a future coal impoundment failure and poor water quality, residents began to resist the water quality crisis to reduce long-term adaptation and find a sustainable future.

A gap in resiliency scholarship is placing studies of resiliency within a community's historical context. Resiliency scholarship has utilized EJ frameworks to understand the associated risk with placing environmental stressors in marginalized communities, as well as the unequal paths of resiliency (Davidson et al. 2013; Abramson et al. 2014; Bergstrand et al. 2015; Henly-Shepard et al. 2015). EJ and resiliency literature further complement each other in showing the unequal power dynamics that hinder the ability of marginalized communities to negotiate environmental stressors. However, studies have limited discussions of the historical processes associated with the placement of environmental stressors, as well as historically rooted power dynamics in specific marginalized communities. Understanding the historical processes of a marginalized community provides a deeper understanding of the placement, continuation, and persistence of environmental stressors. This further provides the opportunity to understand how historical processes influence, hinder and limit the resilient capacity of a marginalized community.

Specifically, in Central Appalachia, the placement, continuation, and persistence of coal-based environmental stressors are not only because of the sub-regions socioeconomic status, but also historical forces. When the coal industry forcefully

entered the sub-region in the late 1800s, the industry exploited their presence and removed the control of resource extraction away from Central Appalachians (Caudill 1963; Lewis, Johnson, & Adkins 1978; Gaventa 1980; Salstrom 1994; Eller 1995; Bell & York 2010). Throughout the decades, the coal industry maintained their presence and power by establishing ideological control (Bell and Braun 2010; Lewin 2017), economic dependency (Kaneva 2011; Scanlan 2010), and supplying the nation with a cheap energy source (Burns 2007; Scanlan 2010). As a result of the industry's power, coal-based environmental stressors have expanded and increased following the creation of MTR mining (Scanlan 2010) and many Central Appalachians have become powerless to challenge and overcome these stressors within their community (Bell 2008; Bell & Braun 2010; Marshall 2010). Thus, the coal industry has historically made adapting to stressors normal.

The history of Central Appalachia provides a deeper understanding of how coal-based environmental stressors are normal and persist long-term in the sub-region. More specifically, coal-based disasters are common in Central Appalachia. Thus, studies of resiliency in Central Appalachia cannot disconnect history from research. Studying the spill and the water quality crisis together, in the broader historical context of Central Appalachia, afforded this research the opportunity to understand how historical forces caused and influenced the resilient capacity of Martin County following both disasters. Through interviews and observations at water meetings, residents spoke about the spill and water quality crisis concerning historic coal mining. The spill and the water quality crisis also resulted from the historically rooted power of the coal industry. Throughout the decades, the coal industry developed power relations over political intuitions and the

community to justify the placement, continuation, and persistence of coal-based environmental stressors in Martin County. Historical power relations further gave the industry the ability to ignore deteriorating water infrastructure, pollute water sources, place coal impoundments in the community, and cause community-wide disasters with minimal backlash from political institutions and the community. The power of the coal industry to cause such disasters in Martin County speaks to larger problems of power and powerlessness in Central Appalachia.

The history of Central Appalachia and Martin County further supports defining resiliency as a process and not as an outcome. Defining resiliency as an outcome assumes recovery always materializes and the resiliency quality of a community rests in their ability to bounce back to normalcy (Gilbert 2010; Aldunce et al. 2014; Bergstrand et al. 2015). Findings from this research suggest Martin County did not overcome the spill, nor the water quality crisis. Findings further suggest normalcy for residents is a historical adaptation to coal-based environmental stressors. In other words, those included in this research said they have lived with coal-based environmental stressors their entire life. Thus, this research provides more support for defining resiliency as a process to understand the complexity, multi-dimensionality, subjectivity, different paths of disaster recovery, and when communities never overcome impacts (Bergstand et al. 2015; Brown & Williams 2015; Cutter 2016). However, these findings further suggest studies cannot isolate resiliency processes to one disaster. Studying both the spill and the water quality crisis afforded the opportunity to understand how Martin County has historically engaged in a resiliency process of adaptation and finding ways to resist. In other words, residents felt these forms of resiliency existed before the spill and will exist beyond the water

quality crisis. Thus, studying the resiliency process following one disaster ignores, by extension its situation in the historical resiliency process of a marginalized community.

A constructivist grounded theoretical approach revealed subjective meanings, experiences, and understandings, which contributes to a more robust understanding of the concept of resiliency and how communities respond to singular and ongoing disasters. Resiliency scholarship argues resiliency is subjective and unique to an individual and community, as there are countless interacting systems impacting resiliency (Gil-Rivas & Kilmer 2016). Thus, this methodological approach afforded this research the opportunity to discover the subjective meanings, experiences, and understandings of resiliency with respect to two disasters in Martin County. The interviews and observations of vocal, resistant community members showed the deeply rooted nature of adaptation in Martin County. In Central Appalachia, where the coal industry has suppressed the voices of many, vocal and resistant residents are unique and rare (Bell 2008). Many individuals in the community refused interviews because they felt this research was anti-coal. Therefore, the meanings, experiences, and understandings captured in this research represent individuals who were not afraid to talk despite power structures. These individuals were highly critical of their community, political institutions, and the coal industry. They also said others in the community do not hold similar views of the disasters given the power structures over the community. These findings support literature that resiliency is subjective, but further suggests capturing meanings, experiences, and understandings of resiliency in Central Appalachia is reliant on vocal, resistant individuals of a community.

Research findings further support the importance of capital following disasters. Alongside social and political capital, some scholars argue human and economic capital are also crucial resources for resiliency (Abramson et al. 2014; Aldunce et. al. 2014; Cagney et al. 2016). However, human and economic capital were outside of the scope of this research because social and political capital emerged from research findings. More specifically, the interviews and observations further support literature that suggests social (Grube & Storr 2013; Bergstrand et al. 2015; Cagney et al. 2015), and political capital (Chamlee-Wright & Storr 2010; Bergstrand et al. 2015; Henly-Shepard et al. 2015) are crucial resources for resiliency. Inclusion of the history of Central Appalachian communities provides a deeper understanding of the reasons why these communities have been unable to benefit from or develop particular forms of social and political capital over time. Throughout the residents' stories of Martin County's resiliency, the lack of community support and political oversight were used to explain the community's inability to negotiate the placement of environmental stressors. Individuals said their community and political institutions historically supported the coal industry. As a result, this perceived support influenced their adaptation to coal-based environmental stressors and hindered their resistance capacity. However, when it came to discussions of the water quality crisis, residents felt their capacity to resist was stronger, more efficient, and powerful once they saw other fellow community members who resisted the placement of environmental stressors. Even though individuals lacked political oversight concerning the water quality crisis, respondents felt relieved to finally have the support of the broader community.

Lastly these findings challenge assumptions and stereotypes that Central Appalachians are lazy, backwards, and uncivilized (Massey 2007), like when Bill O'Reilly called Appalachia a region suffering from multigenerational poverty and laziness (Tabler 2009) Throughout interviews and observations at water meetings, Martin County residents said the coal industry has historically placed and expanded environmental stressors in their community. Concurrently, the industry hindered their capacity to negotiate these stressors through establishing coal ideology and influencing political institutions. These individuals have felt powerless to challenge and overcome the externalities of coal-mining, and thus historically adapted. As coal mining is leaving the region, many feared for their health and economic structure. However, coal's exodus also translated into more community support to resist stressors. They believed the water quality crisis was killing Martin County. At the time of data collection, contrary to stereotypes, the community was actively and tirelessly fighting and resisting poor water quality to save the lives of their children and community.

Towards A Theory Of Resiliency For Marginalized Communities:

A partial theory of resiliency emerged from findings. Even though this research examined one community, more research is needed to build on and support the emerged theory. This section provides a discussion of the components of the partially emerged theory. Refer to *Chapter 3: Theoretical Framework* for theoretical concepts, frameworks, and assumptions used in the emerged theory. The first component of this emerged theory is disaster resiliency is more than a social process of recovery. Disaster resiliency in marginalized communities occurs in two stages. The first stage appears to be adaptation, where marginalized communities develop survival techniques. The second

stage appears to be resistance, where marginalized communities deconstruct adaptation through social activism. Thus, resiliency for marginalized communities is both adaptation and resistance, as well as the social process of moving from a stage of adaptation to a stage of resistance, or survival to social activism.

The second component of the emerged theory is power dynamics create the adaptation stage. Through hegemony, those in power socially construct ideological frames, like the coal industry constructing coal ideology. Ideological frames make marginalized communities powerless and quiescence. The social construction of ideological frames is a historical process. Through historical habituation, powerlessness and quiescence become institutionalized. Once institutionalized, feelings of powerlessness and quiescence are externalized and reinforced as normal by members of a marginalized community. Over time, this process constructs a reality where adaptation is a normal and vital for survival following a disaster.

The third component of the emerged theory is political opportunities influence the movement from the adaptation stage into the resistance stage. Following political opportunities, like coal's exodus or the tipping point of a silent disaster, organic intellectuals emerge to counter frame hegemonic frames of adaptation. The emergence of organic intellectuals who counter frame realities of adaptation opens avenues for micromobilizing. Micromobilizing, like the *Martin County Concerned Citizens'* water meetings, organizes community members around a common framed goal, such as the water quality crisis. As a result, constituents and adherents emerge to move the social movement forward and recruit/convert bystanders into adherents. Thus, those

micromobilizing seek to create new processes of habituation to institutionalize and externalize a reality without frameworks of adaptation.

Even though those included in this research did not see themselves as activists, they were a part of an emerging social movement. Thus, categorizing these individuals according to McCarthy and Zald's (1977) levels of participation in a social movement is appropriate. At water meetings, three to four individuals always directed meetings and provided resources, such as information concerning water regulations. These three to four individuals were constituents of the social movement in Martin County. Alongside constituents, the remaining individuals in the audience were adherents. These individuals did not lead, nor provide resources, but indicated they were a part of the organization and social movement through their attendance and desire to challenge local government for the water quality. Also, at each meeting were bystanders, or individuals pulling into the parking lot intrigued by the purpose of water meetings. One individual, in particular, pulled into the parking lot and asked, "*is this where we are supposed to learn about the water*?". After each meeting constituents requested tasks from adherents, like testifying in Frankfort or helping the researchers from the University of Kentucky conduct research. This suggests constituents were converting adherents into constituents. Also, constituents and adherents alike were continually approaching bystanders in the parking and asking them to attend the meeting. This, in addition to posting fliers around town, on Facebook, and in the Mountain Citizen newspaper before each water meeting, suggest constituents and adherents were converting bystanders into adherents. These individuals were micromobilizing to create new processes of habituation to institutionalize and externalize a reality without poor water quality.

Supporting And Strengthening Literature On Coal Impoundments Failures:

Erikison's (1978) work following Buffalo Creek shed light on how coal impoundment failures cause a loss of community, literally and psychologically. As the disaster destroyed homes and killed individuals, it also reduced community as a state of mind for many living alongside Buffalo Creek. Even though the failure in Martin County did not damage homes and take the lives of residents, it diminished feelings of community. The critical difference in Buffalo Creek and Martin County rests in the isolated nature of Martin County's disaster. Everyone in the surrounding community and Buffalo Creek saw the impacts. This was not the case following the Martin County spill because it isolated to two residential hollows. The tactics employed by the industry and the EPA to hide and conceal the disaster caused a reduction of community. This research builds on Erikson's work by showing how coal companies have the power to cause uncertainty, fear, and powerlessness following a coal impoundment failure. It also strengthens literature by showing how these elements influence resilient capacity.

Sociological literature on the slurry spill in Martin County found community members felt excluded from decision-making (McSpirit, Scott, & Hardesty 2005), became fearful of long-term health and environmental impacts (Mcspirit et al. 2007) and distrusted government agencies and the coal industry (Scott et al. 2005). Residents lack trust in political institutions (Scott et al. 2012). This research supports each of these key themes. Feelings and mistrust toward political institutions persist 17 years later. However, this research suggests trust in the coal industry has returned. This research provides deeper understandings of the long-term impacts of the spill. Residents still do not feel prepared for another disaster, if it were to occur. Many feel the spill impacted

their water supply but place blame on local officials, rather than the coal industry. Coal ideology persists in the community, suppressing voices and silencing populations long-term. The memory of the spill is considered suppressed by respondents included in this research.

The documentary *Sludge* (2005) told the story of the Martin County following the spill. More specifically, this documentary interviewed residents and contained videos and images of the disaster in Coldwater and Wolfcreek. Through interviews, this research adds to this documentary in three ways. One, the documentary mentions slurry inundated Coldcreek and Wolfcreek, but does not clarify that slurry contained to these two hollows. More specifically, the documentary does not show the barricade MCCC used to prohibit community from entering these residential hollows. Secondly, the documentary does not show the recovery, or *resiliency process* of this community. More specifically, the documentary limits scope to the day of and days following. It does not mention elements of recovery from the perspectives of residents. Thus, the documentary does not show residents fearing or preparing for future disasters. Lastly, the documentary does not mention the strong support for coal in this community, one significant barrier residents faced when wanting to challenge MCCC.

Informing Policymakers:

Martin County residents included in this research have lost hope in the political process. They all felt government agencies and officials have historically abandoned them, influenced adaptation to coal-based environmental stressors, and hindered their resistance capacity. However, these perceptions and constructions of reality are not isolated from objective realities. By placing their constructions of reality towards

political institutions within the context of objective realities, we can see their perceptions have material impacts (Best 2007). For example, following the 2016 Presidential Election, President Donald Trump won Kentucky's electoral votes. Roughly, 88 percent of those who voted in Martin County, voted to elect Donald Trump (Commonwealth of Kentucky 2017). Out of many reasons, President Donald Trump won because he challenged the political structures and career politicians. This appealed to many who have lost trust and hope for the political process (Krieg 2016). The voter data, as well as the data from this research, may suggest a connection between President Trump's rise in the U.S and a lack of trust in political structures.

In *The Semisovereign People: A Realist's View of Democracy in America*, E. E. Schattschneider (1975) argued the U.S. political system operates by a handful of individuals who favor elites and special interest groups, like the coal industry. Favoring elites and special interest groups only serves the interests of these parties and ignores the issues of citizenry. This fragments democracy, makes people feel powerless, and has material impacts. For example, President Trump' rise is a natural outcome of a fragmented democracy because those who feel disconnected from the political process seek to challenge the status quo (Krieg 2016). Schattschneider argued for enhancing/repairing democracy by shifting the power dynamics in the political process through hearing the issues of ordinary folks and giving them real policy options. Even though Schattschneider (1975: 133) said "nobody knows enough to run the government" he thought hearing the voices of individuals could enhance democracy. Thus, the voices in this research have the power to inform policy.

The resiliency process and stories of Martin County residents informs policy. This research documented dialogue from Central Appalachians detailing troubles and solutions to their troubles. Without political oversight, stressors will continue to impact Martin County. A lack of political oversight will also sustain resentment for government agencies and decision makers. The individuals included in this research were knowledgeable about issues and wanted effective political engagement. Bringing Martin County residents to the table and engaging in policy decisions can help create a more representative political system, as well as a sustainable future for Central Appalachia. This research, as well as participants in this research, calls for government agencies and decision makers to work directly with this community, and all Central Appalachian communities, to find ways to fix their water quality crisis, health disparities, and economy. Engaging with Martin County residents also has the opportunity to gain political trust.

One option for enhancing fragmented democracy is for government agencies and decisions makers to directly engage with residents of Martin County through deliberative policy analysis. Deliberative policy analysis challenges top-down approaches and advocates for inclusionary methods (Hajer & Wagenaar 2003; Dietz & Stern 2008). Inclusionary methods focus on introducing new actors, themes, and spaces for those previously excluded from the policy process (Hajer & Wagenaar 2003). It seeks to enhance our broken democratic system and bring people to the table and hear their solutions. Dialogue, a highly valued component of the process, highlights passions, feelings, and values towards issues and policy solutions. However, there is not a uniform way of conducting deliberative policy analysis. It is appropriate and useful for various

stages and levels of the policy process. This ranges from information exchange to creating policy (Hajer & Wagenaar 2003). It remains an underutilized form of policy and arguably theoretical, but this does not diminish the importance of including silenced voices.

Future Research:

This research collected interview and observational data between the months of May and November in 2017. Following data collection, posts on the *Mountain Citizen's* Facebook page showed a video of police officers arresting a man after cursing during testimony, countless posts claiming their water was shut off for weeks, and posts claiming local government plans to increase their monthly water bill. The significance of these posts shows the urgency, seriousness, and importance of this resistance in Martin County. Solutions to this problem are multifaceted and complex, and this research serves as a starting point for understanding resistance in Martin County. Overall, more research is needed to understand this ongoing, evolving problem in Martin County. Through data collection, avenues for future research emerged that would provide a deeper understanding of resiliency in Martin County and Central Appalachia.

The first is the *Mountain Citizen's* Facebook page. This Facebook page contains detailed information concerning experiences, stories, depictions of the water, updates, views, and opinions. Content analysis of this Facebook page can provide a more in-depth understanding of resistance in Martin County. Secondly, quantitative research can also provide a more in-depth understanding of the water quality crisis. Through collecting primary and analyzing secondary data, quantitative research can uncover concentrations of health disparities, as well as the types of diseases in Martin County. Next, this

research calls for Participatory Action Research. Research that participates with Martin County residents focused on action can empower residents and provide resources. Next, this research calls for more research on Central Appalachian communities during coal's exodus. Coal's exodus will sink these communities deeper into economic hardship. More research on best practices can help other communities find a just transition. Lastly, this research calls for more research on the partial emerged theory of resiliency. More research can build on the theoretical framework.

Concluding Remark:

Alongside challenging the concentration of environmental stressors in Martin County, Central Appalachia, and across the U.S., we, as a nation, need to address why we accept the existence of environmental stressors. Since the Industrial Revolution, we have used fossil fuels to power and grow the U.S. economy. As a result, we have become dependent on fossil fuels (Cable 2012; Ciplet, Roberts, & Khan 2015; Dunlap & Brulle 2015), the same way Martin County and many Central Appalachian communities have become dependent on coal extraction. Dependency on fossil fuels is increasing environmental stressors across the globe and causing climate change (Giddens 2012). This requires our immediate attention. Climate change is driven by historical inequities and has unequal impacts on race, income, and gender. Thus, eradicating the impacts of climate change will require challenging institutionalized political, economic, and social contexts of society (Dunalp & Brulle 2005). As addressing environmental stressors and climate change will be troublesome, it is necessary for the survival of all humans. If environmental stressors, inequality, and climate change are not addressed, everyone will

develop adaptive resiliency. Climate change is the example showing how environmental stressors impact everyone, not just marginalized communities, like Martin County.

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APPENDICES:

APPENDIX 1: INFORMED CONSENT FORM

"Appalachian Resiliency and the Martin County Sludge Spill: Looking Back to Move Forward"

Investigators:
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Site: The Appalachian Region

Introduction and Background Information

You are invited to participate in a research study. The study is being conducted by Dr. Lauren Heberle and by Adam Sizemore, a doctoral student in the Department of Sociology. The study is sponsored by the University of Louisville, Department of Sociology. The study will take place in a Kentucky county and approximately 50 subjects will be invited to participate.

Purpose

The purpose of this study is to learn how the Martin County community experienced and continue to experience the sludge spill of 2000. This is intended to gain knowledge on the long-term impacts of sludge spills.

Procedures

In this study, you will be asked to participate in an interview, taking around one-hour to complete. This interview could either be in-person or over the phone. Questions will be asked regarding various topics about the sludge spill. You will also be asked to participate in a short survey, taking around 1-2 minutes to complete. Interviews will be audio recorded. You may be invited to join a group discussion with others from Martin County. The group discussion will also be audio recorded. At any time, you are free to decline to answer any question that

may make you feel uncomfortable or that you choose not to answer. You also have the right to deny the invitation for the group discussion, if applicable.

Potential Risks

There are risks associated with this research. The risk is that the researchers will have whatever information you feel freely to disclose. The researchers guarantee that your information will not be used in any way you do not approve of. Other than that, there are no foreseeable risks other than possible discomfort in answering personal questions. There are no foreseeable risks, although there may be unforeseen risks.

Benefits

The possible benefits of this study include informing others the long-term impacts of a community after a sludge spill. It will also provide information on how Martin County residents overcame these impacts since the spill. This information can be used to help other communities overcoming similar events. The information collected may not benefit you directly. The information learned in this study may be helpful to others.

Payment

You will not be compensated for your time, inconvenience, or expenses while you are in this study.

Confidentiality

Total privacy cannot be guaranteed. We will protect your privacy to the extent permitted by law. If the results from this study are published, your name will not be made public. Once your information leaves our institution, we cannot promise that others will keep it private.

Your information may be shared with the following:

- The University of Louisville Institutional Review Board, Human Subjects Protection Program Office, Privacy Office, others involved in research administration and compliance at the University, and others contracted by the University for ensuring human subjects safety or research compliance
- The local research team
- People who are responsible for research, compliance and HIPAA oversight at the institutions where the research is conducted
- Government agencies, such as:
    - Office for Human Research Protections

- Office of Civil Rights

Security

Your information will be kept private in a locked office, in a locked filing cabinet or password protected computer. You will be given a fake name to protect your identity when results of the study are presented.

Voluntary Participation

Taking part in this study is voluntary. You may choose not to take part at all. If you decide to be in this study you may stop taking part at any time. If you decide not to be in this study or if you stop taking part at any time, you will not lose any benefits for which you may qualify.

Contact Persons

If you have any questions, concerns, or complaints about the research study, please contact Adam Sizemore at (606) 356-2660 or Dr. Lauren Heberle at (502) 852-4749.

Research Subject's Rights

If you have any questions about your rights as a research subject, you may call the Human Subjects Protection Program Office at (502) 852-5188. You may discuss any questions about your rights as a research subject, in private, with a member of the Institutional Review Board (IRB). You may also call this number if you have other questions about the research, and you cannot reach the study doctor, or want to talk to someone else. The IRB is an independent committee made up of people from the University community, staff of the institutions, as well as people from the community not connected with these institutions. The IRB has approved the participation of human subjects in this research study.

Concerns and Complaints

If you have concerns or complaints about the research or research staff and you do not wish to give your name, you may call the toll free number 1-877-852-1167. This is a 24 hour hot line answered by people who do not work at the University of Louisville.

Acknowledgment and Signatures

This informed consent document is not a contract. This document tells you what will happen during the study if you choose to take part. Your signature indicates that this study has been explained to you, that your questions have been answered, and that you agree to take part in the study. You are not giving up any legal rights to which you are entitled by signing this informed consent document. You will be given a copy of this consent form to keep for your records.

_____ _____

Subject Name (Please Print) Signature of Subject Date Signed

_____ _____

Printed Name of Legally Authorized Representative (if applicable) Signature of Legally Authorized Representative Date Signed

_____

Authority of Legally Authorized Representative to act on behalf of Subject

*Authority to act on behalf of another includes, but is not limited to parent, guardian, or durable power of attorney for health care.

_____ _____

Printed Name of Person Explaining Consent Form (if other than the Investigator) Signature of Person Explaining Consent Form Date Signed

Printed Name of Investigator	Signature of Investigator	Date Signed

List of Investigators:

Adam Sizemore	(606)-356-2660
Dr. Lauren Heberle	(502) 852-4749

APPENDIX 2: INTERVIEW GUIDE

Interview Questions

1. What was your experience the day of the spill?
    a. What did you hear about the spill the day it happened?
    b. When did you hear about it?
    c. Were you in its path?
    d. How did you hear about it?
    e. Where were you?
    f. What were the days after the spill like?
2. Who offered support immediately after the spill?
    a. Did anyone contact you? If so, who?
    b. Government agencies?
    c. Local officials?
    d. Coal industry?
    e. Community members?
    f. How did people whose house was surrounded by the sludge get out?
3. Did the spill impact your life personally? How so?
    a. How far away do you live from where the spill happened?
    b. Did it damage house?
    c. Did it damage your land? Do you garden/farm?
    d. Did you have to move?
    e. Did you have to pay for damages?
    f. Did it damage your health?
    g. Did it contaminate your water?
4. Did the spill impact your family and friends? How so?
    a. How far away do they live from where the spill happened?
    b. Did it damage their house?
    c. Did it damage their land? Do they garden/farm?
    d. Did they have to move?
    e. Did they have to pay for damages?
    f. Did it damage their health?
    g. Did it contaminate their water?
5. How do you think the spill impacted others individuals within the community?
    a. Do you think impacts decrease the farther you live from the spill?
    b. Do you think people moved out of the county?
6. How do you think the spill impacted Martin County?
    a. Did businesses shut down? Are they still shut down?
    b. Did people move?
    c. Was anything destroyed?
    d. Do you attribute it problems with the economy?
    e. How did it change its relationship to coal industry?
    f. How do you think it impacted trust in the government?
    g. How did it change relationships within the community?

7. Tell me about some of the problems you faced when overcoming these impacts?
    a. Immediate?
    b. Ongoing?
    c. How did you overcome the impacts?
8. Tell me about some of the problems you saw individuals face when overcoming these impacts?
    a. Immediate?
    b. Ongoing?
    c. How did they overcome the impacts?
9. Tell me about some of the problems you saw Martin County face when overcoming these impacts?
    a. Did people come together?
    b. Did you see anyone help others? How so?
    c. Did you help anyone? How so?
    d. Was there any conflict amongst community members? If so, what kind?
10. Do you still experience these impacts today?
    a. What impacts?
    b. How do you plan on overcoming them?
    c. Do you think you ever will?
11. Do you see the community experiencing these impacts today?
    a. What impacts?
    b. How does the community plan on overcoming them?
    c. Do you think they ever will?
12. Do you think things are "back to normal"?
    a. What does "normal" mean to you?
    b. Is there a "new normal"?
    c. If so, when do you think it went "back to normal"?
    d. How long did it take to clean up the spill?
13. How do you feel this spill prepares your community for a similar event in the future?
    a. What about yourself?
    b. What about others you know?
    c. Do you think it will happen again?
    d. If it does, do you think you are better prepared?
    e. What advice would you give the government to stop an event like this happening again?
    f. What have you learned from this that you would like to tell other communities who may encounter something similar?
    g. Have you seen any local organizations emerge after the spill?
    h. Are you apart of any initiatives focused on improving the community?
14. How do you think the spill impacted your relationship to the community?
    a. Did it bring you closer?
    b. Did you meet new people from the community? Are you still in contact with them?

15. How often do you think back on that day?
    a. Tell me about that. What do you think about?
16. Please tell me about some conversations you have had with other community members about it?
    a. How often do you hear people referencing it?
    b. Does this still occur? How often?
    c. If it has reduced, when did it reduce?
17. What did you gain from the spill?

Interview Grouping by Theme:

Experience of the Spill: 1,2
Individual and Community Impacts: 3, 4, 5, 6,
Barriers of individual and Community: 7, 8, 9
Continuing Impacts of Individual and Community: 10, 11, 12, 14, 15, 16
Preparing for the future: 13

APPENDIX 3: SURVEY

1. What is your age? _____

2. What is your gender?
    a. Female
    b. Male
    c. Other
    d. Prefer not to say

3. What is the highest level of education you have completed/received? *(Please circle one)*
    a. Less than High school
    b. High school degree or equivalent
    c. Some college, no degree
    d. Bachelors Degree
    e. Advanced Degree

4. What is your race? *(Please circle one)*
    a. White
    b. Black or African-American
    c. Hispanic
    d. American Indian or Alaskan Native
    e. Asian
    f. Native Hawaiian or other Pacific Islander
    g. Multiple races
    h. Other

5. What is your current employment status? *(Please circle one)*
    a. Employed Full Time (35 hours average a week)
    b. Employed Part Time (Less than 35 hours average a week)
    c. Unemployed
    d. Retired
    e. Disabled
    f. Other

6. What is your marital status? *(Please circle one)*
    a. Married
    b. Divorced
    c. Widowed
    d. Separated
    e. Never Married
    f. Other

7. Number of people living in household? _____
    a. How many are children? _____

8. How many years have you lived in Martin County? _____

9. Where were you born? *(Please specify City, County, and State)*

   _____

10. What is your yearly household income (job, government benefits, child support etc.)? *(Please circle one)*
    a. $0-$9,999
    b. $10,000-$19,999
    c. $20,000-$29,999
    d. $30,000-$39,999
    e. $40,000-$49,999
    f. $50,000-$59,999
    g. $60,000-$69,999
    h. $70,000-$79,999
    i. $80,000-$89,999
    j. $90,000-$99,999
    k. $10,000 or more

11. Are you currently or have ever been employed in the coal industry? *(Please circle one)*
    a. *Yes*
    b. *No*

    *If answered yes, what years have you worked there?

    _____

12. Do have family currently or ever employed in the coal industry? *(Please circle one)*
    a. Yes
    b. No

    *If answered Yes, what is your relationship to this family member(s)? (*If multiple members, please list your relationship to each*)

    _____

Appendix 4: Slurry from the Spill of 2000

This was given to me by a respondent. They said they took a sample on October 11, 2000 and it has been sitting in their basement ever since.

CURRICULUM VITA

David Adam Sizemore, MA, PhD Candidate

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Louisville, Ky 40214
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Education

Bachelor of Sociology, December 2012-Morehead State University

Bachelor of Philosophy, December 2012-Morehead State University

Masters of Sociology, May 2014-Morehead State University

Ph.D. Applied Sociology - University of Louisville 2018, *Expected*

Major: Public Policy

Minor: Environmental Sociology

Work Experience

Center for Environmental Policy and Management (CEPM)
Sociology Graduate Research Assistant
Louisville, Ky, October, *2014-Present*

- Researched literature, retrieved/cleaned data, and worked with a multidisciplinary research team on the *Brownfields Community Benefits Assessment Project and Toolkit* for the Environmental Protection Agency
- Authored Practice Guide #38 "*Establishing the Use of SNAP at Farmers' Markets*"
- Co-Authored two reports/toolkits for the Environmental Protection Agency: *Compendium Report: Organics Recovery Toolkit for Colleges and Universities* and *Organics Recovery Program Development Tool for Colleges and Universities*.
- Worked with city and community members to draft *The Germantown Rail Corridor Plan*.
- Researched data and co-authored the *State of Metropolitan Housing Report* (2014, 2015, 2016, and 2017).
- Cleaned data for a process evaluation of the Environmental Protection Agency's Small Waters Program.
- In charge of web design and maintenance
- Authored CEPM's quarterly newsletters
- Researched/applied local, state, and federal environmental policies for various reports and projects.
- Responsible for working with research teams that collect, analyze, and present data for government agencies and community members.

- Responsible for contacting and communicating with government agencies, local organizations, and community members.

University of Louisville/USDA
Researcher/Program Evaluator
Louisville, Ky, January 2014-2017

- Worked with Dr. Lisa Markowitz and a multidisciplinary research team to conduct a process evaluation of farmers' markets' EBT/SNAP program within Louisville, Ky.
- Responsible for communicating with local government officials and market managers.
- Conducted semi-structured interviews with market vendors.
- Administered market surveys to market patrons.
- Administered market surveys to patrons using Debit/EBT.
- Responsible for inputting, cleaning, analyzing and interpreting data.
- Responsible for transcribing market vendor's interviews.
- Responsible for creating tables and charts for Louisville Metro and the USDA.
- Responsible for working, conversing, communicating, meeting and planning research with a team.

Morehead State University
Sociology Graduate Teaching Assistant
Morehead, Ky, *August 2013 – May 2014*

- Co-taught two courses:
  - SOC 101: Introduction to Sociology
  - SOC 665: Environmental Sociology
- Analyzed and cleaned incoming freshman survey data for the Provost.
- Provided assistance in preparing course material.
- Assisted professors in administrating coursework, engage students in discussion, course material, exams and grading.
- Prepared preliminary material for course creation (Sociology of Animals and Society).
- Conversed with professors and gave input on sociological material used in courses.
- Responsible for being flexible in administering a course whenever a faculty member was in need.

Rowan County School System
Substitute Teacher/Mathematics Tutor
Morehead, Ky, *January 2013 – August 2014*

- Tutored students in Algebra I, Geometry, Algebra II, Pre-Calculus, and Advanced Calculus.
- Assisted students in developing new and old strategies to excel in their courses.
- Supervised and conducted summer school for 2014.
- Taught in middle/high school classrooms.

Publications and Professional Reports

Lauren Heberle, Brandon McReynolds, Steve Sizemore, **Adam Sizemore,** and Theo Malone**.** 2017. *State of Metropolitan Housing Report 2017*. Center for Environmental Policy and Management at the University of Louisville. Prepared for the Metropolitan Housing Coalition, Louisville, KY. *Forthcoming*

Lauren Heberle, Brandon McReynolds, Steve Sizemore and **Adam Sizemore.** 2016. *State of Metropolitan Housing Report 2016*. Center for Environmental Policy and Management at the University of Louisville. Prepared for the Metropolitan Housing Coalition, Louisville, KY.

Sizemore, David Adam. 2016. *Practice Guide #38- Establishing the Use of SNAP at Farmers' Markets*. Center for Environmental Policy and Management at the University of Louisville. Prepared for the Center for Environmental Policy and Management and the Environmental Finance Center.

Pompei-Lacy, Andrea, **Adam Sizemore**, Lauren Heberle, and Carol Norton. 2016. *Organics Recovery Program Development Tool for Colleges and Universities*. Center for Environmental Policy and Management at the University of Louisville. Prepared for the Environmental Protection Agency Region 4.

Pompei-Lacy, Andrea, **Adam Sizemore,** Lauren Heberle, and Carol Norton. 2015. *Compendium Report: Organics Recovery Toolkit for Colleges and Universities*. Center for Environmental Policy and Management at the University of Louisville. Prepared for the Environmental Protection Agency Region 4.

Norton, Carol, Lauren Heberle, Allison Smith, Ryan Fenwick, Daniel Weinstein, Kent Pugh, and **Adam Sizemore.** 2015. *State of Metropolitan Housing Report 2015*. Center for Environmental Policy and Management at the University of Louisville. Prepared for the Metropolitan Housing Coalition, Louisville, KY.

Norton, Carol, Lauren Heberle, Allison Smith, Ryan Fenwick, Daniel Weinstein, Kent Pugh, and **Adam Sizemore.** 2014. *State of Metropolitan Housing Report 2014*. Center for Environmental Policy and Management at the University of Louisville. Prepared for the Metropolitan Housing Coalition, Louisville, KY.

Invited Presentations

Sizemore, David Adam. "Appalachian Resiliency: Life After the Martin County Sludge Spill**."** Presented at the Appalachian Studies Conference, Re-stitching the Seams: Appalachia Beyond Its Borders, April 2018. *Forthcoming*

Sizemore, David Adam. "Growing it My Way": A Qualitative Analysis of Rural Organic Growers." Invited to speak to Sociology 232: Social Problems at Morehead State University, April 28, 2012.

Presentations

Sizemore, Adam, Brandon McReynolds, and Theo Malone. "Affordable Housing for Louisville's Aging and Disabled Populations." Presented at the 2017 Optimal Aging Conference, June 2017.

Sizemore, David Adam, and Laura Valentine. "Farmers' Market Promotion Program: A View from a Church Parking Lot in Kentucky." Presented at the Society for Applied Anthropology Annual Conference, April 2017

Sizemore, David Adam and Andrea Pompei-Lacy. "Composting Collaborations and Planning Implications." Presented at the American Planning Association's (APA-KY) 2016 Spring Conference, May 2016

Sizemore, David Adam. "Growing it My Way": A Qualitative Analysis of Rural Organic Growers." Presented at the Mid-South Sociological Annual Conference, November 2014.

Professional Service:

Note facilitator for the Environmental Protection Agency's Environmental Justice Workshop in Louisville, KY: 2015 & 2016

Environmental Blogger for the "Friends of Limestone" nonprofit organization.

Sizemore, Adam. June, 2017. "Preservation and Conservation." *Friends of Limestone*.
Sizemore, Adam. July, 2017. "Meet Our Environmental Blogger!". *Friends of Limestone*.
Sizemore, Adam. August, 2017. "Limestone, Extraction, and the Environment". *Friends of Limestone.*
Sizemore, Adam. September, 2017. "Lakes of Kentucky". *Friends of Limestone*.
Sizemore, Adam. October, 2017. "So you want to get involved? Environmentalism in Kentucky!". Friends of Limestone.

Professional Organizations

Member of the Society for Applied Anthropology- 2017
Member of the American Sociological Society- Since 2016
Member of Southern Sociological Society- 2016
Member of Mid-South Sociological Association- Since 2014
Member of Kentuckians for the Commonwealth- Since 2014
Member of Floyds Fork Environmental Association- Since 2014

Skills

-Excellent experience with using qualitative research methods
  -Masters' Thesis
  -Course project for SOC 618: Qualitative Methods
  -Various projects with the Center for Environmental Policy and Management
  -Farmers' Market USDA Grant Project
  -Dissertation Research, *Expected 2017*
-Knowledge and application of statistical methods
-Experience with multitasking multiple projects and research sources simultaneously

-Experience with analyzing, compiling, and cleaning data
-Excellent knowledge of SPSS
-Excellent knowledge in Plone
-Excellent skills with computers
-Excellent skills in Microsoft Office

Research Interests/Teaching Interests

-Public/Social Policy
-Environmental Sociology
-Qualitative Methodology

Service

Treasurer for the Sociology Graduate Student Association UofL-Since 2016

Awards

-Outstanding Graduate Student Award, Morehead State University, 2014
-John Stuart Mill Award, Morehead State University, 2012

Professional References

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