Intersections Between Social Work and Public Administration:

A Case Study of Urban Water Poverty

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SOWK Master's Thesis

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Spring 2022

Abstract

Despite infrastructure advances, water testing, and environmental policies, there are still areas in the United States that lack clean water. Some communities are negatively impacted by policies, location, socioeconomic status, water obtainment methods, and racial, ethnic, or cultural differences. Social workers desiring to intervene may not know where to begin. To identify potential interventions, this case study examines how the community of Green Tree Estates gained access to clean water through advocacy efforts and community organizing. This community, located within a large city in Texas, is a previously annexed, small mobile home community consisting of a Hispanic, Spanish speaking population that relied on contaminated well water. The study consisted of five participant interviews with key informants and a corresponding qualitative data analysis to identify the problems, how those involved worked through the situation, and how similar situations might be better handled. Results show that participants had mixed feelings about how well the situation was handled by the different parties involved. Advocates empowered residents who played immense roles in advocating for themselves, leading community organizing efforts, and finding solutions. This study's implications include identifying the potential roles of social workers and other advocates, residents, and public administrators in helping communities that lack clean water. Social workers should help empower community residents to advocate for themselves, ensure their mental health needs are addressed, and help coordinate community organizing efforts between all the stakeholders involved. Social workers should also promote effective and respectful communication, address language and cultural barriers, and advocate for policy changes.

Keywords: Social work, public administration, green social work, water poverty, water scarcity, environmental justice, advocacy, policy

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The natural environment has a large effect on people's health, safety, and wellbeing. Natural resources including water, food, and fresh air may not be readily available in certain areas. This can cause competition and power struggles for resources. Those most negatively affected tend to be of lower socioeconomic classes and racial minority groups (Woo et al., 2019). For instance, housing located near factories is often more affordable than housing located in less industrial areas. Therefore, low-income households in a certain region may not have much of a choice but to live near factories where they are exposed to harmful pollutants in the air, soil, groundwater, and rainwater (Woo et al., 2019). This is an example of environmental injustice.

Environmental justice is a broad term relating to ensuring that people have adequate access to natural resources. This is often done by mitigating negative effects caused by weather, pollution, global warming, and other factors that often have human causes. A key component of environmental justice includes ensuring that everyone has opportunities to be involved in decisions affecting their surrounding natural environment. Environmental justice work often involves advocating for communities with high poverty rates and whose majority of residents are of color. Such advocacy is vital to mitigate environmental risks and is necessary because these communities often lack acknowledgement and political strength (Brennan et al., 2017).

Because environmental justice has been recognized as a social issue, the field of Green Social Work was created. Social workers in this realm often collaborate with environmental activists to enhance political, social, and ecological techniques in current social work practices (Noble, 2016). Examples of Green Social Work include advocating for policies that help preserve the natural environment, helping ensure that communities of color have access to

natural resources (e.g., clean water, parks, and green space), and making sure that environmental policy decisions made do not disproportionately affect the health and wellbeing of low-socioeconomic groups.

Social workers have a duty to challenge social injustices (National Association of Social Workers, 2017). However, the social work profession has been slow to react to environmental injustice, which is one of the reasons why the field of Green Social Work remains underdeveloped (Jarvis, 2019). It can be hard for social workers to find adequate educational materials, previous research, or resources to properly prepare for and intervene in situations where client populations face struggles with their surrounding natural environment (Jarvis, 2019). To help expand this field of practice, this study examines the situation of a Hispanic and predominantly Spanish-speaking community in Texas that experienced disenfranchisement and long-term water poverty because they lacked collective and political power and adequate support from advocates. The goal of this research is to explore ways that social workers could have intervened in this situation to produce smoother outcomes, such as advocacy methods and any missed opportunities for advocacy. The findings can be used to identify suitable intervention strategies that could translate to similar situations social workers may encounter in their own communities.

To preface some of the background information discussed regarding environmental justice and land use practices, it should be noted that environmental issues can affect anyone regardless of race, ethnicity, wealth, or age (U.S. Global Change Research Program, n.d.). Depending on weather patterns, local development plans, regional location, city size, and local politics, anyone can be affected by environmental concerns from wealthy white people in suburbs to low-income communities of color in urban areas (U.S. Department of Commerce,

2021; Noble, 2016). In the same vein, modern zoning and other land use practices may have nothing to do with racism, classism, environmental justice, or water poverty. In fact, many zoning and water source predicaments are a result of political and economic power struggles among developers, water providers, water districts, and cities, which can have detrimental effects on low-income residents (B. Hart, personal communication, November 15, 2022). However, disparities between different races, ethnicities, and income classes are evident, especially when accounting for the effects of COVID-19. This study emphasizes how communities of color are disproportionately affected by environmental concerns affecting their health and overall well-being and serves as a clear call to action for organizations across the country to address such needs in their communities.

Literature Review

Environmental Justice

To adequately understand present day environmental justice issues, it is important to look at the contextual history of environmentalism and ecologism. Environmentalism approaches environmental problems from a managerial perspective and claims that those problems can be fixed without foundational changes in societal or economic principals. Ecologism is of the viewpoint that in order for humans to maintain enjoyable lives, there needs to be exponential changes in how humans interact with the world around them, including politically and socially (Powers & Rinkel, 2017). Environmentalism frameworks highlight natural resources and biodiversity found in the ecosystem (Philip & Reisch, 2015). In contrast, environmental justice frameworks revolve around the experiences of groups of people who are most affected by environmental degradation. Environmental justice aims to empower such groups to actively take part in decision processes that affect their surrounding environment (Philip & Reisch, 2015).

For purposes of this discussion, it is also important be mindful that, for reasons that will be explained in more detail later, those who are white are more likely to live in areas of higher socioeconomic status and tend to have more time and money for certain leisure activities than those who are Black/African American or Hispanic. With this said, early environmentalism movements were primarily focused on wildlife preservation. These supporters tended to be wealthy white populations who wanted to enjoy the outdoors in national parks. This neglected those living in urban areas because those locations were seen as physically deteriorating and of "moral decay," causing many lower-income communities to view environmentalism "as elitist" and that the movements benefit "supporters while imposing costs on them" (Philip & Reisch, 2015, p.474). In other words, in previous decades, more emphasis was placed on protecting the environment for the environment's sake, to the benefit of natural ecosystems, without a spotlight on how human life is also grossly impacted by environmental concerns. The major governmental initiatives undertaken in the 1960s and 1970s to promote environmental reform did not include addressing the environmental justice concerns that affected minorities and lower-class people (Philip & Reisch, 2015). This oversight may have contributed to disenfranchised groups being more suspectable to environmental injustices.

Nowadays, conversations about environmental justice are more likely to center around how humans are impacted by their surrounding natural and built environments, the extent to which other humans play a role in positive or negative environmental effects, and ensuring that people can live in a safe and healthy environment with sufficient access to necessary natural resources (Philip & Reisch, 2015). These conversations are also taking place in the same context of discussions around racial/ethnic disparities, focusing on how people of color often require equitable access to healthy environments.

The Environmental Protection Agency defines environmental justice as "the fair treatment and meaningful involvement" of every person (no matter their color, race, nationality, or amount of income) when it comes to the creation, implementation, and execution of environmental policies, regulations, and laws (Philip & Reisch, 2015, p. 474). The opposite of environmental justice is environmental injustice, which involves situations in which environmental justice principles have been violated. These situations often deal with community members not having supports and resources they need in their surrounding environment (Brennan et al., 2017). Examples may include anything from not having access to clean water to losing their homes in extreme weather events caused by climate change.

Environmental Racism

While environmental racism is just one aspect of environmental justice, it is a pervasive issue within the environmental justice movement. Environmental racism can be defined as actions, practices, directives, or policies that affect communities, groups, or individuals disproportionately due to skin color or race (Philip & Reisch, 2015). It is often a barrier to obtaining clean water for means of living, along with interfering with other basic necessities like clean air (Robinson et al., 2018).

Not all instances of environmental racism are intentional, especially due to the existence of implicit biases and normalized systematic processes. Race and ethnicity often play an indirect role in impacting which communities people live in. De jure segregation dictating where people are allowed to live based on their race was illegalized in the United States decades ago, but de facto residential segregation continued to exist. In other words, many people still lived in neighborhoods and communities with those of the same race as their own even though they were legally allowed to live and attend schools with other races (Popescu, 2018; Cornell Law School,

n.d.). Regardless, there are strong implications for environmental justice and environmental racism even just when considering where people live, because their location also affects how they live (Philip & Reisch, 2015). Many important long-term health indicators, like mortality and chronic disease prevalence, can be predicted by zip code (Graham, 2016). Racial minorities and others who are more likely to reside in areas that are more susceptible to environmental injustices are, in some cases, on the front lines of environmental movements because they tend to be the most affected by political oppression, pollution, heat island effects, and resource scarcity (Slocum, 2018). According to a 2019 Yale survey, Hispanic/Latino and Black Americans are more likely to be alarmed or concerned about global warming than their White counterparts and tend to be more willing to advocate for policies aimed to reduce global warming (Ballew et al., 2020). However, overall, environmental activists are still overly represented by White and more affluent people (Philip & Reisch, 2015).

In fact, discussions on environmental justice were first started by people of color who worked to minimize exposure to toxic hazards in their neighborhoods. According to the U.S. Department of Energy Office of Legacy Management, the "initial environmental justice spark sprang" from a protest taking place in Warren County North Carolina during the year 1982 (n.d., para. 2). The State of North Carolina decided to build a hazardous waste landfill in a small Warren County community which was mostly comprised of black residents. The National Association of Colored People (NAACP) and others took part in an enormous protest. Over 500 protesters were arrested including Delegate Walter Fauntroy who was a member of the House of Representatives from D.C. and Dr. Benjamin F. Chavis, Jr. from the United Church of Christ (U.S. Department of Energy, n.d.). This event helped empower people of color living in low-income communities to fight against being "targeted by industry" for harmful environmental

activities which increased illnesses (U.S. Department of Energy, n.d.). Activists networked across the county to implement principles of civil rights including fairness, equity, self-determination, and also collected persuasive data that brought to light environmental racism and its repercussions. (Brennan et al., 2017; U.S. Department of Energy, n.d.).

One organization started by this ideology was West Harlem Environmental Action. At the time of its founding, it also went by "WHE ACT," though it is known today as "WE ACT." As the "leading environmental justice advocacy group in New York City," WHE ACT, partnering with the Natural Resources Defense Council (NRDC), successfully won a lawsuit against the New York City Department of Environmental Protection regarding the North River Water Pollution Control Plant (Miller, 1994, p. 720; Anderson, 1994). Like the hazardous waste landfill in North Carolina, the Control Plant was controversially built in a low-income area composed of predominantly Black residents. Community advocacy efforts brought to light environmental impact violations being committed by the Control Plant, and in 1993 the State Supreme Court "ruled against the City on all counts" (Miller, 1994, p. 720). A settlement agreement later that year resulted in stricter enforcement of previously ordered corrective actions and more effective monitoring practices. The agreement also required the City of New York to pay NRDC and WHE ACT $1.1 million dollars, which would go toward creating the North River Fund (Miller, 1994). This was one of two funds created using City dollars to support continued environmental efforts by and among local community members, which also did not include the City committing $55 million of capital funding to "correct the design and odor problems" at the Control Plant (Miller, 1994, p. 721).

Due in part to these types of advocacy efforts, it is now acknowledged that environmental racism can affect individuals, communities, and even be a pitfall for the functioning of entire communities. (Brennan et al., 2017).

Water Poverty and Scarcity

It is commonly assumed by people in the United States that, because the country is considered a developed nation, everyone within its borders has access to clean water. The "public takes for granted" that clean water will flow out of their taps when they turn the knob, viewing it as a "certainty" instead of a good that must be conserved, monitored, and properly valued (Bipartisan Policy Center, 2016, pp. 2-3). While most U.S. residents do have access to clean water, it may be surprising to some that there are still areas in which residents experience water scarcity or water poverty.

Water scarcity and water poverty go hand in hand, and one can result in the occurrence of the other (Shalamzari & Zhang, 2018). Water scarcity refers to situations in which there is not enough water to fulfill the needs of humans or natural ecosystems and can lead to water poverty. Water poverty refers specifically to when humans do not have adequate access to clean water for their personal daily needs including bathing, drinking, and proper sanitation, or when an area is unable to afford clean water through sustainable methods to all its people all the time (Abdelmawla, 2017; Shalamzari & Zhang, 2018).

There are different types of water scarcity with underlying causes. This information can be useful when investigating cases of water poverty in communities because these underlying causes can help determine which intervention strategies to implement. The main types of water scarcity are physical, political, economic, institutional, and managerial, though they can overlap (Molle & Mollinga, 2003). Water poverty can be found wherever these types of problems occur

including in urban, suburban, and rural areas. Underlying causes of urban water poverty vary depending on the specific type(s) of water poverty involved (e.g., physical, political, economic, institutional, managerial), specific regions and communities, and other social factors. For instance, areas that are home to minority groups can be more susceptible to falling victim through deliberate or institutional sociopolitical oppression (Bakker & Hemson, 2012). When different types of water scarcity occur simultaneously, the increased factors can easily result in an even more complex environment for stakeholders to navigate.

Physical (or absolute) water scarcity occurs when there is a literal lack of water due to droughts or unsustainable water usages. Climate change can play a large role in this because unpredictable weather patterns make it hard to adequately prepare infrastructures for droughts and floods (UN-Water, n.d.). There is a strong correlation between physical water scarcity and financial poverty. If an individual, community, or region is impoverished and cannot afford water infrastructures, then the human right of having safe water may be unattainable (Shalamzari & Zhang, 2018).

Political water scarcity happens when people are prevented from accessing clean water due to subordination, negligence from government officials, and public policies that negatively affect people's access to clean water (Molle & Mollinga, 2003). Hydropolitics can include varied phenomena from international wars over water access to aspects behind urban flooding (Goh, 2019; Lufkin, 2017). Lenses used to study hydropolitics include, but are not limited to, landscape ecology, environmental ethnography, and urban political ecology to examine sociopolitical and biophysical (in this case referring to disciplines such as geography, geology, and meteorology) factors specific to the situation at hand (Goh, 2019).

Institutional water scarcity is often more subtle than political water scarcity and happens when the larger society is unable to predict or meet supply and demand trends and to institute necessary technological mechanisms to help preserve the environment (Molle & Mollinga, 2003). Economic water scarcity occurs when there is an incapacity to dedicate financial or human resources to ensure that clean water is available despite other physical, political, or institutional hurdles. This incapacity can be on the part of residents through not being able to afford water bills, or organizations and individuals who lack the necessary time, labor, or resources needed to collect, purify, and distribute water (Molle & Mollinga, 2003).

Economic causes of water poverty can tie in closely with managerial causes, which occur when water systems and infrastructures are improperly managed or maintained. This can prevent those who would normally receive water from being served (Molle & Mollinga, 2003). Examples include mining of aquifers, not considering reservoir carry-over stocks, and leaks in the distribution networks (Molle & Mollinga, 2003). Often, problems can be attributed to how water systems were first installed, because they may not have been built correctly or in accordance with safety standards. However, the age of water supply infrastructures can easily account for maintenance and water quality problems, as seen with Flint, Michigan (Ruckart et al., 2019). Even if water systems are built perfectly, they will still age and require costly upgrades (Bipartisan Policy Center, 2016) A somewhat common problem is that areas may start out having quality water infrastructures (even well before houses are built), but the water systems age while local population demographics shift to consisting of higher numbers of minority racial and ethnic groups.

In the United States, there is aid available states to help upgrade water systems. This aid can take the form of subsidies from the federal government to the Drinking Water State

Revolving Fund (DWSRF), which is the largest resources of intergovernmental assistance in the country (Hansen et al., 2021). However, when states allocate the funds to its water providers, certain communities are at high risks of not receiving these funds even though they will greatly benefit from the money. The communities most at risk of are those that are unincorporated, small, and have large numbers of residents who are of color or low-income (Hansen et al., 2021). Data shows that populations with higher proportions of white residents are more likely to receive DWSRF awards, meaning that minority populations are likely to be disproportionately affected by poor water quality (Hansen et al., 2021).

Overall, the major obstacles related to water scarcity and water poverty are absolute scarcity, lack of access to sanitation and enough drinking water, decreases in water quality, having fewer financial resources available to provide clean-water infrastructures, political fragmentation regarding management of water resources, and decision-makers not knowing how pervasive such issues are (Shalamzari & Zhang, 2018). The types of water scarcity most likely to occur in the United States are probably physical, political, and managerial. For example, it is not uncommon for droughts to occur requiring restrictions on certain types of water usage like watering lawns. Political and managerial causes are also more likely because some water policies and regulations allow loopholes or are not adequately enforced, or infrastructures may not be properly built and maintained, which may be disproportionately detrimental to disenfranchised communities.

Water Poverty Index

It can be difficult to quantifiably measure people's access to clean water, and several perspectives and measurement tools have been proposed over the years to examine the topic, including the Watershed Sustainability Index, the Index of Local Relative Water Use and Reuse,

the Human Development Index, and the Social Water Stress Index (Shalamzari & Zhang, 2018). Several of these tools examine adaptive capacity, which describes a system's ability to adjust in its changing climate and is key to achieving sustainability (Preston & Stafford-Smith, 2009; Shalamzari & Zhang, 2018). This capacity can be measured through availability of resources such as technology, human abilities, monetary funds, and government and institutional networks. Capacity levels also account for barriers to resources, especially those of sociopolitical nature (Preston & Stafford-Smith, 2009). A more quantifiable description of water poverty was also defined that accounted for the family household level, measuring "the ratio of the amount of available renewable water to the amount required to cover food production and the household uses of one person in one year under the prevailing climate condition" (Shalamzari & Zhang, 2018, p. 3).

Looking at a household's access and water usages requires holistic considerations including water quality and variability, a household's ability to manage water, the ways households use water, and spatial scale and environmental components. These can be divided into five categories: resources (physical existence of water), access (how accessible water is for human uses), capacity (how well people are able to manage water), use (all the different ways water can be used), and environment (how suited the surrounding environment is to sustaining water resources) (Abdelmawla, 2017). The Water Poverty Index (WPI) is one of the most recent and comprehensive tools to measure these categories (Shalamzari & Zhang, 2018).

The WPI defines water poverty "as an aggregated index of the percentage of water used in a region combined with the percentage of the population with access to safe water and sanitation, and the percentage of the population with easy access to water for domestic use" (Shalamzari & Zhang, 2018, p. 3). The WPI can be used in water scarcity assessments of

different scales but is most often utilized at the local community level. If a community's WPI is low, meaning that there are few occurrences of water poverty, then it may be an indicator that life expectancy from birth is higher and income poverty is lower (Abdelmawla, 2017). Data collected from studies using the WPI can be used to assist governing bodies with policymaking, allocating resources, prioritizing needs and processes, and other aspects of water management (Shalamzari & Zhang, 2018).

Quantifiable measures like the WPI do have weaknesses. Calculations are only meaningful if background data is accounted for when analyzing the results, and there remains questions on what variables should be considered for each element, such as factors pertaining to water quality. However, they do provide means for monitoring changes over time, comparing water accessibility between different regions, identifying communities that may need additional support, and enhancing conversations among stakeholders regarding water accessibility (Heidecke, 2006).

Sustainability

Environmental sustainability refers to the long-term human impacts on natural environmental ecosystems and abilities to maintain natural resources so that human life can continue to flourish (Peeters, 2017). Human practices of using natural resources, such as water, should be carried out in ways that the environment could replenish the resources taken in a timely manner. For instance, if people in a city use a mass amount of water from natural sources (such as lakes, rivers, and aquifers), and do not have infrastructures and procedures to ensure that unused water or rain collects in desired locations (such as a river instead of an ocean), then more water may be used than could be replenished (Fry & Reyes-Velarde, 2019). This could create an issue of water scarcity because there may not be enough safe water for future use. Not only

would city residents be affected, but also the organisms living in and nearby the lakes, potentially causing further domino effects in surrounding environments.

Another factor that relates to climate change sustainability is vulnerability. Vulnerability refers to the degree that individuals and larger systems may be harmed from exposure to hazards and can be of biophysical or social in nature (Preston & Stafford-Smith, 2009). Vulnerability can be affected by economic, political, and social elements from local to international levels. An effective framework for analyzing vulnerability levels involves looking at exposure, sensitivity, and adaptive capacity of an area or population (Thomas et al., 2019). As adaptive capacity (how well communities can change to accommodate changes in their environment) increases then sensitivity (disenfranchised and marginalized populations are more sensitive compared to those who have more social and economic capital) and exposure (physical proximity to environmental problems) decrease resulting in reduced vulnerability. Interventions aimed to increase adaptive capacity should be based on the themes of diverse knowledge sharing, culture, governance, and access to resources (Thomas et al., 2019).

Existing unevenness can make it less likely for disenfranchised groups to have access to the resources necessary to overcome environmental problems, such as recovering from natural disasters (Thomas et al., 2019). Governance involves how well civil society, governmental bodies, and private firms prepare for climate-change related risks. If populations that are more sensitive to climate risks are fairly represented in governance decisions, then their level of power will increase, they will have more decision-making ability, and their vulnerability level will decrease (Thomas et al., 2019). Culture is often location-based and affects how people perceive their surrounding environment, including attitudes toward climate change and mitigation practices, and impacts which people are exposed and sensitive to environmental hazards. Thus,

adaptive capacity levels are specific to certain cultural and contexts (Thomas et al., 2019). Sharing diverse knowledge and information about local environments can lead to better intervention strategies. Besides weather forecasts and social media transmissions related to climate change, important ecological information can be garnered from traditional, indigenous, and local populations (Thomas et al., 2019). Further historical knowledge can be found through archeology records. Social memory can also help as people may recall stories about local weather patterns or natural disasters and know how to adjust or react in similar situations to keep safe (Thomas et al., 2019).

To illustrate vulnerability in the context of water poverty, the elderly and young children are more likely to be harmed by water pollution than healthy, younger adults, increasing their level of biophysical vulnerability. According to the UN Convention of the Rights of the Child, children are affected by climate change damages more than adults, and it is one of the leading threats to young people's health (Rabb, 2017). Governments have a duty to ensure that children's rights are not violated due to climate change. Because children are such key stakeholders, their voices should be actively listened to in discussions relating to the environment. On a more systematic social level, people of color and those experiencing poverty are more likely to experience water poverty in general (Gross, 2012).

Sustainability and increased water availability can be reached through enhancing adaptive capacity. This can be done by reducing water footprints, increasing the efficiency of water usages, and obtaining clean water in more innovative, unconventional ways (Shalamzari & Zhang, 2018). Water footprints can be defined as the amount of fresh water utilized in the production or supply of the goods and services used by a particular person or group (Van Oel & Hoekstra, 2010). The goal should be to have as low of a water footprint as possible because that

means more water is being conserved or used more sustainably. Water footprints fall into three categories: green, blue, and grey. Green water refers to the amount of rainwater water stored within vegetation or soil, blue water refers to groundwater and surface water that has evaporated, and gray water is the amount of surface and groundwater that has been polluted (Van Oel & Hoekstra, 2010). Most urban water concerns will most likely be affected by blue and gray water footprints.

Efficiency can be increased by helping ensure that water is conserved by groups and individuals and that infrastructures like pipes and water treatment centers do not leak and route as much clean water as possible back into the environment (U.S. Environmental Protection Agency, n.d.). Unconventional water sources can include seawater desalination using renewable energy (which would be more applicable for coastal areas), harvesting rainwater for urban and domestic use, and (somewhat more commonly) treating and utilizing municipal sewage, which would otherwise be released directly into the environment and cause pollution (Shalamzari & Zhang, 2018; U.S. Environmental Protection Agency, n.d.).

One such example of improving water use efficiency and blue water footprints is California's utilization of *shade balls*. In 2008, California started depositing small, heavy balls into some of its reservoirs which completely covered the water's surface. Their purpose was to block sunlight which, when it interacts with treated water, causes carcinogenic bromate to form. When the City of Los Angeles was experiencing a dangerous, record-setting drought in 2015, 96 million shade balls made of polyethylene were deposited into the Los Angeles Reservoir. This not only improved water quality but also conserved water by slowing evaporation by 85 to 90 percent. One of the drawbacks was that it takes more water to produce the balls than the balls initially preserve. Depending on the type of balls and manufacturing process used, it can take

well over a year's worth of use for the balls to save more water than was consumed during their production processes (Grennell, 2018).

Sustainability has become a political term not only because of debates on climate change, but because sustainable practices are often directly economic, political, and social in nature (Peeters, 2017). Sustainable development involves three main aspects: economic growth, environmental protection, and social equity (Ibobor, 2017).

One of the reasons why sustainability falls under the economic umbrella is that desires to increase profit margins, build infrastructures, harvest natural goods for products, and appeal to ecological values all can influence how companies expend natural resources (Camilleri, 2017). For example, some companies over-harvest forests or fish with seemingly little regard to negative environmental impacts while others center their business model around promoting environmental sustainability (Setthasakko, 2009). In fact, businesses are now being encouraged to take on what is known as corporate social responsibility which often includes implementing environmentally sustainable practices (Camilleri, 2017). Another reason is that economic development and urban planning practices involves sustainability aspects including land development, incentives to land developers for tree preservation and providing park space, types of materials used in construction, and even new developments providing adequate drainage for flood mitigation and water runoff (which incidentally can have a negative correlation with preserving trees, which cannot be helped) (Elmendorf et al., 2005; Town of Flower Mound, n.d.). Many of these economic and planning practices are created and enforced by laws and policies, which brings sustainability straight into the political and social realms (Butner, n.d.).

Political and Legal Perspectives

Politics can be defined by who gets what, when, and how. Therefore, the question may become along the lines of the following:

1. *Who gets clean water?* Would it be companies like Nestle, public facilities, households, wealthy neighborhoods, or individuals experiencing homelessness?
2. *When will they get clean water?* Will it be immediately when someone moves into a house? When a person without a home drinks from a sink in a retail shop during operating hours? After a water utility bill is paid?
3. *How will they get clean water?* Will the water come from a lake and then be processed in a water treatment center? Will the water come from a privately owned well? Does an individual have to manually collect water from outside their home, boil contaminated tap water, or does clean water just flow from their sink at the turn of a knob?

Legal policies and enforcement can affect the answers to many of these questions, which clearly relate to social equity and environmental justice. Should a person experiencing homelessness die from dehydration on a hot day? Should an impoverished household have clean water flow into their sinks when they cannot afford utility bills or plumbing repairs? Should a municipal water rate be the same for each customer across the board, or should seniors get a discount? Should water usage be restricted during droughts? Such questions may seem endless.

Intergovernmental Relations

The United States has a federal form of government with several layers and branches of governing bodies. This greatly complicates matters when it comes to determining which levels and positions are responsible for creating and enforcing different regulations. Governmental

levels and bodies often argue with each other about who gets power over certain issues. Citizens and government officials alike can easily get confused and argue about which parties oversee which issues at which locations (Shafritz et al., 2017).

In Texas, theoretically, local municipalities answer to federal and state regulations, and states must also abide by federal laws. Counties serve as the administrative arm of state government and work in parallel with cities to provide services (B. Hart, personal communication, November 15, 2021). Counties also have relatively more control over unincorporated land areas than municipalities. However, things can quickly become complicated because regulations, services, and programs often do not have clear cut boundaries. This is sometimes remedied by the existence of special districts like water utility districts and independent school districts. Even still, in the local government sector, officials must regularly interact with representatives from neighboring cities and districts to negotiate, draft agreements, and collaborate on special projects.

Local governments must also navigate fine lines between what they are allowed to do and what they are forbidden from doing by the state. In Texas, there is a pervasive issue of the State limiting the rights of cities in making their own decisions. The Texas Municipal League, a coalition of Texas cities, conducts lobbying efforts and publishes legislative reports in efforts to allow cities to retain their autonomy (Texas Municipal League, n.d.). Examples of this issue include the State forbidding cities from enforcing an ordinance mandating that store customers be charged for plastic grocery bags, the State overturning a fracking ban that residents voted for in the City of Denton (which made international news), and the State suing the City of Denton for passing an ordinance requiring people to wear masks during the Covid-19 pandemic (Paxton, 2022; Maqbool, 2015; Texas Municipal League, 2016).

Land Use and Urban Sprawl

Environmental justice can be promoted at local levels by evaluating land use policies and repercussions of potentially harmful land uses on low-income, racial and ethnic minority, or rural communities (Phillip & Reisch, 2015). Land policy involves decisions that impact the way land is not only used but valued and distributed to execute political decisions relating to the goals of spatial development (Debrunner & Hartmann, 2020). Land use policies and regulations can specifically decide which zoning districts tracts of land are assigned to and what can or cannot be done with specific parcels. Examples of zoning categories include single family residential, multifamily residential, commercial, office, light industrial, and heavy industrial (more zoning types are listed in Appendix B). Zoning and land use maps (pertaining to the City of Denton) are also included in Appendix B.

It is common knowledge in planning related fields that properly executed planning and zoning processes go far in preventing undesirable outcomes like unorganized development patterns, un- or under-utilized spaces, and physically harmful effects from certain development types (M. Inclan, personal communication, April 28, 2022). An example of the latter would be allowing a large, heavy industrial factory to be built next to a residential neighborhood. One of the many reasons why this is not a good idea is increased risk of environmental pollution which could contaminate nearby air, land, and water. Those living next to the factory would be at increased risk of suffering from health issues related to air quality and unsafe drinking water.

Having a factory and homes side by side can also be a matter of income segregation and environmental racism. Houses that are located away from factories and closer to convenient job and retail hubs are more likely to be expensive. Racial minority groups in general face more economic disparities than their white counterparts. Because they generally have lower incomes

and face lasting effects of housing segregation, people of color are more likely to live in lesser desired areas of cities where factories and other pollution-causing facilities affect their water sources, health, and overall quality of life. There are also effects from overt forms of racism from past centuries such as exclusionary zoning, racial segregation, and redlining that contribute to current cases of covert environmental racism in urban areas (Woo et al., 2019).

Exclusionary zoning first became an issue in the 1880s, and there are arguments claiming that it is more prominent today than ever before (Whittemore, 2021). Exclusionary zoning occurs when local land use practices essentially obstruct people with low and moderate incomes from gaining suitable housing (Whittemore, 2021). Before the mid-1900s, social segregation was often an explicit goal of land use zoning. A common theme is that this often provided a legal loophole for the elite to push for greater separation from other ethnic, racial, and income groups so that the elite communities could uphold their economic and social values. The first occurrence of zoning in the United States was in the 1880s when California cities limited laundries to certain districts. Much of the industry was owned by Chinese Americans, and this effort was seen as an attempt to "contain" the population (Whittemore, 2021, p. 168). A similar example was a novel zoning ordinance in New York City which separated Fifth Avenue from garment factories and their immigrant workers (Whittemore, 2021).

As decades passed, zoning helped enable racist real estate practices such as redlining. Redlining began in the 1930s when the Federal Housing Authority (FHA) and other lenders made efforts to provide quality housing to white, middle class families to the detriment of racial and ethnic minorities. This was done by mapping neighborhoods that were undesirable, and made of predominately black residents, and creating prohibitive eligibility guidelines for mortgages and loans making it extremely difficult for people within these mapped areas to buy

houses or have loans approved to help maintain them. At the same time, the FHA subsidized mass housing constructions in suburban areas with the stipulation that homes could not be sold to black people (Gross, 2017; McClure et al., 2019; Whittemore, 2021). Further policies contributed to gentrification and urban blight. Urban renewal programs, which remodeled blighted properties through eminent domain, led to the displacement of almost one million people—the majority of whom were from racial or ethnic minority groups (McClure et al., 2019).

Such structural racism and discriminatory policies have environmental justice implications relating to long-term impacts on poverty rates, health, and living environments (Jorgenson et al., 2020). Evidence suggests that inner-urban neighborhoods that were affected by urban blight and segregation currently experience hotter weather temperatures than nearby suburbs (Anderson, 2020; Plumer et al., 2020). These temperature patterns are part of what is known as heat islands. *Heat islands* are urban areas that experience higher temperatures than the areas surrounding them. This is due to large amounts of concrete, roads, buildings, and other infrastructures that "absorb and re-emit the sun's heat" (U.S. Environmental Protection Agency, 2022). In contrast, areas with more greenery and water bodies, such as more suburban areas are affected less by heat re-eminence than inner-urban areas. During the day, urban areas can expect temperatures that are approximately 1–7°F higher than "outlying areas" and 2-5°F higher during the night (U.S. Environmental Protection Agency, 2022). Heat islands can result in heat equity, meaning that older adults, pregnant persons, young children and infants, those experiencing homelessness, and people with less income and mobility are at higher risk of heat-related health problems (U.S. Environmental Protection Agency, 2020).

Land use policies also affect city borders and can contribute to urban sprawl. Urban sprawl is attributed to negative impacts such as water and air pollution, social homogeneity, and inequality (Brody, 2013; Ewing, 1997; Squires, 2002). Urban sprawl is defined as hasty, uncontrolled expansion of metropolitan regions involving complex patterns of transportation, land use, and economic and social development. Urban sprawl can also be described as transition zones without definite borders between rural and urban areas. The ideal pattern for expansion to happen is by creating mixed-use, dense neighborhoods that contain multiple commercial, residential, and institutional uses within close proximity to each other to create complete communities where people can live, work, and play without having to move around throughout their life. This urban pattern leads to greater outcomes in terms of reduced traffic through increased walkability and lower impact on the environment by maximizing the use of smaller parcels of land (M. Inclan, personal communication, May 12, 2022).

However, that is rarely the reality when urban sprawl occurs. Due to past patterns of income growth, job accessibility, upward mobility, White Flight (a phenomenon where wealthier white persons migrating en masse from predominately minority inner-city areas to suburbs), quality of public education, racial segregation, family structure, and housing affordability, many people who had the chance moved away from urban hubs closer to city borders (Crowder & South, 2008). Those remaining, who were more likely to be lower-income racial minorities, suffered from urban blight and its effects such as pollution and lack of job opportunities (Frumkin, 2002).

The increased population in these outer regions created convenient opportunities for business and job opportunities. Instead of commuting downtown, residents of these outer regions gained more opportunities to have restaurants, retail stores, and offices built closer to their

homes. This resulted in city expansion and satellite-like city developments creating leapfrog effects in between the different regions of the same city (Frumkin, 2002). The boundaries between urban, suburban, and rural areas became much less clear and helped give cities more opportunities to annex unincorporated, neighboring pockets of land as their populations expanded outward (Watkins & Fleischmann, 1980).

Annexation. While many of the following concepts regarding annexation are generalizable, this literature review emphasizes annexation policies and practices in Texas because that is the location of Green Tree Estates, the neighborhood featured in this case study. Annexation practices are extremely complex, and an in-depth analysis is outside the scope of this study so instead only a summary is provided. Annexation is a type of land use process in which land adjacent to a municipal boundary officially becomes part of the municipality. At least in Texas, this can be done by home-rule municipalities exchanging areas with each other, "fixing" the boundaries of a municipality, or by extending the borders of a municipality and annexing adjacent areas (Texas Local Government Code § 43.003, 2021).

One of the reasons why cities wish to annex land is to better plan for future developments and infrastructures (Houston, 2019). If developers build on incorporated land away from the city (i.e., "leapfrog development") then the processes to "extend public facilities" will be more expensive and inefficient (Town of Oro Valley, 2020, p. 5). A second primary reason is to allow residents, both current and the prospective annexation area, to benefit from economic growth (Houston, 2019). Other reasons may include perceived desires of local property owners, making service areas and boundaries more "logical," ability to "control urban growth," create space for more jobs, allow for transportation thoroughfare projects, and fulfilling strategic plans (Town of Oro Valley, 2020, p. 5). There is also a possibility that cities may annex

land to increase revenues, mainly through sales tax and property taxes, from future developments.

To help plan for population growth and future developments, Texas law allows municipalities to reserve between half a mile to five miles of land (based on population size) outside of their boundaries (City of Pflugerville, n.d.). These buffer areas are called extraterritorial jurisdictions (ETJ). Texas cities cannot annex land within another municipality's ETJ, allowing cities to have full planning control over their designated areas. This theoretically encourages cities to create plans and build utility extensions in their ETJ (City of Cibolo, n.d.).

Cities are only allowed to implement a limited number of regulations within their ETJ including infrastructure standards, subdivision regulations, tree preservation requirements, health and safety regulations, and fireworks bans (City of Cibolo, n.d.; City of Pflugerville, n.d.). Cities are forbidden from enforcing land use regulations, zoning, or density criteria within their ETJ until the area has formally been annexed (Mixon et al., 2021). These regulations are intended to make sure that future projects meet development standards easing annexations processes. Most municipalities in Texas are allowed to create development agreements with landowners within ETJs to 1) make areas immune from being annexed for a maximum of forty-five years, 2) allow the landowner to create a development plan that would be approved by the city, 3) allow agreed-upon land-use enforcement, and 4) provide for infrastructures including streets and drainage (Mixon et al., 2021). Visual examples of municipal growth through annexations and ETJ areas are included in Appendices A and B.

Service Distribution in Unincorporated Areas. Those living in unincorporated areas do not pay city taxes but may benefit from certain city utilities or facilities. Regardless, these residents may still pay counties or contractors to provide other necessary services like emergency

response assistance. If an unincorporated land area becomes annexed, the residents must then pay their share of city taxes to help maintain any city facilities or services they are already enjoy (City of Cibolo, n.d.).

Returning to the discussion on intergovernmental relations, there can be difficulties between different levels of government when it comes to unincorporated areas and annexation. The State of Texas has the power to regulate annexation and other land-use policies, which often angers cities because their rights become limited (Houston, 2019). At local levels, cities and counties both have responsibilities towards unincorporated areas, which may cause gaps in services and confusion as to which entity is responsible for needed services.

The responsibilities that cities may have for nearby unincorporated areas, mainly within their ETJ, have already been discussed (e.g., health and safety concerns and other policy matters relating to future development). Most other regulations fall under county control and may be determined by county commissioner courts. Examples of these include developments within floodplains, septic tank installations, property subdivisions, construction and inspection of buildings, location of communication facilities like radio towers, and certain businesses such as recycling centers and retail shops that display goods outside (Dallas County, Texas, n.d.). This setup can make it easy for government entities to *pass the buck* so to speak, and lay responsibilities and problems on each other. This blame results in service delays and for problems to go unaddressed.

Currently, cities in Texas are required to provide full services to newly incorporated areas within two and a half years after annexation becomes official (though if a city is unable to reasonably provide certain services that may be extended up to four and a half years). There are some services that must be provided to newly annexed areas the day annexation becomes official

(that is if cities already provide the services within their boundaries). These include, but are not limited to, police and fire protection, emergency medical services, water and wastewater facilities, street maintenance, and solid waste collection (with several exceptions) (Texas Local Government Code § 43.056, 2021).

There are drawbacks associated with annexation. One of which is that annexation can also cause leapfrog effects if the new area is not contiguous to current city borders or is connected only by a small strip of land (i.e., shoestring effect). This causes city boundaries to become fragmented, patchy, and chaotic (DeMaria, 2015). Some land regions may end up with more city services than other regions that are still unincorporated or more freshly annexed. This leapfrog effect is heightened when cities annex areas they are unable to realistically care for or when costs to expand services increase (DeMaria, 2015; Economic & Planning Systems, Inc., 2020). As seen with this case study, annexation may also result in one neighborhood pocket within city limits having full services with an adjacent neighborhood, also within city limits, having limited services.

Changes in Texas Annexation Laws. Texas state regulations for municipal annexation procedures have changed drastically over the past several years. In 2017, Senate Bill 6 required that landowners or voters approve annexations before they occur in counties with a population of 500,000 or greater and counties that chose to opt-in through democratic processes (Houston, 2019). In 2019 alone, four annexation bills passed the Texas Legislature. One of these being H.B. 347, which ended most unilateral annexations and modified the requirements of S.B. 6, giving further specifications for how annexation can be approved (Mixon et al., 2021). The second bill, H.B. 4257, stated that if voters decided against annexation, any obligations that city had with providing services to the area would not change. It also stated that cities could not

increase water costs to areas just because annexation was not approved. The third bill, S.B. 1024, required that for annexations not requiring consent of residents, cities at or below 350,000 in population should provide service plans to annexed areas that are closely comparable, if not identical, to the rest of the city. S.B. 1024 also outlined the legal process annexed residents could take if their service costs disproportionately exceeded those of municipal residents. The fourth bill, S.B. 1303, instructed cities on how records of city boundaries, including maps, should be retained and made accessible to the public (Houston, 2019; Mixon et al., 2021).

As previously discussed, according to the Texas Local Government Code § 43.056 (2021), full-service plans must be created before annexation takes place, which detail how cities will provide emergency services, solid waste collection, road maintenance, and other facilities and services currently provided to existing residents. However, this law was modified by S.B. 6 and carries many exceptions detailed in Texas Local Government Code § 43.056(f) (2021). One such exception is that service plans cannot require landowners in the annexation area to pay for capital improvements needed to provide city services in ways that go against Chapter 395 of Texas Local Government Code (which discusses municipal management districts), unless through mutual agreement with the landowner.

Water Quality Regulations

In Texas, water wells that are privately owned are largely unregulated and do not serve public water supply systems (The State of Texas, 2021). The EPA defines a public water system as having "at least 15 service connections" or serving "an average of at least 25 people, for at least 60 days per year" (Water Systems Council, 2020, p.1). Almost a dozen states have chosen to implement stricter regulations. South Carolina and Washington are the strictest because they consider systems serving more than one single dwelling as public systems (though Washington

has allowances for small owner-operated systems that existed on September 20, 1977) (Water Systems Council, 2020). Texas does not have any state laws that govern private ownership of water wells, though does not prohibit counties from creating their own policies. However, no county in the state of Texas has thus far chosen to pass such legal regulations. Municipal regulations largely only dictate who is allowed to drill and where. Additionally, there are not any state or federal requirements for monitoring the quality of drinking water provided by domestic water wells. There are also no "right to know" reports notifying well owners of their drinking water quality, and no treatment requirements (The State of Texas, 2021, Private Water Wells, para. 2).

In the City of Denton (where Green Tree Estates, the primary focus of this case study, is located), those wishing to develop individual water wells or private water systems must undergo official application and approval processes through the Water Utilities department. The steps involved in these processes include, but are not limited to, obtaining cost estimates, undergoing water quality tests, maintaining safety standards, and verifying the number of people who will be served by the well (City of Denton Development Code § 7.6.16). The City of Denton is allowed to accept private water systems for maintenance and operation as long as the system is connected to city water lines and that the system had been constructed and maintained according to city and industry standards (City of Denton Development Code § 7.6.16.2 h.).

At the national level, the U.S. Environmental Protection Agency ([EPA], 2021) does not regulate individual, privately owned water wells. However, the EPA does provide information to water well owners regarding water well quality and maintenance. The EPA encourages well owners to conduct annual water quality tests and run additional tests immediately if there are changes in water color, odor, and taste. The EPA also advises immediate water quality testing if

repairs are made to the well, problems with drinking water or ground water in the area are already known, or if there are recent changes to the surrounding environment (e.g., new industrial activity or construction, flooding, or other land disturbances). There is also specific information on which pollutants to test for depending on certain water characteristics or events. For instance, if there is nearby gas drilling then private water wells should be tested for strontium, sodium, chloride, and barium, or if there are cases of recurring gastro-intestinal illnesses, then tests should be run for coliform bacteria. If the tests return positive for contamination that violates health standards, well owners should contact their local health department for direction on how to proceed (U.S. Environmental Protection Agency, 2021).

According to Texas Code §92.0563 regarding tenant and landlord relations, Texas does authorize justices of the peace to order landlords to address conditions that impact a tenant's safety or physical health, but only if the cost of the repair is not more than $10,000. Tenants may obtain a repair order in a justice court without an attorney, which makes the process more readily accessible for those who cannot afford attorney fees (Office of the Attorney General of Texas, n.d.b). Tenants who go through the process will be met with three potential outcomes. They will either have the ability to end the lease, have the issue repaired and have the associated cost deducted from their rent, or have the ability to file a lawsuit against their landlord to make needed repairs.

Tenants living in Texas who need property repairs should complete the steps below, which are detailed in Texas State legal codes §92.056 and §92.0561:

1. If rent is current, send a dated letter to the landlord outlining the repairs needed, verifying receipt of letter as best as possible, and keeping a personal copy of the letter;

2. The landlord should make the repair(s) in a reasonable time, which is usually seven days. If that does not happen, tenants should send a second letter via certified mail and request a receipt;
3. If repairs still have not been made, then tenants should consult an attorney. (Office of the Attorney General of Texas, n.d.b).

It is important to note that these regulations may only apply to problems directly on the rental property and may not cover wells owned by a third party. Also, if a person owns their own home, these legal protections may not apply at all in cases of utility conditions. Other weaknesses of these legal codes are that necessary repairs to ensure tenant safety could exceed $10,000 in costs, and that tenants may have no desire to completely end their lease and move (Office of the Attorney General of Texas, n.d.b).

Case Examples

One of the most famous examples of water poverty is Flint, Michigan where the aging water facilities were tainted with lead and copper due to unregulated emissions by municipalities and industries. The water source was changed without adjusting treatment procedures, and the new source did not provide enough water for the large rise in population growth (Masten et al., 2016). The Flint water crisis resulted in long-term health effects on children, community-wide trauma, and loss of trust residents had in their government (Hanna-Attisha et al., 2016).

Another example of water poverty took place in rural Guatemala where there were concerns about unclean water. An international service learning program group consisting of a collaborative effort between social work and engineering students completed a case study of the area. The students tested water quality in homes and schools and installed water filters. This generally sounds like a good thing to do, but the execution was not culturally competent. There

were strong power imbalances between the social workers and the residents, and the purpose of the intervention was not effectively communicated to the residents. When the water testing was conducted, families did not understand why people were coming into their personal living spaces and using strange equipment. There was a strong level of mistrust among the community because residents were not given much reason to trust the authority figures trying to help (Matthew et al., 2016).

One of the most wide-spread occurrences of water poverty can be found in Colonias. Colonias are most likely to be found near the border of Texas and Mexico but can also occur elsewhere. These are substandard residential developments where occupants lack basic services like paved roads, drinking water, and sewage treatment. Residents are likely to be Hispanic, Spanish-speaking, and living in economic poverty. The State of Texas created a series of laws that aim to prevent the existence of Colonias and ensure that people have access to basic infrastructures. Such laws mandate subdividers to provide sewer, roads, water, and other basic infrastructure when platting new residential developments. The laws also restrict the selling of un-platted parcels and lots that do not have water and sewer access, and limit utility connections in substandard areas. However, some of the primary laws only apply within boarder areas or in "'economically distressed' counties with high unemployment and low per capita income." (Office of the Attorney General of Texas, n.d.a).

On a smaller scale, a case of water poverty that is currently ongoing is within Sandbranch (sometimes spelled as Sand Branch) in Dallas, Texas. Like Green Tree Estates, Sandbranch is an unincorporated community that has never had its own sewer system, running water, or trash pick-up. It also does not have streetlights, fire services, or local government. Sandbranch consists of approximately one-hundred residents and is located about twenty miles southeast of

downtown Dallas. The community is a former freedman's town and dates back to the 1800s, and 87% of its residents are black. Sandbranch has relied on well water, which was contaminated by E. coli in the 1980s resulting in many people getting sick (Rivas & Keomoungkhoun, 2021).

Nearby cities explored the possibility of annexing the area, but advocates believe they were deterred by the high costs associated with annexation processes. In 2003, the Federal Emergency Management Agency (FEMA) stated that Sandbranch violated floodplain regulations which stalled hopes of development. Dallas County demolished the homes that did not meet regulations and the Texas Water Development Board provided funds to help the residents relocate. The only homes that were not destroyed were the ones built before County floodplain regulations were enacted. Meanwhile, residents either collected water directly from deep wells and pumps as able, or relied on bottled water for drinking, cooking, and bathing. Residents could pick up donated water at Mt. Zion Baptist Church, which was the only community center left in the area (Rivas & Keomoungkhoun, 2021).

In 2016, a volunteer run corporation called Sandbranch Development and Water Supply Corp. was created and received pro-bono assistance from an environmental attorney. In 2020, the Texas Water Development Board stated it would grant the corporation $450,000 to design, plan, and build metered water line infrastructures. The corporation also plans to purchase wholesale drinking water and water treatment services from Dallas Water Utilities. The corporation qualified for the grant because Sandbranch's "lack of water and wastewater management were public health concerns" (Rivas & Keomoungkhoun, 2021, p. 1B). Another helpful change is that FEMA has since updated the flood plains. Most of Sandbranch is now at or above floodplains, allowing opportunities for future development (Rivas & Keomoungkhoun, 2021). A primary reason why Sandbranch did not have clean water for so long was because there was a lack of

professional leadership (mainly legal and engineering) to handle the bureaucratic processes. The community often relied on outside advocates and champions like Paster Eugene Keahey of Mt. Zion Baptist Church. Pastor Keahey brought Sandbranch to the attention of federal official, even giving them a tour of the community. He also organized trash pickup services, food drives, and helped build a team of attorneys and engineers to address the problem of water poverty. Unfortunately, Pastor Keahey and his family were victims of homicide in 2019 causing advocacy efforts to slow (Rivas & Keomoungkhoun, 2021).

Reactions from the outside community varied. A woman was "shocked" when she discovered that there was a town without any running water just a short drive from her home" (Rivas & Keomoungkhoun, 2021, p.1B). A County Commissioner, along with many others, believed that the only solution was to give residents enough money to relocate. They did not think it would be possible to provide water to the community and did not want to invest millions of dollars for only one-hundred people. Others were of the notion that if residents could legally live in the area then they should be able to choose to live there (Rivas & Keomoungkhoun, 2021).

Green Tree Estates

The previous case examples describing Flint, a location Guatemala, Colonias, and Sandbranch show how contaminated drinking water can be a problem in different countries, regions, urban and rural areas, and can affect disenfranchised racial groups and neighborhoods. These cases help illustrate that instances of water poverty are not limited to affecting specific geographical regions or people groups, but situations may more commonly affect (or at least cause others to overlook) communities whose residents are primarily of color or low socio-economic status. As with Sandbranch, people can live close to such neighborhoods and never

realize that, just a few streets away, families are living without clean water. These case studies also help show that situations where people lack clean water are not as rare as what many may presume.

These specific examples were chosen, in part, because of their similarities to Green Tree Estates in Denton, Texas (the neighborhood which this study is about) might be considered an example of a Colonia outside the border area. Most of its residents are Hispanic and only speak Spanish, and many come from an immigrant background. Like Sandbranch, the residents paid city taxes, but did not have paved roads, trash pick-up, or water provided by city utility services (Rivas & Keomoungkhoun, 2021; Woodard, 2019). The Green Tree Estates case is also comparable to the village in Guatemala because, as will be discussed in more detail, there were significant cultural differences between residents in need of clean water and those providing assistance, resulting in havoc.

Getting into the specifics of Green Tree Estates, the Spanish-speaking Hispanic mobile home community of about 50 people was annexed by the City of Denton in 2013. The homes were served with undrinkable water from a water well system privately owned by Don Roddy, who also owned large portions of the land within Green Tree Estates (Perez, 2019; Woodard, 2019). An image of the contaminated tap water is included in Appendix C.

It is important to note that the initial annexation procedures for Green Tree Estates were adopted in 2011 and did include options for increasing water services, but the well-owner had declined to connect to the water services. The city was also unable to connect to the customers directly because the unpaved roads were privately owned as well (Perez, 2019). The lack of clean water was not a new issue for the neighborhood. In fact, Mr. Roddy was ordered in 2002 to bring the water system into compliance, but he was fined in 2014 for the same problems

including operating the system without a license and failing to run water quality tests (Perez, 2019). In 2019, the State of Texas listed the water system as inactive, resulting in the City of Denton filing a complaint to the State saying that it was still active, and should be categorized as a public water supply because it served more than twenty-five people (Perez, 2019).

Although the water was not fit to drink, the residents still used it for other activities like showering and cooking, but there were also reports of the water causing children's skin to blister (Hicks, 2020). Residents were unaware that Mr. Roddy had been given the option to connect to city water in the annexation agreement, and continued to live in survival mode (Hicks, 2020). When the owner shut down the well for personal financial reasons, he did not give adequate notice for residents to make alternate arrangements. The City reached out to the Public Utility Commission (PUC) requesting that Mr. Roddy be required to maintain the well for 120-days (as is the required length of notice when public water systems decide to shut down). After investigating, the Texas Commission in Environmental Quality (TCEQ) determined that there were nine connections serving 22 people, which was not enough to categorize it as a public system. The Public Utilities Commission (PUC) also investigated with similar results (Heinkel-Wolfe, 2019b). As such, the owner was not bound to give the minimum 120-day notice. However, the residents argued that there were at least 50 individuals living in the neighborhood (Heinkel-Wolfe, 2019a). This was also a drastic change from 2013, when a state inspection showed that there were 30 water connections serving approximately 90 people (Heinkel-Wolfe, 2019b).

City officials came to the neighborhood and provided information about temporary housing services, thinking that with no water residents were at-risk of becoming homeless. However, the residents were offended because they had no desire to move, especially in the

middle of the school year. The residents were further dis-serviced when the city hosted a community meeting but did not provide a language translator (Heinkel-Wolf & Perez, 2019).

At one point the city recommended that supplies could be manually brought in including community shower facilities. The families felt that this was a dehumanizing suggestion because it would mean bringing their small wet children outdoors in the cold November mornings, along with inhibiting their privacy (Hicks, 2020).

Emergency Council Meeting

The Denton City Council held an Emergency Meeting on November 19, 2019, with the following agenda item:

> *Consider a local declaration of emergency regarding the water service at Green Tree Estates and/or the expenditure of City funds and use of City resources, not to exceed $250,000.00, for the provision of water on a temporary basis and/or temporary water service and water-related resources or infrastructure to the residents of the Green Tree Estates Subdivision for a period of time not to exceed 90 days.* (Emergency Council Meeting, 2019, item 2B).

In other words, declaring an emergency would allow the City to bypass certain laws and procedures to address the severe health and safety issues of the lack water immediately. These policies might include spending large amounts of money on items not included in the annual budget (e.g., the not to exceed cost in the above agenda item, which was lowered by a motion made during the meeting) and making possible modifications to private property using public tax dollars.

Through the emergency order declared at the Emergency Council Meeting, the City delivered large water containers to each home, which water trucks refilled approximately twice per week (Heinkel-Wolfe, 2020). A photograph of the water containers is included in Appendix D. The roads within the neighborhood were temporarily paved so that city trucks could deliver

the water. It took attending many more council meetings, including getting emergency order extensions, for the residents to get through the situation (Hicks, 2020),

Reaching Long-Term Solutions

Due to the community's lack of trust in the city, nonprofit organizations like Habitat for Humanity had to act as liaisons so that residents would allow their private plumbing systems to be inspected (Perez, 2020; Vazquez, 2020). This was problematic because not only did the homeowners have to allow strangers into their homes, but they were concerned that the inspectors would also report them for having unsafe code violations inside their homes causing further problems, such as not passing the inspections necessary for the hookups. The code violations found were very minor. Additionally, the necessary equipment like water meters costed approximately $7,000, making it difficult for residents to afford out of pocket. However, after over a year of community organizing, the neighborhood eventually gained updated pipeline connections that supplied clean water for the homes. These efforts included a community fundraiser that brought in around $45,000 to cover equipment, volunteers helping the residents dig trenches, and generous assistance from a local plumber who helped advocate for the community, offered his professional services, and secured equipment donations (Hicks, 2020).

Theoretical Perspectives

Three major theoretical frameworks related to water poverty, especially at the community level, are conflict theory, systems theory, and social exchange theory. Also discussed is social learning theory as it applies to macro social work education.

Conflict Theory

Conflict theory helps describe current states of social order, disagreements related to social change, and which groups have power and which groups do not. Those in power often

wish to remain in power. Sometimes certain groups in upper socioeconomic classes or otherwise benefit from controlling other people and material resources or are indifferent to such potential harms caused to others (Zastrow & Kirst-Ashman, 2013). This indifference can be more common than overt forms of control but can be just as dangerous. In other words, people with power may make decisions and implement policies that harm others, or bureaucratic systems may systematically cause harm on daily administration levels. However, many people choose to ignore these actions or not speak up, which allows the harmful actions to continue. In the case of Green Tree Estates, on the surface level, it seems like the well-owner and City officials have the most power over the situation, and the residents of Green Tree Estates have the least. As more information emerges, more complex power-struggles will likely become more apparent between the various parties involved.

Systems Theory

Systems theory is an interdisciplinary framework that explores how different components within the environment interact with each other and impact the people living within them. These environmental components are referred to as systems and can be seen at the micro, mezzo, and macro levels (Zastrow & Kirst-Ashman, 2013). From a social work perspective, a client's health and behavior can often be a direct result from the systems a client interacts with. These systems can be relatively small and have a close degree of proximity to clients such as family members and friends. Organizational and community systems are larger and can include schools, local nonprofit agencies, places of business clients frequent, workplaces, healthcare clinics, churches, social clubs, sports teams that clients play on or volunteer for, and local government organizations.

Societal systems are more complex and may sound seem more abstract but still impact individuals on critical levels. A few examples of societal systems are political institutions like the federal government, economic systems like the stock market and banking industries, and legal and criminal justice systems. Programs, policies, and ideas derived from these systems may influence practically anything such the availability and quality of healthcare for individuals, the level of education individuals may achieve, the acceptance of discriminatory practices, and the status of natural environments.

An appropriate analogy to describe systems theory are the components of the human body. Each cell has a purpose and combines with others to support and create tissues and organs. Each organ is part of a system such as the circulatory system, nervous system, and digestive system. The systems work together to create the larger ecological system that is the human body as a whole. Each component, whether it is a red blood cell, healthy appendix, brain neuron, or the heart, plays a role in ensuring that other components are functioning properly and that the body remains alive. If the bone marrow does not produce enough white blood cells to ward off infection, cancer develops, or the kidneys fail, then other systems will be affected causing other critical issues. If a doctor only pays attention to one organ and fails to consider the impact of the disease or treatments on the other organs, then the patient may be in deep trouble.

In the same way, social workers must see clients as one component of larger systems. Instead of trying to "fix" individual clients and client populations themselves as seen in the medical models used in the 1920s to 1960s, the systems perspective widens focus lenses to view individuals and groups as only one part of a wider atmosphere (Zastrow & Kirst-Ashman, 2013, p. 120). As previously discussed, this atmospheric environment can include families, friends, community resources, community centers, healthcare systems, neighborhoods, schools, and other

entities that clients interact with. When a client presents with a problem, social workers need to take a holistic approach to understand what some of the underlying causes may be, what other systems are contributing to the issue, how the client's behaviors are being influenced, and what resources may help.

When applied to issues of environmental justice, clients may be affected by systems pertaining to their personal financial situation (e.g., job, income, availability and trust in banking institutions, access to financial literacy education), which impacts where they live (e.g., urban apartments, suburban houses, in safe or dangerous areas). As previously discussed, where a person lives affects how they live (Philip & Reisch, 2015). This can have ramifications on an individual's and family's physical health and safety (e.g., breathing clean air, drinking clean water), mental wellbeing, education, level of social acceptance, and ability to enjoy nature. These factors can in-turn be impacted by environmental, political, economic, and social institutions and systems like zoning laws, racial segregation and discrimination, and economic development projects. This is just one example of how relatively micro-level systems can influence, and be influenced by, larger macro-level systems resulting in feed-back loops.

Circling back to Green Tree Estates, the primary systems involved are the individuals and families living in Green Tree Estates, Green Tree Estates as a whole, the City of Denton, the local City Council, nonprofits, advocates, media outlets, and the well owner. Also at play are the various legal and political systems that impact laws and policies relating to water quality, water well maintenance, and responsibilities of government institutions toward annexed and privately owned land. Through the previously discussed background research, this study has already seen some ways these systems impacted one another.

Social Exchange Theory

Social exchange theory can be considered an umbrella term among several professional disciplines that looks at problems through analysis of the costs and benefits within human interactions (Barbalet, 2017). According to this theory, people make voluntary decisions based on how they believe relationships and transactions will impact them. Often when individuals encounter new situations, they will ask themselves how much they can get out of the process or relationship and what level of effort they should put into it. The theory assumes that people want to gain as much as they can out of relationships while minimizing their personal costs. Such costs and benefits include an array of social, psychological, biological, and financial factors (McDonell et al., 2006). Specific benefits and resources may include love, affection, social esteem, services, information, money, and goods (Barbalet, 2017). The cost-benefit threshold differs between each individual person depending one's background, personality, and current situational factors (Burns, 1973). For instance, Person A may feel it worthwhile to spend $10 on a friend they like and receive companionship from, as opposed to spending the same amount on someone they dislike. In another scenario, Person B may believe that the social recognition of serving on a charity board outweighs the time and effort involved in doing the work.

Social exchange theory also highlights rewards and punishments, which correlate closely to costs and benefits (Emerson, 1976). People will usually do what they can to gain benefits and positive reinforcement while avoiding entering trouble. Depending on an individual's level of motivation and the situation at stake, a person may be willing to exert high costs to receive rewards or avoid negative consequences or to spend bare minimum costs to do the same. Person A may wish to gain a promotion at work, and thus deem it necessary to put forth high amounts of

effort to do so. On the other hand, Person B may only do the bare minimum to avoid getting termed.

There are several ways that social exchange theory could apply to Green Tree Estates. The most prominent could be Mr. Don Roddy deciding to turn off his well. He calculated that the cost of maintaining the well was too high compared to the level monetary profit he was making. It may also be safe to assume that he did not gain enough rewards or benefits from providing water to the residents to make a difference in his decision.

Other ways that social exchange theory could play a role are the relationship levels between the other parties involved. Advocates may have believed that the social and psychological benefits of helping the residents outweighed the associated costs of time, money, and emotional stress. The theory may also account for some of the attitudes and involvement levels portrayed by community organizations. If public, private, and nonprofit entities ran their own cost-benefit calculations, then the results could have impacted how they wished to proceed with the situation. Some entities may have decided that their calculated threshold warranted spending high amounts of resources to contribute to the situation, and vice-versa.

It is emphasized that the variables involved in the calculations would vary greatly between different individuals and organizations. Even if an entity had a strong, altruistic desire to provide aid, the entity may simply not have enough resources to do so. Just because the calculated return is high (i.e., psychological fulfillment, bringing safety to the residents) does not mean that the entity should necessarily go bankrupt or be otherwise harmed in its pursuit to help the residents. Discussion of this theory is only intended to provide contextual background as to help explain why individuals and entities made certain decisions.

Research Problem

As discussed, water poverty is a more widespread issue in the United States than many people may realize and can result in long-term health effects and trauma. Even when cases are identified, professionals and advocates may not know how to best approach the issue. Therefore, this study examines in further detail the events of the Green Tree Estates case in hopes that professionals and advocates can apply lessons learned in other communities facing similar issues.

A large focus is placed on identifying why Green Tree Estates residents went so long without clean water. This knowledge may help other communities set preventative measures that could keep existing or future cases of water poverty from festering. Another primary focus is assessing the interactions between the different subsystems involved. Aspects of this could include evaluating the quality of communication between residents, city officials, and other stakeholders, and whether each party had the same or different priorities and goals. Advocates in other communities could use this information to better anticipate possible communication challenges and attitudes they may encounter themselves. A third focus is to help identify the roles advocates in the Green Tree Estates case played and what additional advocacy efforts could have been helpful. This could help other communities be more aware of advocacy techniques that they could choose to implement themselves.

Research Questions

The following are the four primary research questions this study aims to answer:

1. What were the initial causes of water poverty at Green Tree Estates?
2. How well was the case handled by city and other community stakeholders?
3. What role did advocates play?
4. What additional advocacy would have been helpful?

Methodology

This study uses a qualitative case study approach to answer the research questions above. The research questions were based on the unique context and series of events regarding the Green Tree Estates water crisis. This study explored the phenomenon in-depth by seeking answers to *why* and *how* questions with emerging and uncontrollable variables. There is a large focus on understanding the interaction between factors previously already happened, and not controlling variables in an experiment. Therefore, a qualitative case study approach is the most appropriate research design for this study (Dooley, 2002; Tetnowski, 2015).

Data collection consists of interviewing stakeholders who were involved with, or were knowledgeable about, the Green Tree Estates water access case. Participants were recruited from two categories: City of Denton officials and community stakeholders (e.g., community advocates from nonprofits and similar individuals). This separation is due to fact that differences in roles, perspectives, and areas of knowledge warrant asking different questions. The goal of interviewing City of Denton officials was to identify specific ways the City handled the case, the case's impact on current and future policies, and how the case of water poverty occurred in the first place from policy and governmental role standpoints. The interview questions that were asked to City of Denton officials were as follows (the numbered questions were asked to every Official interviewed, while the lettered questions were only asked to help guide or clarify the conversations as needed):

1. Tell me about the annexation process of Green Tree Estates?
    a. Did it differ from how the process usually goes?
2. Green Tree Estates reportedly had water quality issues for decades. What are the processes for ensuring water quality for residential use?

3. How did the different levels of government (State, County, City) interact with each other in the handlings of Green Tree Estates?
4. What role did Green Tree Estates residents play in getting access to clean water?
5. How well do you think the city handled the situation as a whole?
    a. What went well?
    b. What did not go well?
6. What are some of the things the City is still dealing with regarding Green Tree Estates?
    a. Examples may include people wanting to move there, roads, trash pickup
7. What do you think the City learned from its experiences with this situation?
    a. How could these lessons be applied the future?
8. What else would you like me to know about anything related to what we discussed?
9. Is there anyone else you recommend I interview as well?

The second category of people consists of community stakeholders not affiliated with the City of Denton who directly contributed to, or were familiar with, advocacy efforts. The goal of interviewing community stakeholders was to gain insights about the viewpoints of the different parties involved, the struggles they faced, what went well and did not go well regarding collaboration efforts, and how similar situations could be handled better in the future. The questions that were asked to the community stakeholders were as follows (the numbered questions were asked to every Official interviewed, while the lettered questions were only asked to help guide or clarify the conversations as needed):

1. How were you involved in the situation with Green Tree Estates and their water issues?
    a. How did you first learn about the water quality issues?
2. What role did you and/or your organization play?

3. What were your observations of other entities involved, like the Green Tree residents, the city, and other nonprofits?
    a. What were the interactions like between the different organizations?
    b. Was everyone on the same page? Why or why not?
4. What things went well?
    a. Collaborative efforts, communication, volunteers, advocacy, etc.
5. What things did not go well?
    a. Collaborative efforts, communication, volunteers, advocacy, etc.
6. What do you think could have been done better?
7. What types of advocacy do you think would have helped or been appropriate?
8. If a situation like this were to happen in a different neighborhood in the future, how do you think it should be handled?
9. Is there anything else you would like me to know about anything related to what we discussed?
10. Is there anyone else you recommend I interview as well?

Procedures

Potential interview participants were identified through purposive sampling, which is a common method in qualitative research. This technique involves selecting individuals or groups who either experienced or had knowledge of a phenomenon being studied (Palinkas et al., 2015). With this said, known individuals who had knowledge of the Green Tree Estates case were invited to participate. The list included community advocates, City of Denton officials, and representatives from other local organizations. These were made known to the Primary Investigator either through previous networking, local media, or through referrals when

associated agencies were contacted. There was also a convenience sampling element because several possible participants already had a level of rapport with the Primary Investigator and were chosen for that reason. This could have meant that people whom the Primary Investigator was not as familiar with could be unintentionally left out. The exact list of names, job titles, and community organizations of the participants were not disclosed in this report to help protect the anonymity of participants.

Recruitment was also done through a referral process. When participants were interviewed, they were asked if they knew of anyone else who might be willing and eligible to be interviewed as well. If they had someone in mind, the Primary Investigator reached out to the other person and formally invite them to participate. Residents of Green Tree Estates were not invited to participate due to reasons listed in the Limitations section.

Recruitment was done by sending individual emails to stakeholders to introduce the study, notifying them of their eligibility to participate, and inviting them to be interviewed. If a person agreed to be interviewed, the Primary Investigator worked with them to schedule a mutually agreeable time and location that was most convenient and comfortable for the subject. The Primary Investigator discussed consent and obtained signed consent forms from subjects who agreed to participate before the interview. Subjects who did not consent were not interviewed. The consent form included a section for participants to consent to being contacted after the interview, and after data analysis began, to provide the Primary Investigator with feedback on the accuracy and completeness of themes developed from the data. This member checking process is explained in the analysis section.

The Primary Investigator conducted individual interviews with the stakeholders to learn about their experiences with interacting with the residents of Green Tree Estates, other

community members, and any policies or decisions they knew of or made themselves that could have affected the situation. The interviews took an hour or less and were audio-recorded on digital recording devices and a laptop. An AI software tool was used via the laptop to directly, and automatically, record the interviews and transcribe the recordings.

A demographic survey was administered to participants at the beginning of each interview. Participants were not required to complete the survey, but all of them chose to do so. The survey collected information such as their age bracket, gender, race, ethnicity, highest education level, and their position level in the organization they represented if applicable (e.g., the City or other stakeholder agency). A blank copy of the survey form is included in Appendix H.

Member checking processes were done remotely using the contact information provided by the participants for the purpose. All study procedures were reviewed and approved by the UTA IRB.

Data Analysis

Throughout the data collection process, the primary researcher kept a field journal to record notes from interviews, new questions that arise, names of people who might be added to the recruitment list, details about member checking processes, and ideas for coding. Maintaining a field journal helped keep the data organized and allow analysis to occur as interviews progressed.

The information gathered from each interview was individually analyzed and cross-referenced with answers from other subjects. Comparisons were made between the answers of the different participants to identify trends and different viewpoints. To aid this process, first and second coding cycles were used (Miles et al., 2020).

The first cycle consisted of identifying deductive and inductive codes and subcodes (Miles et al., 2020). The Descriptive codes were pre-determined words and phrases that were assigned to corresponding data points to help identify data trends based on themes relating to the questions asked. Different types of deductive codes that were included are descriptive codes (words or phrases that describe data points) and evaluation codes (judgments on whether events or actions were positive or negative).

Inductive codes are phrases and keywords that arose as interview participants shared their experiences. The codes may have been specific to a participant's profession, their observations, or other unique attributes that were not previously known to the Primary Investigator. Because this is a relatively new area of research, it was expected that most of the processes in this study were inductive. Some of the inductive codes used included process codes (words that describe actions), causal codes (things that may have caused certain events or actions to occur), and in vivo codes (repetitive or meaningful phrases used by participants) (Miles et al., 2020).

The second cycle consisted of the process used to find meanings of the first cycle codes (Miles et al., 2020). This involved looking at patterns and relationships between the codes, combining similar codes, and categorizing them by similar themes. The data was then assembled in ways that portrayed information in a coherent narrative.

Each question asked, along with the participant's answer, was broken down and analyzed through codes and corresponding themes. Possible trends that were explored include a consensus on how effectively agencies and individuals worked and communicated with each other, what things went well or did not go well, and what types of advocacy would have been more helpful. For example, one of the questions to city officials was, "How well do you think the city handled the situation as a whole?" with possible follow-up questions being, "What went well?" and

"What did not go well?" Deductive code categories were *Handled By: City Staff*, *Strengths*, and *Struggles* which are all descriptive codes. These three codes examine how well individuals reacted to the situation they were presented with given the information they had at the time, evaluating the strengths that the city officials and others involved presented when working through the situation, and things that the city, and possibly others involved, could have done better.

To go into further detail, *Handled By: City Staff* included a subcode specifying *city staff*, opposed to other groups like community advocates or other nonprofits. The code explores the theme of, "How well did city staff react to the situation they were presented with?" This means that it may have involved evaluation coding because it calls upon judgment, and possibly causal coding. The causal codes here were inductive because participants sometimes relayed actions taken based on their current knowledge of the situation and experience related to such matters. In other words, participants told the Primary Investigator that they (or others they know of) acted a certain way because of how they perceived the situation, resulting in a specific outcome. The deductive code *Strengths* helps identify the strengths that the City (and possibly others involved) presented when working through the situation. Likewise, *Struggles* can be defined as, "What were the things the city (and possibly others involved) could have done better to mitigate the problems presented?" Further analysis of these two themes involved evaluation and process coding. An example is that a participant mentioned that *Communication* was a struggle they experienced. *Communicating*, being an action word, is considered a process code. A perceived lack of communication, indicated by a negative sign, would be an evaluation code. Therefore, the code could be displayed as *Communicating (-)* because there was a lack of the particular action. A visual example is included in Appendix E.

As stated, different questions were asked to city staff compared to other stakeholders. Though the interviews with the City of Denton officials will touch on some of the themes other stakeholders will discuss, additional focus will be placed on legal policies and implementation of procedures. This information will partially help identify current political and managerial contexts in which the City of Denton, residents, and other stakeholders had to navigate.

It was anticipated that different stakeholders would have differing opinions on what happened. For instance, a stakeholder from Agency A may think that Agency A handled the situation well, but a different subject may think that Agency A did not do an adequate job. When such discrepancies arose, the Primary Investigator noted them, attempted to identify possible causes, and explored what effects (if any) the different opinions had on collaboration efforts between the different stakeholders.

To help ensure quality research, the Primary Investigator implemented member checking processes. The purpose of this is to ensure that the researcher had an accurate understanding of what the participants said and meant in the interviews and that participant experiences were accurately portrayed in the report. Upon completion of the initial data analysis, the Primary Investigator shared preliminary findings with the interview participants who gave prior consent to be re-contacted. All individuals did consent to be re-contacted, and all but one took the opportunity to provide feedback. The other four either affirmed the accuracy of the data or requested that changes be made. All requests for changes were honored.

Results

The findings in this sections are divided into categories to first describe the demographics of those interviewed, specific questions and answers regarding the original research questions, and background information including a timeline of key events. Additional findings describe

themes of how city officials responded to the situation, important aspects of the community organizing efforts, and how those efforts were viewed by different parties. Participants also had a wide variety of opinions on certain aspects of the situation such as the types of advocacy that were or were not helpful, how well the City responded to the situation, and how specific actions meant different things to different people. Cultural considerations are emphasized because Green Tree Estates residents have different cultural backgrounds than most people working in the City, as well as different experiences than some of the advocates working with them, which had major implications throughout the entire situation. Other themes include strengths and struggles of different parties involved and perspectives on the current status of Green Tree Estates. This section concludes with detailing how participants recommend future situations be handled from city and advocacy perspectives.

As mentioned, there were wide varieties of viewpoints among participants. Sometimes they had different opinions that contradicted each other. As the intent of this study is to avoid casting judgement and using this situation as a learning experience, the data is presented accordingly. The Primary Investigator made good faith efforts to ensure that the voices of the participants are presented with equal weight, and in ways that preserve confidentiality of participants. To help avoid confusion on the reader's part, gender neutral pseudonyms are used to help differentiate various viewpoints. These pseudonyms are derived from the Greek alphabet and are as follows: Alpha, Beta, Gamma, Delta, and Epsilon.

Demographics

There were five participants, which included city officials (two city staff and two city council members) and one community stakeholder advocate who was not affiliated with the City of Denton or ever lived in Green Tree Estates. One city official who was interviewed could have

easily fallen into both categories of city official and community stakeholder advocate. To help preserve participant confidentiality, and to help mitigate the limitation of having such a small sample size, only general themes of the issued demographic survey will be included.

The only participant who was not affiliated with a government entity was the community stakeholder, who worked for a local nonprofit. Most participants held relatively high employment positions where they held executive or planning roles. When asked their gender open-endedly, three participants identified themselves as male and two identified as female. All participants had high levels of education. Three participants had master's degrees, and two had Doctorate degrees or equivalent. Three participants identified as White/Caucasian, one as Hispanic/Latino, and one as Jewish (Ashkenazi). Four participants indicated that they fell within the 36-50 age bracket, and one within the 24-35 age bracket. A summary of the demographic information is in Table 1 below.

Table 1

Demographics

Measure	Item	Count	Percentage
Age	24-35	1	20%
	36-50	4	80%
Gender	Male	3	60%
	Female	2	40%
Race/Ethnicity	White/Caucasian	3	60%
	Hispanic/Latino	1	20%
	Jewish (Ashkenazi)	1	20%
Education	Master's Degree	3	60%
	Doctorate Degree or Equivalent	2	40%
Study Category	City Official (City Council)	2	40%
	City Official (City Staff)	2	40%
	Community Stakeholder	1	20%

Research Questions and Answers

The first question this research seeks to answer was, "What were the initial causes of water poverty at Green Tree Estates?" This is important to know because if the causes can happen elsewhere, then knowing what they are may lead to preventing them from occurring. From the data, it is arguable that this situation stemmed, in part, from a lack of regulatory policies and oversight at multiple levels. Therefore, this discussion emphasizes the need for new policy considerations.

The second question was, "How well was the case handled by city and other community stakeholders?". The data shows mixed responses from participants. Some participants believed that the City handled the case well, and other participants believed the opposite. Likewise, some participants believed that the community stakeholders handled the situation well on their end, and others had mixed feelings on it. It can be said with confidence that city officials and community stakeholders both had their own strengths and struggles.

According to the interviews, some of the strengths portrayed by the city officials were that they quickly did everything they responsibly and legally could do (Participant Alpha), getting water as close to the residents as possible and making it as simple for them as possible to bring it into their homes (Participant Alpha), went above and beyond legal obligations (Participant Gamma), and that staff and some of the other officials worked to do what the residents wanted (Participants Beta and Delta). Some of the noted struggles were that city officials seemed under-prepared when initiating community meetings, were not prepared for the baseline distrust in the City which had to be overcome (Participant Beta), communicating

effectively internally and externally, and some of the language used by city officials caused the residents to feel offended (Participants Gamma, Epsilon, and Delta).

Some of the strengths portrayed by community stakeholders were how advocates empowered residents to speak up for themselves and making their needs known (Participants Alpha, Beta, Gamma, Epsilon, and Delta), organizing community volunteer and fundraising efforts (Participant Delta), and listening to the residents (Participants Delta and Epsilon). Some of the struggles noted by interview participants included difficulties with locating certain resources like pro bono legal services, not all nonprofits serving their client populations with dignity and operating under a philosophy of pity, nonprofits believing they could help more than they could (Participant Delta), and some city officials viewed some of the advocacy efforts as detrimental to collaborative process (Participant Gamma).

The third question asked was, "What role did advocates play?" According to the data, advocates played a huge in in empowering residents, supporting residents throughout the process, raising publicity, and working with nonprofits that specialized in serving the community's culture (Participants Epsilon and Delta).

The last question was, "What additional advocacy would have been helpful?" It was said by participants that they would have liked to see more of the type of advocacy that educated residents on their options and the abilities of the different parties involved, advocacy that was not political or assigned blame, advocacy efforts that worked more collaboratively with the City than fighting against the City (Participant Gamma), and having a wider, preferably pre-arranged, network of advocates, nonprofits, and businesses (Participant Delta).

Order of Key Events

Table 2 below provides a chronological outline of when key events took place. It includes the event category, dates, and a brief description of the event. Information from this table was gathered from participant interviews, original documents, or newspapers.

Table 2

Timeline		
Event Category	**Dates**	**Description**
Water Well Citation	2002	Mr. Roddy received a citation and was ordered to bring the water system into compliance.
Service Plan Adopted	June 2011	Ordinance No. 2011-093 was passed allowing the area to be annexed and included a Service Plan for Green Tree Estates. Residents did not realize that Mr. Roddy had the option of connecting the well to City lines.
Annexation	2013	Green Tree Estates and surrounding areas were officially annexed by the City of Denton.
State Inspection	2013	A comprehensive review conducted by state inspectors showed that the well had 30 connections and served approximately 90 people.
Water Well Citation	2014	Mr. Roddy was fined for the similar problems as in 2002, including operation the system without a license and failing to run water quality tests (Perez, 2019)
Notice of Shut Off	Oct. 19, 2019	Residents received 30-day notice of water shut off
Advocacy Starts	Late Oct. 2019	A council member and nonprofit leader heard about the notice, and together they visited the residents.
State Investigations	Oct. – Nov. 2019	The City of Denton contacted the relevant state departments, which determined that there were not enough connections to consider the well a public water supply. The City disagreed with this finding.
Neighborhood Meeting	Oct. 29, 2019	Residents, city officials, and Mr. Roddy attended a neighborhood meeting. Residents received resources for homelessness and a translator was not present.
Advocacy Increases, Gains Publicity	Oct. – Early Nov. 2019	Volunteers donated water. Advocates acted as liaisons between residents and City, and empowered residents. Residents actively looked for solutions, spoke with city officials at meetings, and made phone calls to the City.
Neighborhood Meeting	Nov. 2019	At another neighborhood meeting, it was suggested by a city official to provide a trailer with showers and toilet stalls, which was deemed inadequate offensive to the residents. During the meeting, residents actively research possible options on their phones, including specific details about water tanks.
Shut Off	Nov. 15, 2019	Mr. Roddy shut off the well. A council member stayed in a resident's home that weekend in solidarity.
Emergency Declaration	Nov. 19, 2019	A local Declaration of Emergency was issued at an Emergency Council Meeting, allocating City funds and resources for temporarily providing water to Green Tree Estates for 90 days. This Order was extended periodically.
Securing a Permanent Solution	Nov. 2019-Sept. 2020	Residents, advocates, nonprofits, and volunteers worked together to secure knowledge, funding, supplies, inspections, and labor to obtain permanent water connections to City lines. Residents as young as 8 years old helped dig the trenches.
Gained Access to Clean Water	July – Sept. 13 2020	Green Tree residents celebrated having clean water flow into their homes. The first household was connected in July, and the last was connected in September. Residents also received garbage and recycling bins from the City.
Ongoing Issues	Present	Residents still struggle with neighborhood roads being in poor condition. This also prevents solid waste trucks from going to their houses directly, meaning they have to roll them at least .2 miles to a main road.

City Perspectives

Annexation and Contributing Factors

Green Tree Estates was part of a larger area that was annexed over ten years ago. It was already completely surrounded by City incorporated land (like a donut hole). Thus, the annexation was very routine and made logical sense. It was also before the state annexation laws were changed in 2019 (the new laws made it more difficult for cities to perform annexation).

But how Green Tree Estates came into existence in the first place was problematic from an urban planning standpoint. For instance, when there is a new subdivision being built, it is standard practice (among urban planning, land development, and related professional fields) that developers are required to show that water is being provided.

Participant Gamma explained that by the time the area was annexed, all the homes and well lines had already been established by the property owner, which was allowable under the less stringent codes and standards of Denton County compared to the City of Denton. According to the Service Plan, it was the responsibility of the property owners to connect to City services, including municipal water services. According to Participant Gamma, this meant that the Service Plan gave Mr. Roddy the right, not the obligation, to hook up his well to City water lines, and he chose not to do so. During the interview, Participant Delta reported that the residents were unaware that Mr. Roddy had been given this option.

Along the same lines, Participant Alpha said that the plat that Denton County approved for Green Tree Estates would not have been approved by the County or City today (a plat is a large, highly detailed document showing what developers intend to build). One of the reasons was that neither of the mentioned government entities would have approved a well serving multiple lots today. Another one of the issues was that the City ended up with a property where

the City had no control of the streets, giving the City limited access to the area. Another concern was that Mr. Roddy (the owner of the well and much of the tract of land) had already subdivided his property and sold lots to separate owners. Some residents owned their land outright, some residents had other landlords, and some properties were still owned by Mr. Roddy. The area was never set up to be a planned development or neighborhood. This was a root cause of many of the issues facing Green Tree Estates. Mr. Roddy still provided well water to them as a private distributor for private lines, and never connected his systems to City lines.

Water Quality Polices. There were limited occasions over the years when Mr. Roddy received fines from the State for poor water quality (Perez, 2019). No notable changes to water quality occurred. In the City of Denton, as well as other cities, water testing is done at least weekly, along with regulatory reporting. Participant Gamma explained that water is tested before entering the system, within the system, and sometimes again at the point of service (sometimes an owner's pipes may be tainted with copper or lead). Mr. Roddy was not required to undergo these tests because he was not considered to own a public water supply.

Initial Reactions to Shut Off

Mr. Roddy decided to shut off the well for personal financial reasons, and only provided the residents with a 30-day notice. Participant Delta first found out about the situation from word of mouth and the newspaper. When Participant Epsilon learned what happened in a memo, Participant Epsilon went to the Green Tree Estates a few days later with a friend, who is a bilingual activist. That was when they found that Green Tree residents had reached out to the City during previous administrations and got the runaround. Participant Epsilon also contacted a leader of another nonprofit organization that specializes in serving immigrant populations.

The impending water shut off caused the City to have immediate health and safety concerns about the residents not having water. The City came to understand that Mr. Roddy only issued the residents a 30-day notice of water shut off, which the City felt inadequate time to find a new source of water (Participant Beta). In contrast, a public water supply system would be required to give at least a 90-day notice. It was reported to the City that the water Mr. Roddy had been providing had been too poor quality to safely use for cooking or showering (Participant Beta).

Obligations

One of the most prominent things that all participants mentioned was the obligations that the City has (Appendix F). These include *legal*, *moral*, and *ethical* obligations. Participants had differing views on what these obligations specifically entailed. Participant Gamma said that once the City becomes aware of a health and safety issue, then the City has an "obligation to make sure that people are not living in unsafe situations." Participant Gamma clarified that under health and safety codes, whether for food safety at restaurants, or building safety in homes and workplaces, the City has certain legal obligations to enforce the codes. This is not because anyone wants to see people removed from their homes or businesses shut down, but because safety codes exist for a reason. At Green Tree Estates, this means that if city staff become aware of an unsafe home, and if the safety problem was not rectified, at some point the City would have to enforce the case and condemn the house.

There was also a question of whether the City should encourage or enable the residents to stay in potentially unsafe environments, or move so they are not being victimized by a slumlord. One of the questions asked was whether the residents should be looking to sue their landlords instead. This goes back to the "moral obligation" of whether the City was morally obligated to

help provide clean water, or help the residents leave by pointing them to legal assistance. Participants closest to the residents, including Participants Epsilon and Delta, said that the City was obligated to provide clean water directly to the residents immediately, as well as provide other services like paved roads and trash pickup.

Complexity

Several participants mentioned the "Complexity" of the situation (Appendix F). Determining ownership and related responsibilities of the land was complex because the Roddy family had rather informally subdivided the area. Different parties involved in this were the residents who owned their homes/land, the Roddy family, out of state landlords, and middlemen who physically received rent and utility money to pass on. According to Participant Gamma, the landlords had varying degrees of involvement with one paying for the water hookup on their property, and some of the others not putting forth near that amount of effort. Distinctions had to be made between public and private property. This complexity made it difficult to address issues related to the water hookups, road maintenance, and easements making it, as Participant Gamma phrased it, like "a law school problem" (Appendix F).

Initial Actions of City – Policy and Intergovernmental Relations

Participant Beta told how the first major action the City took was reaching out to the Public Utility Commission to confirm if the well system met the requirements to be a public water supply. If so, this would at least buy an extra 60 days of time. The City also reached out to legislative consultants to help the City connect with the appropriate agency to conduct a survey (TCEQ). The City tried to get TCEQ to take care of the issue.

Participant Gamma said that when TCEQ conducted their investigation, it was difficult to prove how many people were being served by the well. Residents paid in cash, and few had

receipts. It was determined by the state that there were not enough connections to be deemed a public water supply – a finding the City disagreed with. This was because some of the connections were illicit, or that Mr. Roddy had deliberately turned off water to some of the homes (saying the residents did not pay him last month) so he could be below the minimum number of lines to qualify. Participant Delta noted that when TCEQ conducted their investigation, instead of speaking with the residents directly, they talked to Mr. Roddy who was unreliable because of his position. It seemed to Participant Epsilon that the City and TCEQ were pointing fingers at each other. It was also said by Participant Epsilon that the City still has the obligation to ensure water quality along with TCEQ. When the final determination was made by TCEQ, it was then that the state felt they had no role in the process and left the picture. It also meant that Mr. Roddy was not obligated to meet certain timelines.

Temporary Solutions and Heightened Tensions

There were interim solutions to the problem before the service lines were eventually built. The temporary solution was to deliver non-potable water into large tanks, which was allowed through an emergency order declared by the Council. To implement this order, the City also had to temporarily pave the roads so that the water trucks had access to the neighborhood (Participant Epsilon).

The City also had warehouses full of water, and told the residents that all they had to do was come grab it at no charge. It seemed to Participant Beta like most residents did not, and some may have only been begrudgingly appreciative of it. This was partly because the residents thought the City should have done more to ensure water was being piped into the area.

Participant Delta that there was pushback from the Council about how much funding would be allocated to this issue, and how much responsibility, if any, the City should take for it.

Participant Delta said that one of the arguments the Council gave was along the lines of, "*Why should we declare this emergency for you when other communities would like improvements too?*".

Community Organizing

Interactions Between Residents, Advocates, and the City

Advocates acted as go-betweens between the residents and the City. Advocates contacted the City to see if the City could arrange translators and find a solution. According to Participant Delta, they told the City, "*These are your residents who have been paying taxes. You are required by law to do this."* Advocates empowered the residents by informing them of their rights and encouraging them to speak up and advocate for themselves. Residents spoke with city officials at meetings and called in. Several did interviews with media outlets.

When discussing possible solutions at another neighborhood meeting, it was suggested by a city official to provide a trailer with showers and toilets, which was deemed very inadequate and offensive to the residents and advocates. During the meeting, residents actively researched possible options on their phones, including specific details about water tanks (Participant Delta).

Residents played a huge role in being activists and advocating for themselves. They worked closely with a city official and other activists, and advocacy was very resident driven. Residents expressed what they needed and what they wanted. The community advocates were trying to fight for them and also trying to communicate to the City what the residents wanted. A city official stayed overnight in one of the family's houses the weekend the water was shut off, according to Participant Epsilon, "in solidarity and to help get publicity, because it's one of those things sometimes when the government doesn't work, you just shine a light on it."

It was also said by all participants that there was a significant amount of advocacy in terms of reaching out to city staff and council members, and the advocates did a very good job of making their situation known on multiple levels. It was recognized by Participant Beta that the residents had been living in difficult conditions from several standpoints including water, roads, and housing. The residents were very persistent in making sure the City knew the full scope of their living conditions and their needs. Participant Beta said that it was hard for staff to quickly understand the conditions because of the language barrier, and they had to catch up to all the details of the situation, especially because city staff and city officials were not experiencing the same living conditions. Participant Beta said that most city officials may not have realized a neighborhood with all those issues existed in their own community, so it likely took time to mentally process.

Several other reasons why the City struggled was that city staff did not fully know or understand its resident's history. The resident population did not trust the City, and for much of the process there was no solution in place. City leaders also did not have an example of how another city handled similar issues. City staff is aware that while the City and community worked together to find a solution that solved the water problem they did not create fans, especially with how long the residents had struggled and were counting on the City throwing them a lifeline. Pretty much all the staff and officials wish that the city could have done more, faster.

A common problem that cities encounter is that it can be hard for *any* resident to understand what a city is allowed to do in various situations. It was especially hard for Green Tree residents to understand what Denton was able to do by charter regarding private property.

It became important for the City to have people who could communicate in Spanish, but advocates say that it was not just a translation problem – the City really was not listening. A participant said that there were bilingual speakers involved, so the City should not have any excuses.

Residential Involvement

The amount of advocacy the residents did themselves cannot be overstated. On days they did manual labor in their neighborhood, the women and children helped and made sandwiches and tacos for everyone. According to Participant Gamma, the relationship between the residents and volunteers was really "awesome."

Participant Beta observed that different groups of residents took different courses of action, and probably had their own legitimate reasons for doing so. The first group consisted of two to three households that were consistently engaged. They spoke at council meetings and worked with community representatives from local nonprofits that supported local Hispanic populations. The second group let residents speak on their behalf. The third group appeared disinterested. The fourth group believed that the City would allow the water to be cut off and they would be fine on their own just using store bought water or buffalo trucks on their own. Because of the engagement with the first group, the City knew what residents of those three or so houses wanted, but were challenged with knowing what the residents in the other eleven houses were thinking. Participant Beta said that staff did not want to make big decisions without input from all of the residents. City officials and staff recognized that the City did a lot of work, but the residents did even more.

Networking and Communication

Residents and advocates did a lot of networking with other community nonprofits. Volunteers donated water before the Emergency Declaration and arrival of the water tanks. After the Declaration, local schools found partners to donate pumps to provide pressure so residents could have the water flow directly into their homes (Participant Beta). A local church group also came out and did some repairs (Participant Delta).

To get water hookups within the homes, certain inspections had to be done. However, Participant Delta said that residents had little trust in the City and were afraid that their homes would be condemned for relatively minor things. A local organization helped arrange for licensed plumbers and electricians to work with residents to get their homes up to code, and reports were not made to the city until after the problems had been fixed. This made it so that when city inspectors came out the houses would pass. According to Participant Delta, City staff tried to do what residents wanted. However, they still posed difficulties for the residents because they wanted infrastructures to be a step higher than the code specifies which would have cost more money, but the volunteer plumber was able to help residents work through this.

According to Participant Delta, advocates also networked with local businesses like real estate companies, land surveyors, obtained documents from the city clerk's office, and attorneys. They found a plumber who was very eager to help, and used his network to help get plumbing supplies donated. Community volunteers and other organizations did manual labor to help tidy up the neighborhood alongside the residents themselves. A GoFundMe raised $40,000-$45,000 to pay for meters and equipment. As Participant Delta stated, "the community came together and gave the residents what they could."

Communication Between Community Organizations. Community supporters learned about the issue, and decided to donate their time and resources, primarily through social media outreach by a city official, the local newspaper, and local nonprofits that supported diverse populations. Participant Epsilon said that the communication between different nonprofits, local businesses, community volunteers, and advocates was good and done through social media, text messaging, phone conversations, and in-person meetings. Participant Epsilon continued by saying that it was a well-coordinated grass roots effort.

Different Viewpoints

Views on Community Organizations

Participant Delta observed that some of the local community organizations involved in the process treated the residents like charity by using the tone of "*help them! save them*!" and "some seemed to operate that way in general." Participant Delta said that a lot of organizations "act like the mouthpieces for these communities," but never really take the time to ask community members what they want and need. However, the residents were hardworking people, and not sitting there waiting for somebody to come in and fix everything for them. Participant Delta argued that it should really be about the community coming alongside their fellow community members, "your fellow person" who lives in your same community and helping them with a situation that was beyond their control. Community and volunteers should work together to advance the desires of the actual community.

Views on Other Situational Aspects

Many of the participants had different viewpoints. Most of the city officials interviewed had similar opinions to each other and had opposite opinions than those of the community stakeholder participant. The outlier was one city official who considered themself a community

advocate and activist and became very close to the residents and other advocates during the process, even staying in a resident's home the weekend the water was shut off. It was apparent that community advocates and residents had very similar opinions.

Community advocates and a city official said that the City handled the situation badly, and that it took too much time to achieve the end result. The other city officials said that the City handled the situation well. Participant Delta said that city staff was doing the best they could, and advocates were having to pressure council members to do what they were elected to do, which was to represent the people.

It was agreed by all participants that advocacy was very important and was very much needed. All participants agreed that the residents did a lot of strong advocacy themselves. It was said by Participant Gamma that there were different types of advocacy involved, and that some community advocates did what was described as "hyper-advocacy." This hyper-advocacy did harm or were otherwise detrimental to efforts by pointing fingers at the wrong parties, and/or told residents that the City owed them services when the City did not have that amount of power. For Participant Gamma, it appeared that some of the advocates wanted to place blame somewhere, even if it was at a party that was not directly involved, and "had an attitude of, *how far up the food chain can I get to where it's somebody's fault, and we could make it a big public fault.*" According to Participant Gamma, this led to the residents having high levels of mistrust in the City. Participant Gamma said that the Staff had to work extremely hard to engender trust with the neighborhood because the residents had people in their ear telling them that "*these people don't have your best interests at heart, they're not looking out for you, and they just want to screw you. You have to fight and fight because they're the ones who screwed you over in the first place and they're going to keep at it."* Participant Gamma reported that advocates who were

much more helpful did a more informative route – "*Here's the process. Here's the legal bumpers. Here's what the City is allowed to do, and what they can't do."*

Participant Gamma said that advocacy that types of advocacy that would have been more helpful was advocacy that was there to help engender trust between the stakeholders and to communicate honestly and good faith between the stakeholders. These advocates had no axe to grind. They just worked in good faith and in the best way they knew on behalf of the community and not to advance a political agenda, not to disparage anybody already in public office, or take on City Hall. They just wanted the best possible outcome for the community.

In contrast, Participant Epsilon said that "I represent the people. I don't care who's to blame," and "I was just helping by working with the residents and activists trying to push Council to do the right thing."

Participant Epsilon that one of the arguments from Council was that if the City established clean water for this mobile home community, then it would set a precedent requiring the City to do the same for other communities within its jurisdiction that do not have clean water. However, according to Participant Epsilon, this is not a valid argument because the City should indeed do the same for any of its communities that does not have clean water or other basic resources needed for survival.

Overall, the participants agreed that there was *a lot* of tension between the residents and City. For Participant Delta, "at the beginning there was a giant void," especially because there had not been a lot of community support yet. There was a big disconnect and differences between community organization, the city staff, elected officials, the landowner (Mr. Roddy), and community members. Everyone was on different pages because of different views on

responsibilities. Participant Delta said that monetary costs to address problems often lies on the responsible party, so a major question was determining who these responsible parties were.

While Participant Delta agreed with advocates that the City did not come in with an agenda to be as ugly or disrespectful, but think they might have come in to do the least possible. Participants Gamma and said that they City went well beyond what the City was required to do.

Cultural Considerations

Participants Delta and Epsilon said that the people making decisions for the community were far removed from the neighborhood in terms of socioeconomic factors, and some never even visited it. Participants Delta and Epsilon also said that even many advocates were rather removed from the people they were trying to represent. Even though Participant Delta said that Participant Delta came from similar backgrounds to the residents, had a graduate degree, spoke English, and was not living in a similar situation as the participant had in the past, Participant Delta had trouble relating. Participant Delta said this was why it was especially important to constantly go back to what the community members themselves wanted and needed. Their similar history did not mean that Participant Delta automatically knew what the residents wanted.

Some running themes include socioeconomic status, money, and wealth, and how people want to be perceived. Participant Delta said that most people want a home worth hundreds of thousands of dollars, but cannot afford it, but should still be treated with dignity and respect as do those who do in higher income communities. Participant Beta said that the residents of Green Tree Estates probably felt forgotten because of their socioeconomic status, their depressed neighborhood, and the language barrier. Many of the participants noted that the residents were not wanting the water for free and were perfectly willing to pay for clean water. They just wanted an opportunity to do so.

Seeking Help from City

Residents of Green Tree Estates lived in their chosen community. However, they were still being served very unsafe water. They also faced problems with unpaved roads, no solid waste services, and abandoned structures in their neighborhood that were causing rat issues.

According to Participant Delta, one of the main cultural considerations was that recent immigrants, like some who lived in Green Tree, may not want to ask for help because they do not want to draw attention to their status and situation. They often face many legal and cultural pressures to not rely on certain forms of assistance or services, so they are not seen as burdens to society.

Participant Delta also said that residents had contacted the City during previous administrations and gotten the runaround, but other participants said that the City never knew about these issues until the water was about to be shut off.

Reflections and Perceptions on City and Community Interactions

As the water quality investigations were starting, there was a meeting between residents and city officials. Participant Delta said that advocates realized that "there was a major problem when the City did not provide sufficient translation services" at this first neighborhood meeting and felt "blindsided." At the meeting the residents were given resources for homelessness. To the residents and advocates, this did not seem sincere or as if the City was looking at ways to genuinely help. According to Participant Delta, it was perceived as, "*Sorry, it's bad luck – you're going to have to leave."* It seemed to the advocates that the residents were not receiving decent levels of respect or genuine help from anyone.

Other participants, including Beta, said that with everything happening in this situation, the City did not trust that all the landlords would follow proper protocols of eviction if they did

not want their tenants living in a place without water, so were distributing homelessness resources as a precaution. They did not intend for the materials to be received negatively.

At another community meeting a city representative suggested to bring out a trailer with three shower stalls and three toilets. Participant Delta said it might have been the person's "genuinely best idea," but residents were offended for many reasons, including lack of privacy (especially for their young children), and having to share that small number of facilities with 15 or 16 other households. This is one of the things that residents were being told, not what they asked for or wanted. Advocates said that they do not believe this same suggestion would have been made if the community in question was a very wealthy white neighborhood.

Participant Gamma said that people were "very, very offended" because of some of the comments made by Council regarding the physical state of the area. Most of the homes were not up to code, and others were uninhabitable. Those who were most vocal at council meetings owned their homes, which were much better maintained. The comments made by Council questioned whether the City should hook water up to all the homes, even the uninhabited ones and the ones not up to code. People took the comments as disparaging the community as a whole, and did not mean that the residents who showed up to the Council meetings had those problems.

Participant Delta said that some council members made many comments that were "ugly and unappreciated," and that even if the comments were not intentionally racist and offensive, "it is the effect that matters" (Appendix F). They also said that there were some "really ignorant comments" made that were seen by residents and advocates as having underlying tones of racism, bias, and prejudice (Appendix F). In response, the advocates kept making sure the residents could still advocate for themselves.

Residents were also offended by the City assuming that they would be displaced and giving them resources for homelessness (one of the several causes of "Offense" mentioned in Appendix F). According to Participants Epsilon and Delta, it was also not just about the building they lived in, but about the community and neighbors they were surrounded by (e.g., location was a good combination between rural and urban setting; neighbors would provide each other assistance with taking care of sick children and elderly parents and help each other out financially if need be; and the neighborhood was multigenerational). According to Participant Beta, some of the city officials, especially staff, did recognize why the residents did not want to move. Many of the staff were simply concerned that the landlords would hear of the issue and might decide to kick the residents out. In anticipation of this, City staff offered the residents resources for homelessness. According to Participant Delta, this resulted in the residents thinking that the City was not going to help them and wanted them out.

Participant Delta said that advocates were concerned that the City was counting on not having a lot of pushback and the residents would go along with it because they were used to not being a bother. However, the residents were Googling alternative solutions, like specific aspects of storage tanks, during a meeting with city officials and voicing their suggestions.

Through these conversations, the roads and lack of trash pickup came to light. City trucks would not have been able to deliver water, and, according to Participant Delta, residents feared that fire trucks could not get there either if needed. According to Participant Delta, residents voiced concerns along the lines of, "*Exactly. You're afraid of your city trucks getting damaged. Imagine what we have to go through with our own vehicles."*

One of the underlying concerns for the residents was that the well owner was getting ready to sell some of his land. Residents and advocates thought maybe there was a possibility

that gentrification would occur given the nearby residential developments. It was thought that other entities would believe that the residents would move easily, but residents would not want to move or sell their homes. Overall, the situation required large amounts of advocacy, fighting, and getting people to overcome stereotypes about the community.

Strengths and Struggles

Some of the most prominent strengths exhibited during this period included active community involvement, advocates assisting residents at every step, the City being willing to work with the residents, and the residents being empowered to advocate for themselves. Some of the most prominent struggles involved early breakdowns in communication attempts the City made with the residents, residents feeling like they were not respected or listened to, and legal hurdles that the City was faced with. The parties involved never came to a consensus on what the obligations were or should have been, or which parties were responsible for which roles.

Current Status

Current Status from Community Perspectives

Participant Delta said that this can all still be considered a somewhat temporary solution. It is unknown how long the residents will be able to hold onto their plots of land with the expensive subdivisions growing around them. If they decide to move, advocates will help make sure they get the maximum amount possible. But for now, the residents are content, though they still have to take their trash to the end of the road. Participant Delta also said that one of the good things that came out of the situation was that the owner, Mr. Roddy, was forced to get rid of the abandoned, dilapidated homes. The residents were glad because those were causing rat problems and overall lowering their quality of life.

One of the biggest public needs that was left resolved was that the roads were never permanently fixed. According to Participant Epsilon, the City never figured out the issue of who owned the roads.

Current Status from City Perspectives

Participant Alpha said that some of the things that the City is still working through are future developments and zoning rules. There are some people who own individual lots or are looking to buy them and build manufactured homes there. The City is trying to make sure that they are given a list of steps they need to take to install a safe way to get water. At first, the City was applying the related rules strictly, but realized the uniqueness of the situation, so the City would allow new homes to be built where there were some taken out. However, due to the number of hookups available, most new homes will probably have to put a water line all the way down to the city sewer. According to Participant Alpha, this would "require easements and senior amounts of costs," meaning that it would be a serious investment because of the high costs involved.

Participant Epsilon said that another outcome was that costs involved in the use of interpretation services has likely become more of a value for the City. There were live interpretations at some of the council meetings, and the PowerPoints presented at the council meetings were translated on the website.

Housing, Trash, and Streets. The neighborhood included unoccupied buildings that were deemed substandard. They did not have water or septic lines, and some had such safety issues that they had to be torn down. Participant Beta said that the City also had to stop property owners from renting the remaining unoccupied houses "on the cheap" because of those health and safety concerns. For solid waste provisions, since the City could not permanently fix the

private roads, the solid waste trucks could not go down the dirt roads to perform services, especially after it rained. One option was to place a dumpster at the front of the neighborhood, but it would have been beside a main road. It would have been problematic because it would be a "haven" for illegal dumping, to the extent that the residents would not have enough room in the dumpster for their own trash. So, the best option was to issue trash carts to the residents, which Participant Beta said was still "not the greatest solution" because they still must push them long distances.

Final Reflections from Community Perspectives

It was agreed among the participants closest to the residents that it was good that the neighborhood ended up getting clean water, but it was due to the activists and helping the residents advocating for themselves. It also took a lot of public support and donations from business owners. According to Participants Epsilon and Delta, even though the residents received community support and got water hookups, this is not a "happy story." Participants Epsilon and Delta said that it was a "failure of government," and they "should have had clean water in the first place because it should have been a matter of policy."

Other Future Considerations

What Cities Can Do

Be Proactive, Especially Through Re-Examining Legal Policies. Participant Epsilon said that cities have the responsibility to be proactive and figure out what they can do before disaster strikes. Participant Beta said that cities should do what they can to learn about who all resides in their jurisdiction and their needs. Participant Epsilon said that local governments need to ensure that people have access to clean water, and it is an issue that can and should be solved by better policy and political advocacy. According to Participant Epsilon, individual social

workers and nonprofits probably do not have time or resources to address this issue directly if it arises in their communities, and people should not have to rely on nonprofits to solve all community problems due to resource scarcity.

It was said that the issues Green Tree Estates faced can fall under the umbrella of housing rights, but cities should not let that potential liability be the reason to address such issues. It should be where their values already are. It was recommended by Participant Epsilon that cities directly address related policy issues (like the intersection between private property and health and safety issues) so that they would have to "go above and beyond" for their residents, instead of doing the bare minimum. Cities should have policies in place outlining when cities should involve themselves and use tax money to address certain health and safety situations, and when and how to address landlords or other property owners within city limits who do not maintain their property to respectable standards.

Participant Alpha said that cities need to be careful not to create situations themselves where a community could be left "high and dry." Developers who purpose private streets, like often seen in gated communities, may not be able to maintain them long-term. Participant Alpha said that residents in these neighborhoods will eventually encounter problems they want their city to address, but their city would not be obligated or allowed to do so. When it comes to this matter, at the least, people need to be educated about which entity is responsible for different aspects of their neighborhood and property before they decide to move in. Participant Alpha did note that the City of Denton does have detailed language in the development code to address private streets and ensuring that they will be maintained.

Participant Gamma said that cities should have protocols in place to require awareness of utilities and other aspects of a land or community area that might be annexed in the future. Per

Participant Beta, this situation serves as a "cautionary tale" for residents who are served by a private provider who does not rise to the level of a public water provider. All it takes is for the provider to decide they do not want to deal with it anymore and turn off the service. Cities should keep this scenario in mind when drafting future annexation agreements.

Cities should proactively conduct water quality surveys for all of their residential homes, especially mobile home communities. Regarding mobile homes specifically, Participant Epsilon said that cities should provide incentives and remove barriers so that mobile home communities can form co-ops and truly become owners of their community. Participant Epsilon also said that mobile home communities nationwide often use private well water, and many of those neighborhoods tend to consist of minority groups, which is another reason why cities should be mindful of potential issues and take proactive approaches.

Communicate With Residents. Communications from cities on everything needs to be accessible to all residents whose primary language is not English, including on their websites and published communications. Cities should have resources to communicate with their residents in multiple languages including professional translators and bilingual staff members. Cities should have multiple staff members who speak the language of their residents, whether it be Spanish, Korean, or other languages. A resident being able to walk into City Hall and be able to immediately communicate with staff would go a long way to help them feel comfortable and serve as a strong crisis mitigation tool. Specifically, cities should have a front-line contact in key departments who can speak more than one language. That contact can always go to other coworkers for more specific information and help translate. If a community has Hispanic, Spanish speaking residents, then having Hispanic, Spanish speaking departmental staff (e.g.,

code compliance officers, development services) will allow cities to really hear those concerns and communicate effectively.

When it comes to more official communications (like at formal council meetings) and publications, having professional translators is important. Just because a person can speak two languages does not mean they have the adequate skillset to perform live interpretations. City websites should have the capability to be translated into multiple languages, along with PowerPoint presentations being made at council meetings.

Participant Epsilon said that for written communications that are mass mailed to residents, if it comes down to cost, then it is better to have plain black and white mailers in English and Spanish instead of fancy gloss mailers only in English. Participant Epsilon pointed out that it is a waste of resources if information is mailed to every city household when residents are unable to read them. Participant Delta said that there is the argument that parents may have children who could help translate them, but that children should not have to worry about doing so when they should be enjoying their own free time or doing homework.

Residents not understanding the powers that their cities have and do not have is not unique to Green Tree Estates. In general cities should try to find ways to educate their communities on what cities can and cannot do. Regarding this, Participant Gamma said that "unfortunately, this task is going to be very fact-specific and case-by-case in the extreme," especially if the matter is related to a specific situation. This goes back to what Participant Gamma referred to as a "hyper-advocacy issue," and developing a good basis of trust so that residents believe the city when the city says they have limitations.

As mentioned previously, cities should educate residents on who is responsible for specific things in their neighborhood. Cities should communicate to residents about who they

should file complaints and reports with and were to turn to for certain issues. Governments in general need to educate their citizens about which entities and departments they should reach out to for various issues because Green Tree residents may not have known that they could have reached out to TCEQ or know exactly how to do that.

Internal Culture, Interpersonal Communications, and Policy Governance Roles. Participant Alpha said that the Green Tree Estates situation serves as a "cautionary tale" because it shows how these situations can spring up on cities. Cities not only have to act quickly and be flexible with doing things that fall outside of normal services, they have to be really willing to work with people who have a varied set of needs. Participant Alpha continued with saying that these situations take a lot of extra work to solve a tough problem.

Thorough communication between council members is important. It was said by Participant Gamma that council members should all be on the same page and speak with one voice in this type of situation. It was recommended that council and staff be educated on legal restrictions on what a city can currently do.

Participant Alpha said that cities having a good, collaborative environment is important. To solve situations like this, cities must have good engagement from its legal department, development services, water department, and public communication. Participant Alpha said that having all these people in a room could help each other feel enough support to "dive in" and say, "*We're going to work through this on multiple levels. We're going to figure this out and solve it."* Participant Alpha said that on big projects like this, staff members may feel "siloed and separated" from other coworkers or departments. Therefore, Participant Alpha recommend that departments should ask each other, "*What can we do? How can we help*?".

Participants Delta and Epsilon said that cities should ensure their legal teams do not act as obstacles in addressing issues. They should be open to investigating the best solution for the communities served while still ensuring municipal compliance with state and federal laws and ethical standards. It was recommended by Participant Epsilon that cities should retain a property lawyer for similar occasions, and whenever necessary, who specializes in this kind of land ownership resolution issue. This could help cities gain ownership of roads, if necessary, so that the roads could be fixed. Participant Epsilon said that there is an argument that it would set a precedent for other mobile home communities in the same situation, but that those communities should have assistance too.

Working With Advocates. Participant Beta said that cities should value community advocates, whether they are community residents or someone else, who act like the community's voice. Participant Beta said that Green Tree Estates, like many other communities, does not have an HOA or neighborhood association making this more necessary for them. Participant Epsilon said that activists and advocates do the job of connecting the public to a government that is supposed to represent them, but it should not be necessary in the first place, and that the "residents have the right to equal representation."

Practical Steps for Similar Situations. Participant Beta said that cities should be cognizant of all the areas in their jurisdictions where situations like those affecting Green Tree residents could potentially happen. Participant Gamma said that cities should expect that there will be a "baseline of mistrust" among residents, and there must be time to allow trust to be built. It was said that "trust is key and takes time." Participant Beta noted that when there are council meetings and other major discussions that there should be live translators and headphones

available. Another recommendation was to get a team mobilized as quickly as possible as there cannot be any lag.

Participant Beta said that the city should establish with the residents who is speaking on their behalf. This is so that the city is only interacting with one person who can "lay it all out" for the city. There should be one liaison from the city and one liaison (trusted by the residents) representing the community. Participant Beta compared it to a union representative doing collective bargaining with the rationale that if different staff members are talking to different residents, then there will be questions of "*Who said what to who? Are they understanding this? Are they on the same page"?*

Participant Epsilon said that cities should engage directly with those they should be working with. For instance, if staff wanted to know things then they should hire translators and ask the residents themselves, not just advocates.

Participant Delta commented that people should not make assumptions about those living in mobile homes, or in lower quality homes. Participant Delta said that people who have not even visited those communities "should watch their language" and word choice so as to not disrespect people. Participant Delta said that they "may not mean disrespect," but it can easily have that effect on people "which is what matters."

How Social Workers and Community Advocates Can Help

A key point that Participant Delta made was that if anybody wants to help, "do not assume that you know what's best for the community you're trying to serve." Advocates should "actually ask them" and help them do what it is they want to do, and what they want to accomplish. According to Participant Delta, if advocates and nonprofits think that "we know best then we can cause unintended consequences" and that is the last thing "we want to do."

Participant Delta said that the first step community advocates should take is ask what the neighborhood want for themselves. In this case, it was seeing if Green Tree residents wanted to move or stay. Participant Delta said that if the residents who own their land decide to move, then advocates should help connect them to people who will help them sell for the best price possible. If the residents own their land and want to stay, then advocates should start talking to the city and others who can help advocate for what the residents want.

Participant Delta said that advocates should keep in mind that they are "not the mouthpiece" and do not know better than the residents themselves. It was noted that this process will obviously be different for other types of communities because those of higher socioeconomic statuses and those with HOAs will be more likely already be complaining to their city.

Participant Delta said that advocates should help determine the different roles and responsibilities of different parties. They should ask, "*What responsibility does the government have,"* and if the government cannot help then advocates and community members should turn to nonprofits.

Participant Gamma said that advocacy that would be most helpful is advocacy that is there to help engender trust between the stakeholders, and to communicate honestly and in good faith between the stakeholders. Participant Gamma said these advocates "have no axe to grind." They just work in good faith and in the best way they know how on behalf of the community and not to "advance a political agenda, not to disparage anybody already in public office, or take on City Hall." Participant Gamma said that these advocates just want to get the best possible outcome for the community.

Participant Delta said that when doing advocacy involving gaining community support, especially media outlets, "make sure you have the right narrative going." This can include portraying the neighborhood or population group in ways that promote dignity and respect. It should also highlight the organizations that are doing the most work. Participant Delta also said that outside individuals should be able to get accurate information from their local paper, and not just a magazine from another city.

Participant Delta said to "look at who is being directly impacted and work backwards from there." Some of the questions to ask may include "*Whose responsibility is it to fix it? How did we let it happen?"* Participant Delta said that in the Green Tree Estates case, when children were getting rashes from the contaminated water years ago, that was when a "fuss should have been made but nobody knew."

It was also recommended by Participant Delta that there should be an increased number of community partners in the future. For instance, it was hard to find attorneys to do pro bono work. Participant Delta said that it would have been nice to have a network at various levels (local, countywide, and state), but especially local. There could be an umbrella organization where all the other organizations can come and work together and say, "*Hey, I'm working on this. Maybe another organization wants to help."* Participant Delta said that this way a higher number of people could be involved "because numbers matter."

Participant Delta also said that mental health should be one of the top priorities. Not having secure housing, safe water, and other necessities can put families and individuals in survival mode. This is especially true for those who are recent immigrants or low-income. Participant Delta said that it can be extra hard on kids because they "require consistency." If they are worried about having clean clothes, changing schools in the middle of the year, or losing

their home then they will be very stressed. Participant Delta said that it would be a good idea for professions to provide mental health counseling to the adults and children. Participant Delta acknowledged that there will then be the question of who would pay for these services and said that there is the argument that in the case of Green Tree then the City would pay due to the unintended consequences of prolonging the time it took to find a solution.

Participant Delta noted that oftentimes people will go to other countries to help build wells, but do not look in their own communities who are struggling with the same things. Participant Delta said that individuals and groups who want to help people should look in their own communities first and help without judgment.

Discussion

Research Problem and Questions

To reiterate, the goal of this study was to use a case study of water poverty to inform finding ways that social workers can help mitigate water poverty in the United States, especially in regard to collaborating with those working in local public administration sectors. This phenomenon is more prevalent than most believe and causes within the United States are more likely to include political and managerial factors as seen with Green Tree Estates. Certain policies, or lack of policy enforcement, allowed a gap where contributing managerial actions occurred. Somehow, it seems that a property owner was able to knowingly serve contaminated water to a vulnerable neighborhood.

Water is a human right, and necessary for survival. Therefore, those who are able (i.e., professionals, community decision makers, nonprofits) should address situations involving water poverty in the best ways possible. Social workers and public administrators are likely to be working on the front lines of such a situation if one should arise in their area. These professionals

can face struggles with knowing how to solve the situation because cases of water poverty can be easy to overlook (especially if one is not on the watch for one to begin with), water poverty is likely not something they encountered before, situations can be extremely complex, and there is a lack of existing research on how to approach the issue.

To help alleviate knowledge gaps, this case study asked questions pertaining to identifying the initial causes of water poverty at Green Tree Estates, how well the case was handled by those involved, the role that advocates played, and what additional advocacy would have been helpful. The main goal of asking these questions was to help identify ways that social workers and other advocates can collaborate with other professionals to help mitigate similar situations in the future. As previously discussed, it was found that establishing trust and a collaborative environment between community stakeholders and government entities is crucial for achieving efficient results, and that proactively addressing policies and creating professional networks is also vital for more streamlined processes. The answers to these questions, as well as the questions asked during the interviews, help paint a more complete picture of what happened at Green Tree Estates and provide suggestions for how similar situations can be approached in the future.

Other key points are that cities, social workers, and advocates must all be prepared to hear and discuss different viewpoints of different parties, take time to establish trust, eliminate communication barriers early, speak in ways that allow all parties to feel respected, and brace themselves for tackling a highly complex problem. Even if blame is to be had, residents, advocates, and city officials should place their focus on coming together to find solutions, while still being as fair as possible with identifying any responsible parties and holding them accountable. Additionally, social workers, advocates, and government entities can take proactive

approaches to preventing neighborhoods having contaminated water in the first place, and to have systems ready to address the problem if it does occur.

Addressing Future Situations from a Social Work Standpoint

In general, social workers should recognize that not all communities experiencing water poverty will need or want assistance and should make their decision to intervene accordingly. If social workers are addressing a case involving water poverty, then they should approach with a humble state of mind and be mindful of any cultural or language differences. They should ask the community what they want for themselves (Participant Delta). Advocates must be mindful that they are "not the mouthpiece" and do not know better than the residents because clients are the experts in their own lives (Participant Delta). They should always do what the residents want, not necessarily what they think is best for the community. Social workers and other advocates should look at who is being directly impacted and work backwards from there (Participant Delta). Stated another way, social workers should formulate plans based on the desires of the client population in need, opposed to implementing seemingly easier interventions that risk not addressing their concerns. Social workers and advocates should not think of residents as a charity case, but rather as their own neighbors needing a helping hand. To treat residents with pity or similar is offensive and may even hinder efforts to help them achieve empowerment.

One of the primary needs identified through this study is that there should be a cohesive network of community partners already in place (Participant Delta). Coordination efforts between nonprofits, advocates, local governments, and philanthropic business owners will be easier if these entities already have working relationships with each other. Social workers can proactively form local networks of nonprofits, businesses, and professionals who can work together to help address local problems, including potential water crises. Social workers can

reach out to various organizations like United Ways and other nonprofits, businesses, and private practices to see what resources exist, and to gouge interest in forming a coalition or other form of network. Such networks should consist of diverse types of credentialed professionals (e.g., translators, plumbers, realtors, civil engineers, attorneys, planners, public health workers, consultants), municipal services, nonprofits, and those who could help represent the demographics and cultures within the community. The primary intent of these networks is for organizational representatives and individuals to agree to be contacted if a humanitarian need in the community arises and commit to at least consider providing assistance within their ability. This will allow caring and philanthropic community leaders to already be on-call when an emergency occurs, preventing stress and saving crucial time. If possible, social workers could also explore options to create regional or statewide networks as well. As seen with Green Tree Estates, residents and advocates found themselves calling legal providers, real estate professionals, and other entities in hopes they could be of service. Without the assistance of the local plumber, including donations from the plumber's supply network, Green Tree residents would not have had such as positive outcome as they did.

Another broad consideration is that social workers should make mental health of the residents one of the top priorities by helping locate mental health providers who could do neighborhood visits (Participant Delta). Adults and children residing in Green Tree Estates faced immense trauma. They were uncertain of whether they could keep their homes or be suddenly forced out, children in need of consistency were likely wondering if they would experience homelessness or change schools in the middle of the year, and residents faced socioeconomic and cultural hurdles. The stress of being in survival mode can easily have detrimental impacts. If funding can be located, then it is prudent that social workers give residents options to speak with

mental health professionals and other social workers to help both the adults and children navigate through their situations.

Social workers and advocates should be mindful of how they interact with others. The most helpful type of advocacy is that which helps engender trust between the stakeholders, and that communicates honestly and in good faith between the stakeholders (Participant Gamma). If decisions are made to involve media outlets, then advocates should ensure that the right narrative is circulating (Participant Delta). This can help highlight the efforts of the residents, advocates, and organizations involved, and help make sure that the words used respect the client population.

Practical Steps for Social Workers

If a social worker recognizes that a population in their community or client system does not have access to clean water within their homes, and makes the decision to help, then there are multiple ways they can do so at micro, mezzo, and macro levels. Before getting involved, the social worker should recognize that not all communities will need assistance. One of the interview participants pointed out during the interview that many neighborhoods already have homeowners' associations or similar, or the knowledge and cultural readiness needed to reach out to their city or other appropriate entities themselves, though some like Green Tree Estates need extra support to do this. A social worker who is considering intervening needs to approach the situation with a humble state of mind and be aware of any cultural or language differences between themselves and the residents. It is important that the social worker always does what the residents themselves want, not necessarily what they think is best for the community. Additionally, the social worker should not think of the residents as a charity case but rather their own neighbors who need a helping hand.

If the social worker does decide to offer assistance, then the first step they need to take is to connect with a gatekeeper, or a trusted member of the affected area or neighborhood (for simplicity for this discussion, the term *neighborhood* will most often be used but it may also be considered a community, residential group, housing complex, or other appropriate terms on a case-by-case basis). This could be done through the help of the person who brought the situation to the social worker's attention (if the individual belongs to the neighborhood), someone already known to represent the community, or a nonprofit representative who serves the neighborhood population. Such nonprofits could include public healthcare workers, those serving specific racial or ethnic groups, members of certain socioeconomic statuses, immigrants or refugees, or other matching aspects. Social workers may also consider reaching out to a local church or other place of worship, or any social groups the neighborhood residents attend.

Once an individual or small group is found whom the residents would trust, the social worker can work with them to establish a trusting relationship with the residents. This may involve the gatekeeper(s) evaluating the need for clean water within the neighborhood, providing translation assistance, and determining if the social worker's assistance is wanted. The social worker needs to let the gatekeeper(s) know what types of help they can provide and would only do as the neighborhood wishes. If the neighborhood refuses the social worker's presence, then the social worker must respect this, though it may be appropriate to let the gatekeeper(s) know of other possible resources the neighborhood could access to obtain clean water. If the social worker's presence is wanted, then they should work directly with the residents to explore possible options.

Such options may include contacting the water provider or other landlords involved and take legal action if necessary and requesting water quality testing from government entities. The

entity depends on the state and exact location of the neighborhood, and could include state, city, or water district departments. Other options may include residents choosing to relocate or other courses of action available in relation to the specific situation. Regardless, the social worker must allow the residents themselves to make their own decisions. Once a decision is made, social workers should do what they can to help the residents follow through with their decision.

If the residents choose to move, then social workers could help find ways to sell their homes for the best price possible or help them find new places to stay within their price range. Otherwise, the social worker could help identity the appropriate organizations and professionals to contact such as attorneys, realtors, public health professionals, state or county departments, city staff and elected officials, plumbers, nonprofit organizations, and mental health professionals. The specific entities, and the order of contacting them, will largely depend on the circumstances of each situation.

The social worker should empower the residents to advocate for themselves. The social worker should consider helping the residents form a committee to gather input from the other residents and accomplish tasks like making phone calls, helping coordinate between different entities, decide upon any publicity they wish to pursue, and gain community support like fundraising. The social worker may help provide the committee with direction and continue to help locate resources such as funds to pay attorney fees or other services. If outside individuals become interested in being advocates themselves, especially if they are professionals belong to local businesses or nonprofits who are willing to provide resources, then the committee might consider making them ex-officio members of the committee or a committee partner.

The social worker should also help locate mental health care for both children and adult residents who are likely in survival mode. This could help bring comfort to the children and help adult, especially parents, with stress management and other case management needs.

After the residents gather information about the complexity of their situation such as roles of responsibility, land ownership, possible legal courses of action, and all the entities that need to be involved (i.e., attorneys, water district, local government, state agency), then the social worker could help residents develop an action plan.

Once the primary entity that the neighborhood will be working with is identified (for the purposes of this discussion it is a city), neighborhood residents and advocates should then work with their city in the most collaborative way possible. While it may be expected for multiple residents to attend council meetings or other community meetings, it would be wise for the committee to consider appointing a spokesperson to act as a liaison between the neighborhood and city once an initial relationship has been established. Likewise, the city could appoint a liaison of their own. This could help expediate communication because there will be less of a question of who spoke with who and what exactly was said. The residents need to advocate for themselves, let their needs be known, and be actively involved with identifying and implementing solutions with assistance from the social worker as needed.

A checklist of these steps can be found in Appendix G.

Addressing Future Situations from a Public Administration Standpoint

Public administrators, whether they work for local municipalities, counties, or state departments, are likely one of the first people to receive calls from residents and advocates about water issues. Due to the nature of this case study, this discussion focuses on how city officials can best intervene if their city is one of the primary stakeholders. However, the concepts are

applicable to other government organizations that are heavily involved with addressing problems of localized water poverty. Key discussion points include city officials proactively analyzing their jurisdictions to identify potential problems, finding ways to effectively communicate with residents with different cultures and languages, and examining current policies with an anticipatory mindset. If a city does learn of an active situation, then there are specific things officials should consider doing immediately from internal and external standpoints.

Proactivity

Local governments like cities and counties can take proactive measures including monitoring development in unincorporated areas and having thorough pre-annexation procedures. These procedures should include performing a complete analysis of what utilities and infrastructures are already in place before annexing a specific area. Though time consuming, cities who have already annexed areas, or areas that staff does not encounter on a regular basis, should consider checking in to see how those areas are faring (Participant Beta). Overall, cities should be "cognizant" of areas in their jurisdictions where situation like Green Tree "could potentially happen so that appropriate preparations can be made (Participant Beta).

Cities should know what languages are spoken by their residents and have ways to quickly and effectively communicate with all of their residents to help everyone have equal access to their government staff and representatives (Participants Alpha and Epsilon). Cities should also explore ways that they can communicate to residents what roles different departments and staff have, and what their capabilities and limitations are for various residential concerns. Unfortunately, this is difficult to do beforehand because the information will likely be case specific. Additionally, if a city annexes an area, then officials should clearly communicate

service plan details with any residents, businesses, and property owners within the newly incorporated region.

Examine Policies. Cities should consider examining their current policies to see if changes are needed to accommodate any anticipated limitations preventing them from fully addressing situations in which residents do not have access to clean water. If cities do not already, they should have set policies detailing how situations involving the maintenance of private property should be handled so that other residents do not come to harm and provide more straight forward avenues to help residents already affected. Cities should proactively communicate these policies to their residents, especially in neighborhoods with privately owned infrastructures. At the least, cities should consider warning residents in possibly problematic situations (including gated communities) of what municipal limitations are regarding infrastructural maintenance. It should also be communicated that policy changes at local levels may be quite difficult, or even impossible, depending on state laws. Even if a city goes as far to hold a charter amendment election, some desired changes will not be allowed due to legal restrictions from higher levels of government.

These restrictions make it necessary to advocate for changes to state and federal policies. At the state level, changes could include tighter restrictions for what constitutes a public water supply or stricter regulations for privately owned wells that serve more than one household. There should also be more thorough investigation processes for investigating contaminated water, which include speaking with everyone possible who is served by the water supply. Current loopholes should be closed so that a water provider cannot close connections to avoid them being counted in an investigation. State policies could also be changed to allow cities more freedom to address complex situations involving similar private property and public health

concerns themselves. Possible federal policy changes could involve mandatory testing of well water by the EPA, especially when there is a public health concern, as well as a more uniform or strict definition of what constitutes as a public water supply.

Internal and External Engagement. Organizations contend with addressing both internal and external affairs. Before a city can adequately solve a community problem, city personnel should quickly form a strategy for how staff and officials will effectively collaborate with each other and the residents they serve. When a city first learns about a situation comparable to the Green Tree Estates water crisis, there are general actions that official should immediately take.

Like social workers, staff and officials should enter the situation with appropriate mindsets. They must be flexible with doing tasks and projects that fall outside of normal services. They must realize that effectively handling the situation will disrupt their routines, involve additional time and effort, and may also require spending unbudgeted funds to address the neighborhood's need for clean water. They must be ready and willing to work with people who have a varied set of needs, and brace for tackling a highly complex and time-consuming problem.

As Participant Beta said, cities should get an internal staff team mobilized quickly because there cannot be any lag. This team should consist of representatives from all the various departments involved (i.e., water department, planning, city manager's office, finance, communications, legal). City staff should do what they can to provide themselves with a healthy, collaborative culture to allow department representatives to work each other in the same room and assist each other on an individual level so no one becomes siloed and feel like they are working alone.

Cities should ensure that their legal teams, or any attorneys they add on retainer specifically for this situation, are able to help identify creative solutions to allow cities to assist

as much as possible while still honoring state laws and the tax dollars of other city residents. City personnel should expect a baseline of distrust among residents and allow time for building trust. and giving consistent, non-contradictory information to residents and advocates will assist greatly in this effort. While staff and elected officials will have different duties and likely different opinions, they should provide as much of a united front as possible to promote communication and trust with residents. This is especially true when making clear to the residents what their current capabilities and limitations are in ways that residents trust that those are indeed the city's capabilities and limitations. Legal teams can provide guidance to elected officials and staff regarding what actions cities can take so that everyone is on the same page.

City personnel should familiarize themselves with the neighborhood in question as much as possible because they will be making decisions that directly affect the residents. They will be more likely to make wise suggestions and decisions if they have visited the neighborhood and understand the residents' own desires as much as possible. Staff and officials should educate themselves on the neighborhood's culture, especially if there are large demographic differences between the affected neighborhood and wider community or city decision makers. One of the most obvious differences could be language differences. Staff must address any language barriers immediately and prepare to communicate with individuals and large groups of people. If hosting a meeting with people who speak a different language, then it is recommended that cities have live translators with headphones available.

Other cultural differences can be more subtle. Residents may not be initially comfortable with seeking help, some immigrant populations may be even less familiar with specific governmental functions or legal policies than their native counterparts, and their cultural values may affect their actions and decisions. Such actions and beliefs may be surprising to local

officials but gaining cultural awareness can help officials understand rationales and promote a more collaborative environment. City personnel should not make assumptions about the community without first visiting and speaking with residents. City personnel should also choose their words carefully when speaking about the neighborhood or with residents. Even well-intentioned comments may be taken as offensive, which can derail trust and collaborative efforts.

On more external levels, when it comes to working with residents, cities should engage directly with those they are serving (i.e., hire translators and speak with residents when gathering information, and not only relying on advocates). Once the residents and city officials establish two-way communication, city personnel should appoint a staff member to act as a liaison with residents (and preferably with a single person speaking on their behalf as well). As discussed previously, this can help track what things were said and to whom preventing potential chaos.

All organizations (including cities) working to address the situation should do their upmost best to do what the affected residents want and need for themselves. If an organization is unable to effectively help, then the organization should ensure that the residents fully understand why and assist the residents find alternative solutions and resources.

Cities are still encouraged to work closely with the social worker throughout the process as able. Once courses of action have been chosen by the neighborhood and primary entities involved then residents, the social worker, and other advocates involved can help implement some of the plans. Assuming that it will be an expensive and community involved process, this stage of community organizing efforts may include updating any existing publicity narratives with the determined solution(s) to help secure supply donations, raise monetary donations through an official fundraiser for supplies or professional services, and recruit volunteers for manual labor or similar needs. Cities should understand that the social worker can help identify

and secure resources to help implement the solution(s), help facilitate communication and efforts between the different entities involved, make suggestions to the neighborhood committee regarding social media or local media content, and appropriately assist with any other needed advocacy efforts (especially if the residents are facing issues other than clean water). Aa previously stated, the social worker can provide encouragement, empowerment, and other appropriate forms of support to the neighborhood residents throughout the process. Together, social workers and public administrators can combine their skills so that residents gain access to clean water as quickly as possible without further trauma.

Implications for Professional Obligations and Collaboration

Social workers have an ethical obligation to advocate for environmental justice because studies have shown that environmental injustices like water poverty can have a negative impact on mental and physical health, life expectancy, and socioeconomic development (Cuskelly et al., 2019. Social workers are ideal to help combat water poverty due to the profession's principles of social justice, respect for diverse cultures, and ability to work in direct-practice and higher community and political levels. Social workers can learn to help identify when water poverty is occurring, the underlying causes, and ways to empower affected individuals and communities to obtain access to clean water.

Water poverty can also be easily linked to long-standing social work goals and intervention strategies. Much of water poverty relies on sustainable community development, which affects client systems (individuals, families, small groups, organizations, and communities). If social workers wish to protect the environment and help client groups build social capital (having social capital can make it more likely for officials to listen), social workers should combine community intervention with the environment and strategies to eradicate poverty

(Ibobor, 2017). Social workers should also include natural and built environments in person-in-environment assessments and re-think certain practices and assumptions like prioritizing the autonomy of individuals above collective responsibility and community rights (Philip & Reisch, 2015).

Although social workers can be multi-talented, they typically lack knowledge of how to navigate local bureaucratic mechanisms, specific laws, and development regulations. Another barrier is that social workers are apt to have full-time jobs at agencies with missions and job duties that do not directly relate to environmental justice. Social workers may not have any connections to neighborhoods they hear are experiencing water poverty and might view it as something they are unable to solve. Even if a social worker discovers that a client is experiencing systematic water poverty, the social worker probably will not have enough time and resources to thoroughly address the problem. Entire neighborhoods can easily fall through the cracks as a result. Therefore, it is vital that social workers collaborate with other professionals to help clients and community populations access clean water whenever possible (Ibobor, 2017). The questions then turn to identifying which other professional groups social workers should network with.

It might be wise for social workers to consider involving community health workers (CHW). A CHW is a "frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served," allowing the CHW to link community members to health and social services (American Public Health Association, 2021, par. 2). In situations of water poverty, a CHW can help with community asset mapping processes and power relationships between groups, and can educate, empower, and mobilize the community to advocate for and gain access to clean water (Philip & Reisch, 2015).

Other professional groups that may be able to help are urban planners, civil engineers, lawyers, inspectors, city council members, and other public and nonprofit administrators (Philip & Reisch, 2015). However, care should be taken when reaching out to other professionals and organizations because their intervention powers may be limited and standing policy procedures could cause mistrust and harm to the community requiring assistance.

Theories in Action

The three theories previously discussed were conflict theory, systems theory, and social exchange theory. These theories were already applied to information gathered from the literature review, but data collected from participants exemplifies some of the real-life applications of the theoretical frameworks.

Systems theory played a large role in the Green Tree Estates situation because each system involved, from individuals to families to organizations, made decisions based on the other systems at play. The City of Denton was tasked to address the situation because other systems (such as the TCEQ and PUC) said that they were not responsible, and the City had to work within state and federal laws. Wider cultural systems contributed to how residents felt they needed to act, such as initially not drawing attention to themselves. There were difficulties with finding certain resources, such as pro bono legal services, because those resources were encased in their own systems. However, the community organizing efforts managed to connect the different systems involved (e.g., residents, individual advocates and nonprofits, community partners and donors, City Council, City staff, and the plumber and his supply network) in ways that eventually brought clean water to the neighborhood.

Social exchange theory also played a large role because some organizations, like some legal services, were unable to provide assistance even though they may have wanted to. As

mentioned, these organizations were likely working in their current system network and did not have the time or resources to spare for the residents, especially if they did not receive benefits in exchange. It can be argued that both social exchange and conflict theory impacted Mr. Roddy's decision to turn off his well. It appeared that he desired personal gain in the forms of saving his time and money from not properly maintaining the well because running the well was not profitable for him. He also appeared indifferent to the harm the contaminated well water caused the residents, and the problems that directly occurred from turning off the well entirely.

Limitations and Recommendation for Future Research

The most prominent limitation was the lack of time available to conduct this study, which limited how much time the Primary Investigator was able to spend in the field. Only a small number of people were interviewed, and they were only interviewed once. Longer term research like ethnography or participatory action research could prove valuable for researchers with more time. Future researchers may also wish to consider researching situations of water poverty as they are unfolding, and appropriately support communities as they navigate the processes necessary to obtain clean water. Not only would this allow communities to receive assistance in real-time, but researchers may be able to directly observe how community interactions transpire. Future researchers may also wish to take the time to interview a broader pool of stakeholders such as state policy makers and environmental enforcement organizations.

Second, the primary data source for this study was information garnered from interviews with a limited number of stakeholders. The lack of voices from the Green Tree Estates residents themselves notwithstanding, by only talking to these individuals this study could have miss more in-depth information regarding laws, nuances of local cultures and politics, matters related to civil engineering and public works, and opinions on best practices from other experienced

professionals. In the end, only four City of Denton Officials and one community stakeholder were interviewed. The city officials were an even mix between City Staff and Council Members, though one person could have fit in either the city official category or community stakeholder category due to their high level of involvement in advocating with the residents. While City Staff and City Council could be considered different categories, because it was unknown how many of each would be participating at the beginning of the study and the questions were the same, both groups were combined into one to help preserve anonymity. However, the study still holds rigor because the key informants were all directly involved in the situation, had a wide range of backgrounds, experiences, and opinions which allowed diverse representations of events.

A third limitation of this study was that the residents of Green Tree Estates did not participate in this study themselves, so their voices were not included. Originally, the Primary Investigator wanted to interview a small focus group of residents to include their perspectives on what happened. This study was about their neighborhood and their struggles, so the Primary Investigator believed that they should have the main stage. However, the Primary Investigator did not speak Spanish which was the only language the would-be participants knew. There was an attempt to have a Spanish speaking facilitator whom the residents trusted help lead a focus group interview, but the attempt fell through. There were also not enough funds to hire a professional translator. To help compensate for this limitation, some of the stakeholders asked to participate in this study were community advocates who were as close to the residents as possible.

Additionally, by only exploring what happened in Green Tree Estates, the information gathered from interviews only pertained to the events that occurred locally. While this is not a limitation itself, it does mean that all data brought to light through these interviews may not be

generalizable There was a high probability that what the stakeholders say would not be transferable to other communities as they will likely be speaking only from their personal experience with this one situation. Even if a perfect intervention technique for Green Tree Estates could be identified, it could not be overly generalized and applied perfectly to other cases. Due to local politics, cultures of the neighborhood and surrounding city, resources available, and individuals involved, the approaches would need to be adapted even if working with a neighborhood fifty miles away. However, communities with similarities to Green Tree Estates would likely have the most commonalities between processes. Such similarities include communities that are low-income, communities whose residents have different qualities than people living in surrounding areas by means of culture, race, ethnic backgrounds, and languages spoken, and whose residents require extra support in effectively communicating with public officials. One cookie-cutter intervention strategy would not be feasible, but social workers can apply general ideas and guidelines from this study to their own practices.

Potential Significance to Social Work

This study carries potential significance to aspects of the social work profession relating to practice, research, policy, and education. If social workers can better identify water poverty when it happens, and they have the permission, ability, and resources to appropriately intervene, then clients and communities may gain access to clean water years before they would have otherwise, and with minimal trauma involved. Regarding environmental justice as a whole, this study could have implications for encouraging and empowering people to care for their surrounding environment not just for the environment's sake, but for how humans can be affected by own actions on their surrounding ecosystems.

Practice

For social workers actively practicing with individuals, groups, and directly with communities, it is hoped that social workers will be better equipped to identify if their clients or client populations are experiencing water poverty and know how to best react, or even be involved in prevention. Knowing which professional groups to network with, available community support systems, and basic applicable legal policies can help social workers navigate these complex situations.

From reading the case studies highlighted in this project, social workers may be more attuned to the needs and experiences of certain vulnerable populations. These may include building trust and gaining access to the affected individuals through gatekeepers, possibly needs for language translation services, or preparing for the likely event of outside parties not considering the desires of the affected community members. Social workers may also realize that, considering the details of their specific situations, they may not be suited to aid people directly themselves. This study could help these social workers recognize which other professions and community they might bring in instead to help address the problem.

Social workers should understand current legal policies surrounding clean water access and engage in political advocacy when appropriate. There are many laws and policies in existence that regulate water access and water quality to residential homes. But as seen with Green Tree Estates, these laws may not be adequately enforced causing issues of water poverty. Depending on the specific water source, its location, and the number of people served, there may not be any laws that ensuring the water is safe to drink. This study may be able to help social workers recognize if they are encountering gaps in regulations and enforcement, as well as giving them an idea of where they could begin their political advocacy efforts (e.g., level of

government, commissions, or special districts). Advocating at state levels might be the most prudent because many regulations are determined by individual states, many policies are enacted and enforced by states, and local governments may not have the power to change certain rules even if they wanted to due to state powers.

Research

Social workers and local government organizations conducting research themselves, or who rely on research to enhance their practices, can potentially benefit from this case study. Individuals and organizations should consider partnering with professional researchers like environmental researchers and urban planning researchers. Thus far, relatively few studies exist on the topic of intersection of social work and water poverty, and especially how social workers can best collaborate with local governments to address these situations. This small exploration helps point to what future research efforts might consider when determining exact topics, research questions, and study designs. Furthering such research could help develop best practices for social workers to follow if their client populations experience water poverty.

As previously mentioned, possible design considerations include participatory action research (PAR) and ethnography. With PAR, if a situation is occurring in which a neighborhood does not have access to clean water, then a researcher could collaborate with the community in real time to help solve the problem while identifying which processes worked the best. Ethnography could be used to more closely examine how cultural differences affect a neighborhood's willingness and ability to seek and receive assistance.

Research questions may include how social workers can best form local and statewide inter-professional networks, and which types of professional services would be most useful for various situations. This is because social workers may struggle with forming such networks , or

if they are assisting with a large community problem they may not know which types of professionals would be helpful with some of the intricacies involved. More exploration needs to be done to help determine the extent of water poverty and water scarcity in the United States, especially among urban, suburban, and rural areas. It seems to be a more common problem than people commonly assume, and these statistics could help communities know whether they should actively be on the lookout for this in their neighborhoods.

It would also help to know more details about how socioeconomic factors may impact access to clean water. This could help communities proactively identify pockets in their area that have the potential to be most affected. For example, if cities decide to check-in on areas they have previously annexed or do not interact with as much, then the research could help point them in the direction of neighborhoods they may need to check-in on first (i.e., low-income or non-English speaking compared to wealthier English speaking neighborhoods). It could also help social workers know which client populations they may need to conduct additional screenings for to help ensure they have access to clean water in their homes.

Education

This study and other related research have implications for social work education for both social work students and licensed social workers obtaining continuing education credits. Social workers can be formally trained to identify when their clients and client populations may be lacking clean water and how to best react. Topics that learners may explore in this arena could involve advocacy, client empowerment, community organizing, the importance of understanding and communicating with other cultures than their own, intergovernmental relations, the importance of interprofessional collaboration even outside of typical helping professions, and theoretical aspects including systems thinking and relational transactions. Being familiar with

these concepts can not only help social workers be better prepared to help pave pathways towards safe water, but also be more well-rounded professionals.

Specifically, university social work programs may consider integrating related content into current courses, especially those that all students are required to take. How social workers should interact with varying levels of local governments and state departments could be included in policy courses and other macro-focused courses. Current macro-focused courses could also include different types of community organizing and related processes, and how to empower local populations groups to advocate for themselves. Both micro and macro courses could include ways that social workers can work with other agencies and professionals to support and advocate for their client populations, especially when more knowledge is needed, other types of professional services are required, and when the workload exceeds what one social worker can provide.

Universities should also consider offering programs that pair social work students with other student professionals so they can learn from each other before entering the workplace. Social work students could meet with students from public administration, nursing, public health, and other departments so that they can gain an understanding of different professional roles in a community, what each profession values (including their different codes of ethics), and how they might collaborate with similar professionals in the future.

Professional development opportunities, including continuing education courses, could provide narrower approaches based on how social workers of various specialties can if a client population lacks clean water, help begin community organizing and networking efforts and contribute to existing community organizing and networking efforts. There could also be courses that teach the basics of what other professions do, and how social workers can collaborate with

them on behalf of their client populations. Like the interdisciplinary programs that universities might implement, it may be possible for social workers and other professionals to attend the same course, learn from each other, and both receive continuing education credit for their respective credentials.

Conclusion

As seen, ensuring that all neighborhoods have access to clean water is a highly complex issue involving legal, political, financial, communication, and cultural hurdles. Individuals within an affected neighborhood may struggle with determining which organizations in their community they feel are trustworthy and able to help. Residents with different cultural backgrounds or socioeconomic statuses than their wider community may feel like they do not even belong in town depending on how isolated they feel or interpret different actions.

Social workers who have the opportunity to help should empower the affected residents so that they can feel comfortable advocating for themselves, help connect them to resources, enlist the assistance of other types of professionals, and help facilitate collaborative efforts between different organizations. Social workers should help residents advocate for their needs and desires so they can live in a safe environment.

Social workers wanting to assist a community gain access to clean water should make themselves aware of the basics of laws and procedures affecting land use, enforcement of water quality, private versus public ownership of property, tenant rights, and similar matters. They should also be mindful of how different levels of government function in relation to the issue, especially navigating the roles of different municipal departments and decision makers. Though the situation is likely to be complex, social workers risk doing harm if they jump into a situation without knowing some of the basic concepts related to the matter they are intervening in.

Overall, certain changes in policies and procedures, along with early interventions, may help prevent situations like Green Tree Estates from happening in other places, or keep current situations from escalating. Advocacy from residents themselves, assistance of community leaders, effective collaborative efforts between organizations, and support from the wider community can all help communities in need gain access to clean water flowing into their homes.

References

Abdelmawla, M. (2017). Water poverty and its impact on income poverty and health status in Sudan: The cause of Gezira Stata (1993-2013). *International Journal of African Development*, *4*(2), 99-109. https://scholarworks.wmich.edu/cgi/viewcontent.cgi?article=1107&context=ijad

Al Key/DRC file photo. Heinkel-Wolfe, P. and Perez, Z. (2020, February 05). Denton continues to work with Green Tree residents on water issue. *Denton Record Chronicle*. Retrieved November 18, 2020, from https://dentonrc.com/news/denton-continues-to-work-with-green-tree-residents-on-water-issue/article_e8e7f6d9-39eb-5587-8457-985fe57d47aa.html

American Public Health Association. (2021). *Community Health Workers*. American Public Health Association. Retrieved September 16, 2021, from https://www.apha.org/apha-communities/member-sections/community-health-workers.

Anderson, M. (2020, January 14). *Racist housing practices from the 1930s linked to hotter neighborhoods today*. NPR. Retrieved September 22, 2021, from https://www.npr.org/2020/01/14/795961381/racist-housing-practices-from-the-1930s-linked-to-hotter-neighborhoods-today.

Anderson, N. E. (1994). The visible spectrum. *Fordham Urban Law Journal, (21)*3 *Article 13,* 723-738. https://ir.lawnet.fordham.edu/ulj/vol21/iss3/13.

Bakker, K. & Hemson, D. (2012). Privatising water: BoTT and hydropolitics in the new South Africa. *South African Geographical Journal, (82)*1, 3-12. https://doi.org/10.1080/03736245.2000.9713679

Ballew, M., Maibach, E., Kotcher, J., Bergquist, P., Rosenthal, S., Marlon, J., and Leiserowitz, A. (2020). Which racial/ethnic groups care most about climate change?. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.

Barbalet, J. (2017). Social exchange theory. In B. S. Turner (Ed.), *The Wiley Blackwell Encyclopedia of Social Theory*. John Wiley & Sons, Ltd. Doi: 10.1002/9781118430873.est0117

Bipartisan Policy Center. (2016 September). America's aging water infrastructure. 1225 Eye Street NW, Suite 1000, Washington, DC 20005. https://bipartisanpolicy.org/download/?file=/wp-content/uploads/2019/03/BPC-Aging-Water-Infrastructure.pdf

Brennan, E. M., Jones, K. R., and Bender, R. E. (2017). Gentrification and displacement: An environmental justice challenge for social work in urban environments. In M. Powers & M. Rinkel (Eds.), *Social work promoting community and environmental sustainability: A workbook for global social workers and educators* (Vol. 1, pp. 175-191). International Federation of Social Workers. ISBN: 978-3-906820-10-1

Brody, S. (2013) The Characteristics, Causes, and Consequences of Sprawling Development Patterns in the United States. *Nature Education Knowledge* 4(5):2 Retrieved May 22, 2022 from https://www.nature.com/scitable/knowledge/library/the-characteristics-causes-and-consequences-of-sprawling-103014747/

Burns, T. (1973). A structural theory of social exchange. *Acta Sociologica, (16)*3, 188-208. https://doi.org/10.1177/000169937301600303

Butner, North Carolina (n.d.). Code of ordinances. *Butner, North Carolina, Article 11.* American Legal Publishing. https://codelibrary.amlegal.com/codes/butner/latest/butner_nc_ldo/0-0-0-4671

Camilleri, M. A. (2017). Corporate sustainability and responsibility: Creating value for business, society and the environment. *AJSSR 2,* 59–74. doi: 10.1186/s41180-017-0016-5

City of Cibolo. (n.d.). *Annexation and ETJ*. City of Cibolo Texas. Retrieved October 28, 2021, from https://www.cibolotx.gov/608/Annexation-and-ETJ. \

City of Denton Development Code § 7.6.16 (n.d.). https://library.municode.com/tx/denton/codes/development_code?nodeId=CITY_DENTONDECO_SUBCHAPTER_7DEST_7.6WAWA_7.6.16ALWASEFA

City of Denton (2021). *Geographical Information Systems (GIS) map*s. https://www.cityofdenton.com/266/Geographical-Information-Systems-GIS-Map

City of Pflugerville, Texas. (n.d.). Extra-Territorial Jurisdiction (ETJ). Retrieved May 22, 2022, from https://www.pflugervilletx.gov/city-government/development-services-center/planning-department/extra-terratorial-jurisdiction-etj

Cornell Law School (n.d.). Legal Information Institute. *De Facto Segregation.* https://www.law.cornell.edu/wex/de_facto_segregation#:~:text=During%20racial%20integration%20efforts%20in,civil%20rights

Crowder, K. & South, S. J. (2008). Spatial dynamics of white flight: The effects of local and extralocal racial conditions on neighborhood out-migration. *Am Sociol Rev., (75)*5, 972-812. doi: 10.1177/000312240807300505

Cuskelly, K., McCann, T., & Murphy, N. (2019). Impacts of environmental, social, and economic injustices on mental wellbeing with the traveler community in Ireland. In M.

Powers & M. Rinkel (Eds.), *Promoting community and environmental sustainability: A workbook for global social workers and educators* (Vol. 2, pp. 156-170). ISBN: 978-3-906820-14-9

Dallas County, Texas. (n.d.). *Zoning and other related regulations*. Dallas County. Retrieved October 29, 2021, from https://www.dallascounty.org/departments/plandev/zoning.php

Debrunner, G. & Hartmann, T. (2020). Strategic use of land policy instruments for affordable housing – coping with social challenges under scarce land conditions in Swiss cities. *Land Use Policy*, *99*(2020), 104993. https://doi.org/10.1016/j.landusepol.2020.104993

DeMaria, K.B. (2015). Spatial patterns of municipal annexation and the impact on the cost of police services. *Undergraduate Honors Theses.* W & M ScholarWorks, Paper 130. https://scholarworks.wm.edu/honorstheses/130

Dooley, L. (2002). Case study and theory building. *Advances in Developing Human Resources, (4)*2, 335-354. Sage Publications.

Economic & Planning Systems, Inc. (2020, January 9). *Growth and annexation policy white paper: Issue analysis* . The City of San Antonio. Retrieved May 22, 2022, from https://www.sanantonio.gov/Portals/0/Files/Planning/Annexation/Converse/Converse%20Jan%202020/183101-Final%20White%20Paper%201-9-2020.pdf?ver=2020-02-07-085515-220

Elmendorf, W., Gerhold, H., and Kuhns, L. (2005). A guide to preserving trees in development projects. *The Pennsylvania State University, College of Agricultural Sciences, Agricultural Research and Cooperative Extension.* Retrieved May 22, 2022 from https://extension.psu.edu/a-guide-to-preserving-trees-in-development-projects

Emergency Council Meeting. (2019, November 15). Denton City Council. Special Session Called, Denton City Hall. https://dentontx.new.swagit.com/videos/38030

Emerson, R. (1976). Social exchange theory. *Annual Review of Sociology, (2)*1976, 335-362.

Ewing, R. (1997). Is Los Angeles-style sprawl desirable? *Journal of the American Planning Association, 63,* 107-126. http://dx.doi.org/10.1080/01944369708975728

Frumkin, H. (2002). Urban sprawl and public health. *Public Health Reports, 117*(3), 201-217. https://doi.org/10.1093/phr/117.3.201

Fry, H., & Reyes-Velarde, A. (2019, February 20). *California wastes most of its rainwater, which simply goes down the drain*. Los Angeles Times. Retrieved November 17, 2021, from https://www.latimes.com/local/lanow/la-me-rainwater-lost-wet-winter-california-20190220-story.html

U.S. Global Change Research Program. (n.d.). *Climate Change Impacts on Society*. Globalchange.gov. Retrieved May 22, 2022, from https://www.globalchange.gov/climate-change/impacts-society

Goh, K. (2019, February 28). Urban waterscapes: The hydro-politics of flooding in a sinking city. *International Journal of Urban and Regional Research, (43)*2, 250-272. https://doi-org.ezproxy.uta.edu/10.1111/1468-2427.12756

Graham, G. N. (2016). Why your zip code matters more than your genetic code: Promoting healthy outcomes from mother to child. *Breastfeed Med., 11*, 396-397. doi: 10.1089/bfm.2016.0113.

Grennell, A. (2018, July 16). *Why 96 million plastic 'shade balls' dumped into the La reservoir may not save water*. PBS. Retrieved October 30, 2021, from

https://www.pbs.org/newshour/science/why-96-million-plastic-shade-balls-dumped-into-the-la-reservoir-may-not-save-water

Gross, L. (2012, June 12). *Pollution, poverty and people of color: Don't drink the water*. Scientific American. Retrieved September 10, 2021, from https://www.scientificamerican.com/article/pollution-poverty-people-color-dont-drink-water

Gross, T. (2017, May 03). *A 'forgotten history' of how the U.S. government segregated America*. NPR. Retrieved October 31, 2021, from https://www.npr.org/2017/05/03/526655831/a-forgotten-history-of-how-the-u-s-government-segregated-america

Hanna-Attisha, M., LaChance J., Sadler, R. C., and Schnepp, A. C. (2016). Elevated blood lead levels in children associated with the Flint drinking water crisis: A spatial analysis of risk and public health response. *AJPH Research, 106*(2), 283-290. https://doi.org/10.2105/AJPH.2015.303003

Hansen, K, Hughes, S., Paine, A., and Polidori, J. (2021). Drinking water equity: Analysis and recommendations for the allocation of the state revolving funds. *Environmental Policy Innovation Center*. University of Michigan, School for Environment and Sustainability. Retrieved May 22, 2022 from https://static1.squarespace.com/static/611cc20b78b5f677dad664ab/t/614ce18c71125612978901b5/1632428438124/SRFs_Drinking-Water-Analysis.pdf

Heidecke, C. (2006). Development and evaluation of a regional water poverty index for Benin. *International Food Policy Research Institute, Environment and Production Technology Division.* EPT Discussion Paper 145. https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/35556/filename/35557.pdf

Heinkel-Wolfe, P. (2019a, October 29). Water options running low for small mobile home neighborhood. *The Denton Record Chronicle.* Retrieved from: https://dentonrc.com/news/denton-neighborhoods-public-water-supply-problems-buried-in-bureaucratic-maze/article_18037aba-d30c-5a00-9b47-fb9928c68620.html https://dentonrc.com/news/water-options-running-low-for-small-mobile-home-neighborhood/article_555c6e97-92d0-5d37-b237-3c2c55167ef9.html

Heinkel-Wolfe, P. (2019b, December 19). Denton neighborhood's public water supply problems buried in bureaucratic maze. *The Denton Record Chronicle.* Retrieved May 22, 2022 from: https://dentonrc.com/news/denton-neighborhoods-public-water-supply-problems-buried-in-bureaucratic-maze/article_18037aba-d30c-5a00-9b47-fb9928c68620.html

Heinkel-Wolfe, P. and Perez, Z. (2020, February 05). Denton continues to work with Green Tree residents on water issue. *The Denton Record Chronicle*. Retrieved from: https://dentonrc.com/news/denton-continues-to-work-with-green-tree-residents-on-water-issue/article_e8e7f6d9-39eb-5587-8457-985fe57d47aa.html

Hicks, T. (2020). After months of struggle, a Denton neighborhood finally gets clean water. *Dallas Observer.* Retrieved from: https://www.dallasobserver.com/news/residents-in-dentons-green-tree-estates-win-long-fight-to-get-access-to-clean-water-11949276

Houston, S. (2019). *Municipal annexation in Texas*. Texas Municipal League. *https://www.tml.org/DocumentCenter/View/1233/Annexation-Paper-TML-July-2019PDF*

Ibobor, S. O. (2017). The role of social workers in promoting sustainable community and environmental development. In M. Powers & M. Rinkel (Eds.), *Social work promoting community and environmental sustainability: A workbook for global social workers and*

educators (Vol. 1, pp. 121-132). International Federation of Social Workers. ISBN: 978-3-906820-10-1

Jarvis, D. (2019). Environment justice and social work: A call to expand the social work profession to include environmental justice. *Columbia Social Work Review, 11*(1), 36-45. https://doi.org/10.7916/cswr.v11i1.1935

Jeff Woo/DRC file photo. Perez, Z. (2019, November 09). Small Denton neighborhood seeks viable water options as they prepare to lose current service. *Denton Record Chronicle.* Retrieved November 18, 2020, from https://dentonrc.com/news/denton/small-denton-neighborhood-seeks-viable-water-options-as-they-prepare-to-lose-current-service/article_d26a6601-c96a-5620-939c-a9d0c3063953.html

Jorgenson, A. K., Hill, T. D., Clark, B., Thombs, R. P., Ore, P., Balistreri, K. S., & Givens, J. E. (2020). Power, proximity, and physiology: Does income inequality and racial composition amplify the impacts of air pollution on life expectancy in the United States? *Environmental Research Letters. 15*(2020) 024013. https://doi.org/10.1088/1748-9326/ab6789

Lufkin, B. (June 15, 2017). Why 'hydro-politics' will shape the 21st century. *BBC Future.* Retrieved April 28, 2022, from https://www.bbc.com/future/article/20170615-why-hydro-politics-will-shape-the-21st-century

Maqbool, A. (June 16, 2015). The Texas town that banned fracking (and lost). *BBC News.* Retrieved May 22, 2022 from https://www.bbc.com/news/world-us-canada-33140732

Masten, S. J., Davies, S. H., & Mcelmurry, S. P. (2016). Flint water crisis: What happened and why? *J Am Water Woks Assoc. 108*(12), 22-34. https://www.doi.org/10.5942/jaww.2016.108.0195

Mathew, L. E., Piedra, L. M., Wu C., Diaz, A. K., Wang, H., Straub, A. P., & Nguyen, T. H. (2016). Social work and engineering: Lessons learned from a water filtration project in Guatemala. *International Social Work, 60*(6), 1578-1590. https://doi.org/10.1177/0020872816655869

McClure, E., Feinstein, L., Cordoba, E., Douglas, C., Emch, M., Robinson, W., Galea, S., & Aiello, A. E. (2019). The legacy of redlining in the effect of foreclosures on Detriot residents' self-rated health. *Health Place (55),* 9-19. doi:10.1016/j.healthplace.2018.10.004

McDonell, J., Strom-Gottfried, K. J., Burton, D. L., Yaffe, J. (2006). Behaviorism, social learning, and exchange theory. In Robbins, S. P., Chatterjee, P., Canda, E. R. (Eds.). *Contemporary human behavior theory: a critical perspective for social work*. Pearson. pp. 349–85. https://collections.lib.utah.edu/ark:/87278/s6ff49xc

Miles, M. B., Huberman, A. M., & Saldaña, J. (2020). Chapter 4: Fundamentals of Qualitative Data Analysis. In *Qualitative Data Analysis: A Methods Sourcebook* (pp. 61–99). Sage Publishing. ISBN: 9781506353074

Miller, V. D. (1994). Planning, power, and politics: A case study of the land use and siting history of the North River Water Pollution Control Plant. *Fordhan Urban Law Journal (21)*3 Article 12, (707-722). https://ir.lawnet.fordham.edu/ulj/vol21/iss3/12.

Mixon, J., Dougherty, J. L., & McDonald, B. N. (2021). Texas municipal zoning law (3rd ed.). LexisNexis and Matthew Bender & Company. Ch. 1 § 1.200, 1.2005, 1.212, Ch. 8 § 8.105.

Molle, F., & Mollinga, P. (2003). Water poverty indicators: Conceptual problems and policy issues. *Water Policy, 5*(5), 529-544. https://www.doi.org/10.2166/wp.2003.0034

National Association of Social Workers. (2017). NASW code of ethics. Retrieved May 21, 2022, from https://www.socialworkers.org/About/Ethics/Code-of-Ethics/Code-of-Ethics-English

Noble, C. (2016). Green social work – the next frontier for action. *Social Alternatives. 4*(35), 14-19.

Office of the Attorney General of Texas. (n.d.a). *Colonias Prevention.* Retrieved September 16, 2021, from https://www.texasattorneygeneral.gov/divisions/colonias-prevention

Office of the Attorney General of Texas. (n.d.b). *Renter's Rights.* Retrieved September 16, 2021, from https://www.texasattorneygeneral.gov/consumer-protection/home-real-estate-and-travel/renters-rights

Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Adm Policy Ment Health 42*(5), 533-544. doi:10.1007/s10488-013-0528-y.

Paxton, K. (2022, March 04). City of Denton repeals mask mandate after AG Paxton lawsuit. Ken *Paxton Attorney General of Texas Press Release.* Retrieved May 22, 2022 from https://www.texasattorneygeneral.gov/news/releases/city-denton-repeals-mask-mandate-after-ag-paxton-lawsuit#:~:text=Attorney%20General%20Paxton%20has%20announced,Abbott's%20Executive%20Order%20GA%2D38.

Peeters, J. (2017). Promoting sustainability by a paradigm shift towards commons. In M. Powers & M. Rinkel (Eds.), *Social work promoting community and environmental sustainability:*

A workbook for global social workers and educators (Vol. 1, pp. 146-160). International Federation of Social Workers. ISBN: 978-3-906820-10-1

Perez, Z. (2019, November 09). Small Denton neighborhood seeks viable water options as they prepare to lose current service. *The Denton Record Chronicle*. Retrieved from https://dentonrc.com/news/denton/small-denton-neighborhood-seeks-viable-water-options-as-they-prepare-to-lose-current-service/article_d26a6601-c96a-5620-939c-a9d0c3063953.html

Perez, Z. (2020, September 13). Water Crisis Over for Seven Homes at Green Tree Estates. *Denton Record Chronicle*. Retrieved from https://dentonrc.com/news/water-crisis-over-for-seven-homes-at-green-tree-estates/article_efdf7d0f-1b23-5efb-a74d-6fe6fbf8f32d.html

Plumer, B., Popovich, N., & Palmer, B. (2020, August 24). How decades of racist housing policy left neighborhoods sweltering. The New York Times. Retrieved August 20, 2021, from https://www.nytimes.com/interactive/2020/08/24/climate/racism-redlining-cities-global-warming.html.

Popescu, I. (2018). Racial residential segregation, socioeconomic disparities, and the White-Black survival gap. *PloS One, 13*(2): e0193222. Published online February 23, 2018. doi: 10.1371/journal.pone.0193222

Preston, B.L. & Stafford-Smith, M. (2009). Framing vulnerability and adaptive capacity assessment: Discussion paper. CSIRO Climate Adaptation Flagship. http://www.csiro.au/org/ClimateAdaptationFlagship.html

Rabb, H. (2017). Sustainable wellbeing and social work with children: Promoting our connectedness with nature through nature-assisted interventions. In M. Powers & M.

Rinkel (Eds.), *Social work promoting community and environmental sustainability: A workbook for global social workers and educators* (Vol. 1, pp. 133-145). International Federation of Social Workers. ISBN: 978-3-906820-10-1

Ramsay, S. & Boddy, J. (2017). Green social work through an experiential learning framework. In M. Powers & M. Rinkel (Eds.), *Social work promoting community and environmental sustainability: A workbook for global social workers and educators* (Vol. 1, pp. 74-88). International Federation of Social Workers. ISBN: 978-3-906820-10-1

Rivas, M. & Keomoungkhoun, N. (2021, June 07). Why doesn't Sandbranch, near Dallas, have running water? *The Dallas Morning News,* 1B-2B.

Robinson, T. M., Shum, G., & Singh, S. (2018). Politically unhealthy: Flint's fight against poverty, environmental racism, and dirty water. *Journal of International Crisis and Risk Communication Research, 1*(2), pp. 303-324. https://www.doi.30658/jicrcr.1.2.6

Ruckart, P. Z., Ettinger, A. S., Hanna-Attisha, M., Jones, N., Davis, S. I., & Breysse, P. N. (2019). The Flint Water Crisis: A Coordinated Public Health Emergency Response and Recovery Initiative. *Journal of public health management and practice, JPHMP, 25 Suppl 1, Lead Poisoning Prevention*(Suppl 1 LEAD POISONING PREVENTION), S84–S90. https://doi.org/10.1097/PHH.0000000000000871

Setthasakko, W. (2009). Barriers to implementing corporate environmental responsibility in Thailand: A qualitative approach. *International Journal of Organizational Analysis*, *(17)*3, pp. 169-183. https://doi.org/10.1108/19348830910974905

Shafritz, J. M., Russell, E. W., Borick, C. P., & Hyde, A. C. (2017). *Introducing public administration*. Routledge. ISBN: 978-1-138-66634-4

Shalamzari, M. J. & Zhang, W. (2018). Assessing water scarcity using the Water Poverty Index (WPI) in Golestan Province of Iran. *Water, 10*(8), 1079. https://doi.org/10.3390/w10081079

Squires, G. D. (2002). Urban Sprawl and Uneven Development of Metropolitan America. In *Urban Sprawl: Causes, Consequences and Policy Responses*. ed Squires, G. D. Washington DC: The Urban Institute Press. ISBN: 0-87766-709-8

Tetnowski, J. (2015). *Qualitative case study research design. Perspectives of Fluency and Fluency Disorders, 25*(May 2015), 39-45. doi:10.1044/ffd25.1.39 Copyright © 2015 American Speech-Language-Hearing Association

Texas Local Government Code § 43.003 (2021), https://statutes.capitol.texas.gov/Docs/LG/htm/LG.43.htm

Texas Local Government Code § 43.056(f) (2021), https://statutes.capitol.texas.gov/Docs/LG/htm/LG.43.htm

Texas Municipal League. (n.d.). *Policy*. Texas Municipal League. Retrieved May 22, 2022, from https://www.tml.org/101/Policy

Texas Municipal League (2016, August 19). Court strikes down Laredo's plastic bag ban. Legislative Update, 2016 Number 30. https://www.tml.org/DocumentCenter/View/867/08-19-2016-Legislative-Update-Number-30-PDF?bidId=

The State of Texas. (2021). *Water wells*. Texas Groundwater Protection Committee. Retrieved September 16, 2021, from https://tgpc.texas.gov/water-wells/.

Thomas, K., Hardy, R. D., Lazrus, H., Mendez, M., Orlove, B., Rivera-Collazo, I., Roberts, J. T., Rockman, M., Warner, B. P., & Winthrop, R. (2019). Explaining differential

vulnerability to climate change: A science review. *WIREs Climate Change*, *10*(565). https://doi.org/10.1002/wcc.565

Town of Flower Mound, Texas (n.d.). Open space: Our common ground. *Town of Flower Mound, Texas*. Retrieved May 22, 2022 from https://www.flower-mound.com/DocumentCenter/View/23158/Open-Space--Our-Common-Ground

Town of Oro Valley (2020). *Annexation strategy*. https://www.orovalleyaz.gov/files/assets/public/documents/town-manager/annexation/annexation-strategy-updated-8.12.20.pdf

UN-Water. (n.d.). *Climate change: UN-water*. Water and climate change. Retrieved May 16, 2021, from https://www.unwater.org/water-facts/climate-change/

U.S. Department of Commerce. (2021, August 13). Climate change impacts. Climate change impacts | National Oceanic and Atmospheric Administration. Retrieved May 22, 2022, from https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts#:~:text=The%20most%20vulnerable%20groups%2C%20including,compounding%20factors%20from%20climate%20change

U.S. Department of Energy, Office of Legacy Management. (n.d.). *Environmental justice history*. Energy.gov. Retrieved April 28, 2022, from https://www.energy.gov/lm/services/environmental-justice/environmental-justice-history

U.S. Environmental Protection Agency. (n.d.). Water efficiency for water suppliers. EPA. Retrieved October 30, 2021, from https://www.epa.gov/sustainable-water-infrastructure/water-efficiency-water-suppliers

U.S. Environmental Protection Agency. (2020, December 08). *Heat islands and equity*. EPA. Retrieved September 16, 2021, from https://www.epa.gov/heatislands/heat-islands-and-equity.

U.S. Environmental Protection Agency. (2021, January 07). *Protect Your Home's Water*. EPA. Retrieved September 16, 2021, from https://www.epa.gov/privatewells/protect-your-homes-water

U.S. Environmental Protection Agency. (2022, February 24). *Heat Island Effect*. Retrieved April 27, 2022, from https://www.epa.gov/heatislands

Van Oel, P. R. & Hoekstra, A. Y. (2010). *The green and blue water footprint of paper products: Methodological considerations and quantification (Research Report Series No. 46)*. UNESCO-IHE Institute for Water Education. https://waterfootprint.org/media/downloads/Report46-WaterFootprintPaper_1.pdf

Vazquez, L. (2020, August 12). City of Denton extends disaster declaration for community without water. *WFAA*. Retrieved from https://www.wfaa.com/article/news/local/city-of-denton-extends-disaster-declaration-green-tree-estates-no-water/287-a2f8c47a-9591-4fa7-920f-026dbeaf7bd9

Water Systems Council. (n.d.). *When is a Well a Public Water System*. wellcare® -- Water Systems Council. Retrieved November 18, 2021, from https://www.watersystemscouncil.org/download/wellcare_information_sheets/other_information_sheets/When-Well-is-a-PWS.pdf

Watkins, A. J., & Fleischmann, A. (1980). Annexation, migration and central city population growth. *Social Science Quarterly, 61*(3/4), 612–622. http://www.jstor.org/stable/42860774

Whittemore, A. H. (2021). Exclusionary zoning: Origins, open suburbs, and contemporary debates. *Journal of the American Planning Association, 87*(2). doi: 10.1080/01944363.2020.1828146

Woo, B., Kravitz-Wirtz, N., Sass, V., Crowder, K., Teixeira, S., & Takeucki, D. T. (2019). Residential segregation and racial/ethnic disparities in ambient air pollution. *Race and Social Problems, 11*(1), 60-67. doi: 10.1007/s12552-018-9254-0

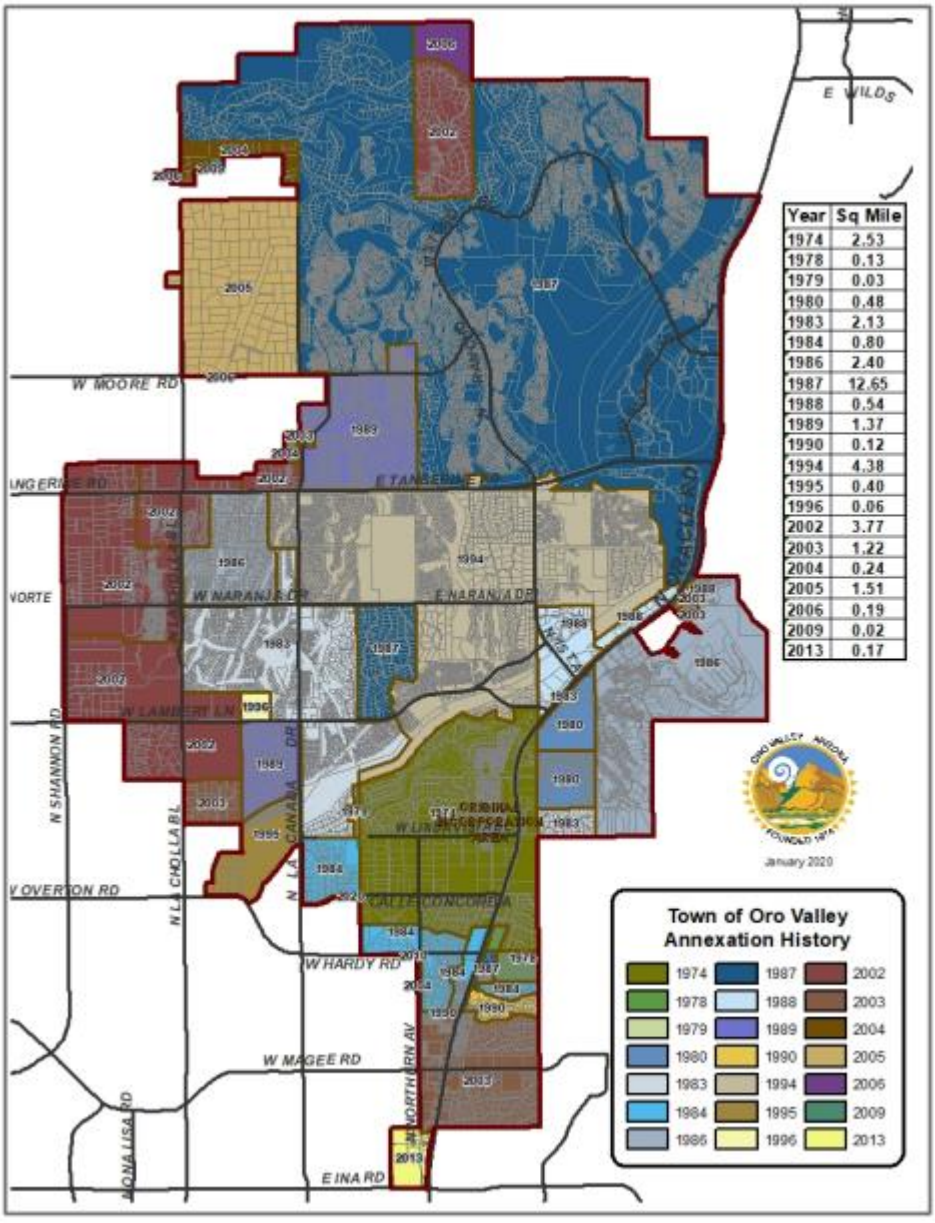
Woodard, T. (2019, November 12). Some city of Denton taxpayers are days away from losing water service. *WFAA.* Retrieved from https://www.wfaa.com/article/news/local/some-city-of-denton-taxpayers-are-days-away-from-losing-water-service/287-03f9e413-0001-4a7d-817e-4fd906d0c87f

Zastrow, C. H. & Kirst-Ashman, K. K. (2013). *Understanding human behavior and the social environment. (S. Dobrin, A. Petty, A. McLaughlin, Eds.).* Linda Schreiber-Ganster, Brooks/Cole CENGAGE Learning. ISBN-13: 978-1-133-3144-0

Appendix A

Town of Oro Valley Annexation History

A map of the annexation history of the Town of Oro Valley, Arizona is depicted below (Town of Oro Valley, 2020). The town's boundaries expanded multiple times from 1974 to 2013. The original corporation area is shaded in dark green towards the bottom of the map. The other shaded areas indicate specific areas that were annexed by year.



Appendix B

City of Denton Maps

This section contains maps of the City of Denton pertaining to city boundaries, ETJ areas, land use, zoning, annexation history, and water quality sampling locations. High-quality, full-sized maps can be viewed and downloaded for free on the City of Denton website (City of Denton, 2021).

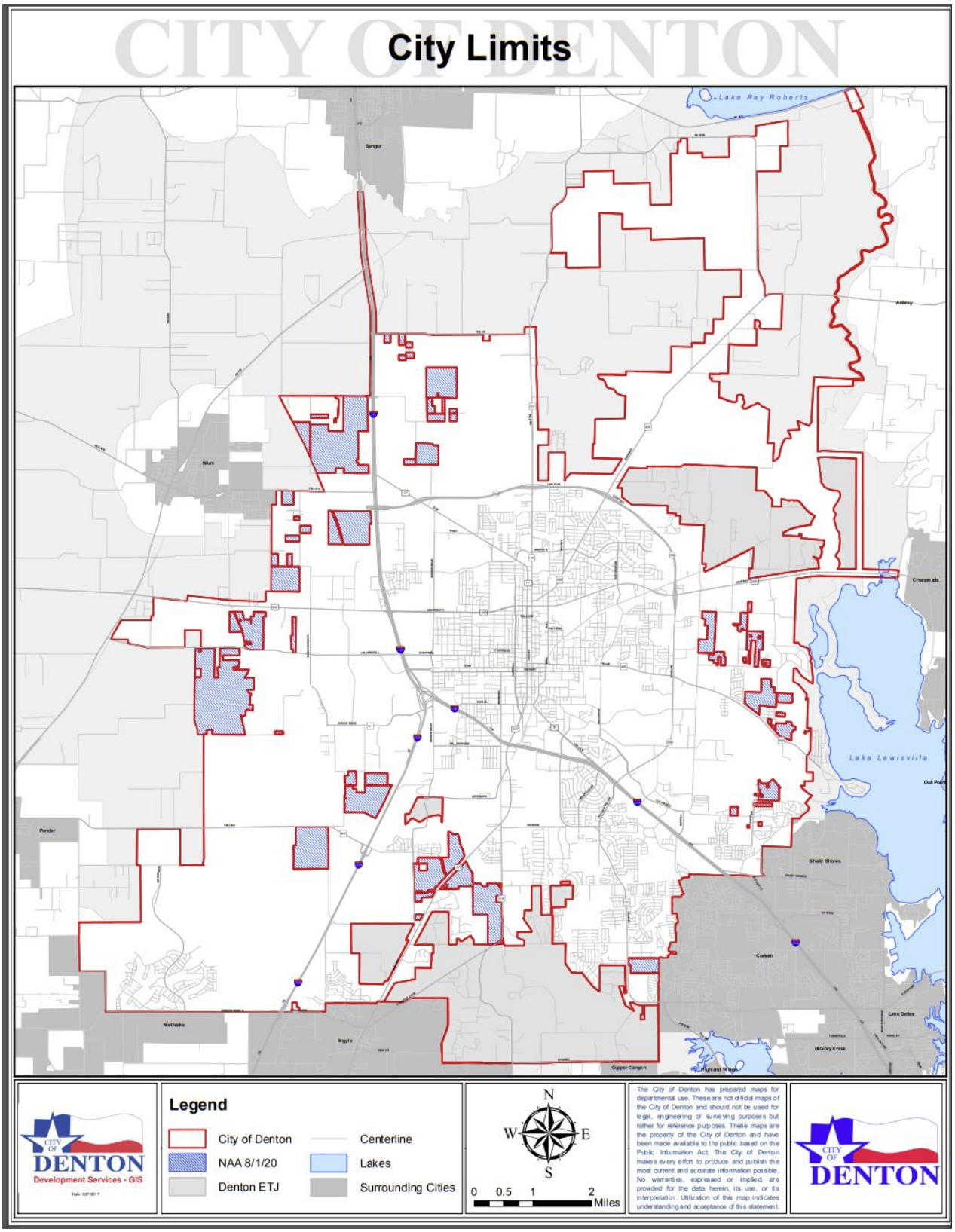


Figure B.1. The current city limits of the City of Denton.

City of Denton
City Limits & ETJ Map

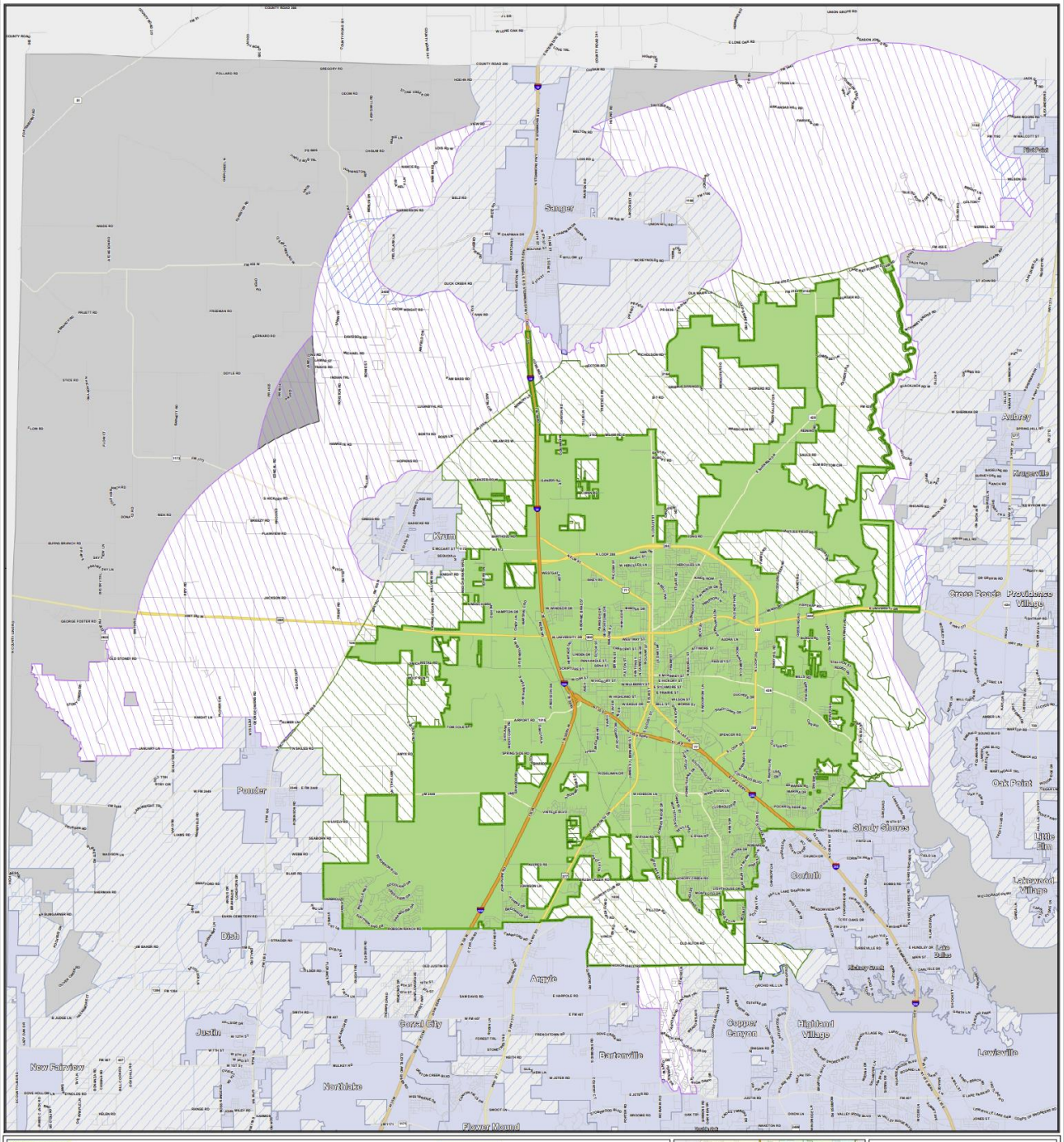


Figure B.2. The current city limits of the City of Denton and its allotted ETJ areas. This illustrates the complexity and disorganized land patterns associated with annexation, including the leapfrog effect. There are several locations where there is a main city border, an ETJ pocket area, then a resumption of the city border.

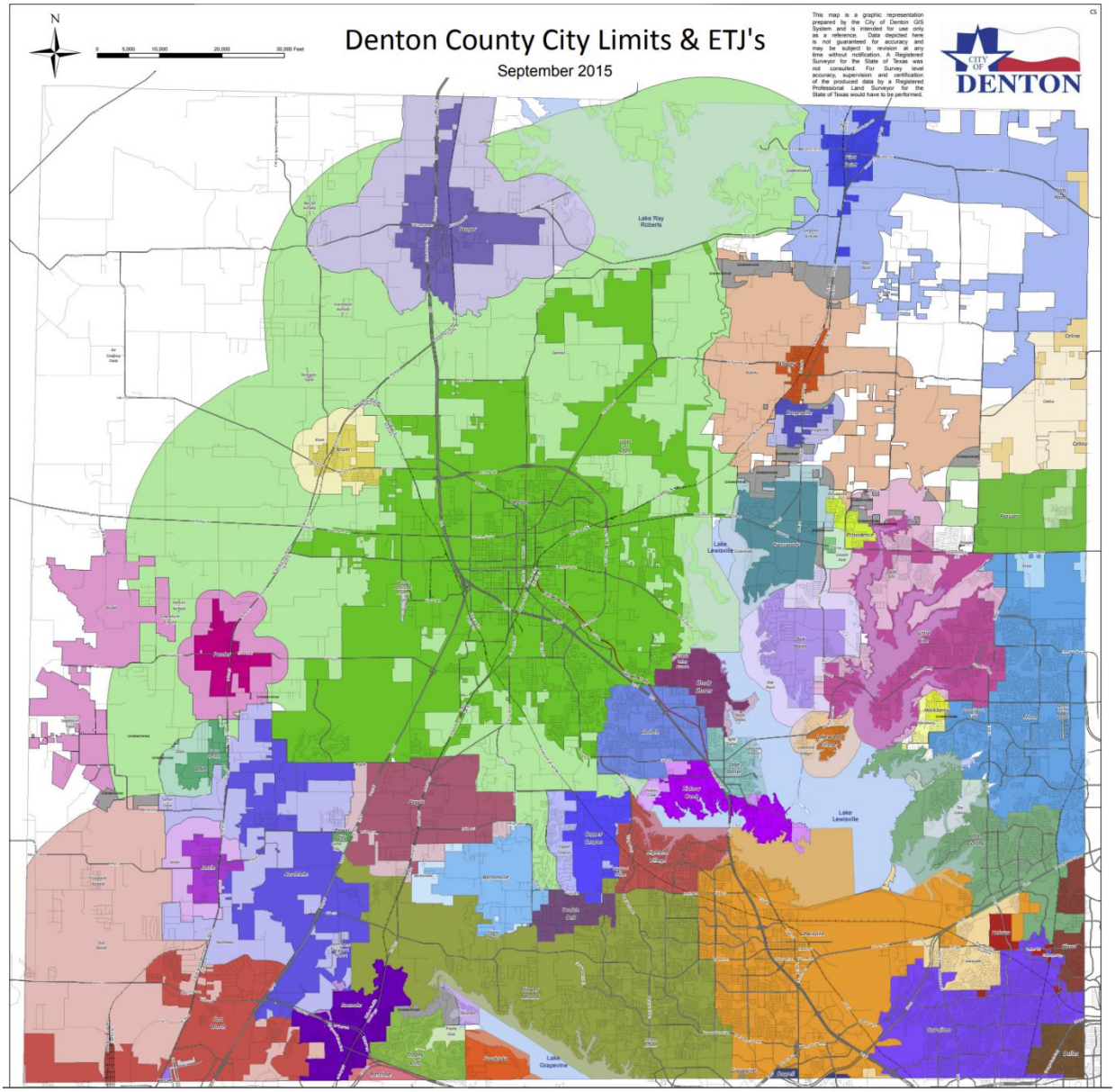


Figure B.3. Denton County City Limits & ETJ's.

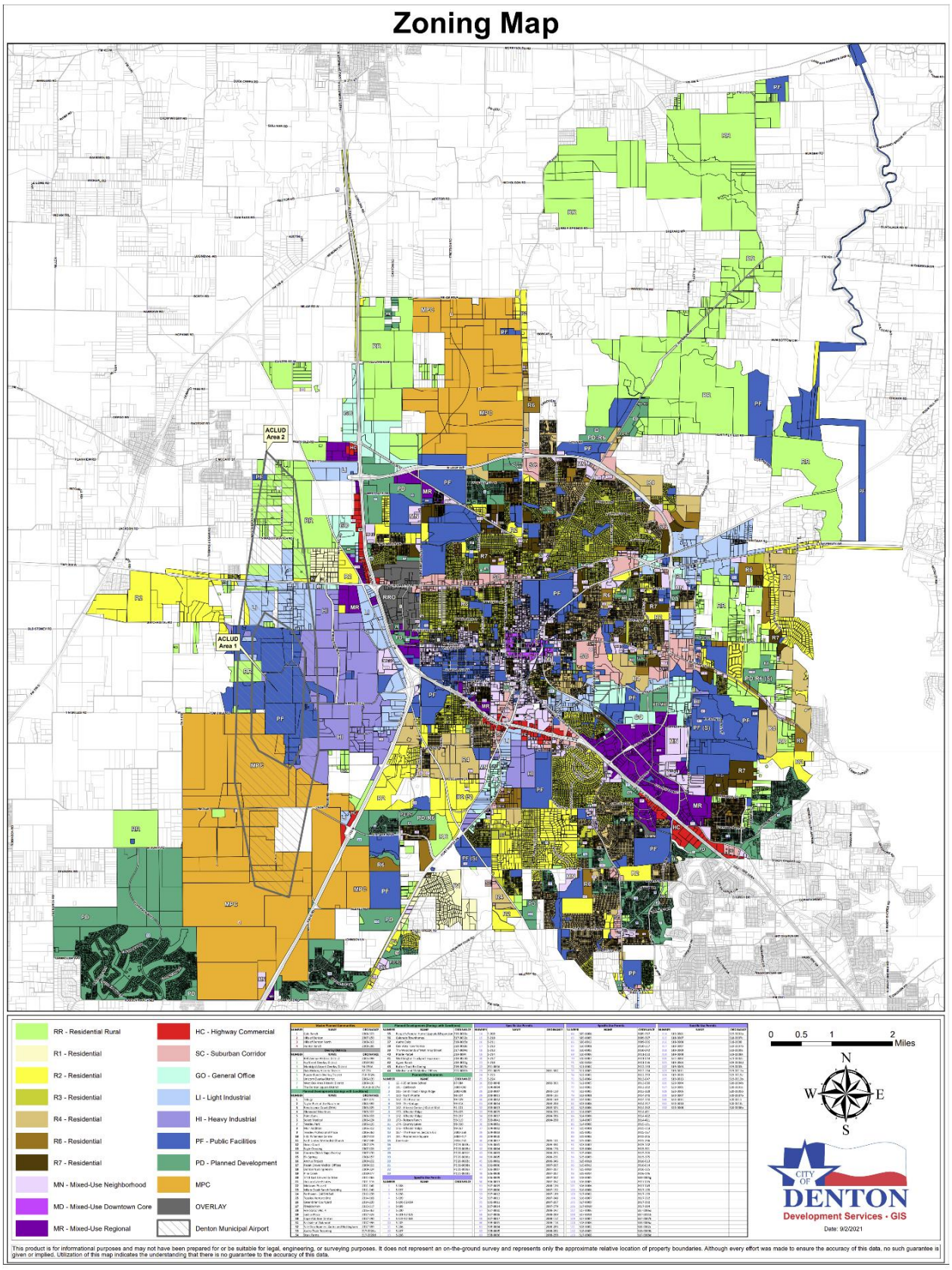


Figure B.4. City of Denton Zoning Map indicating details regarding each zoning district.

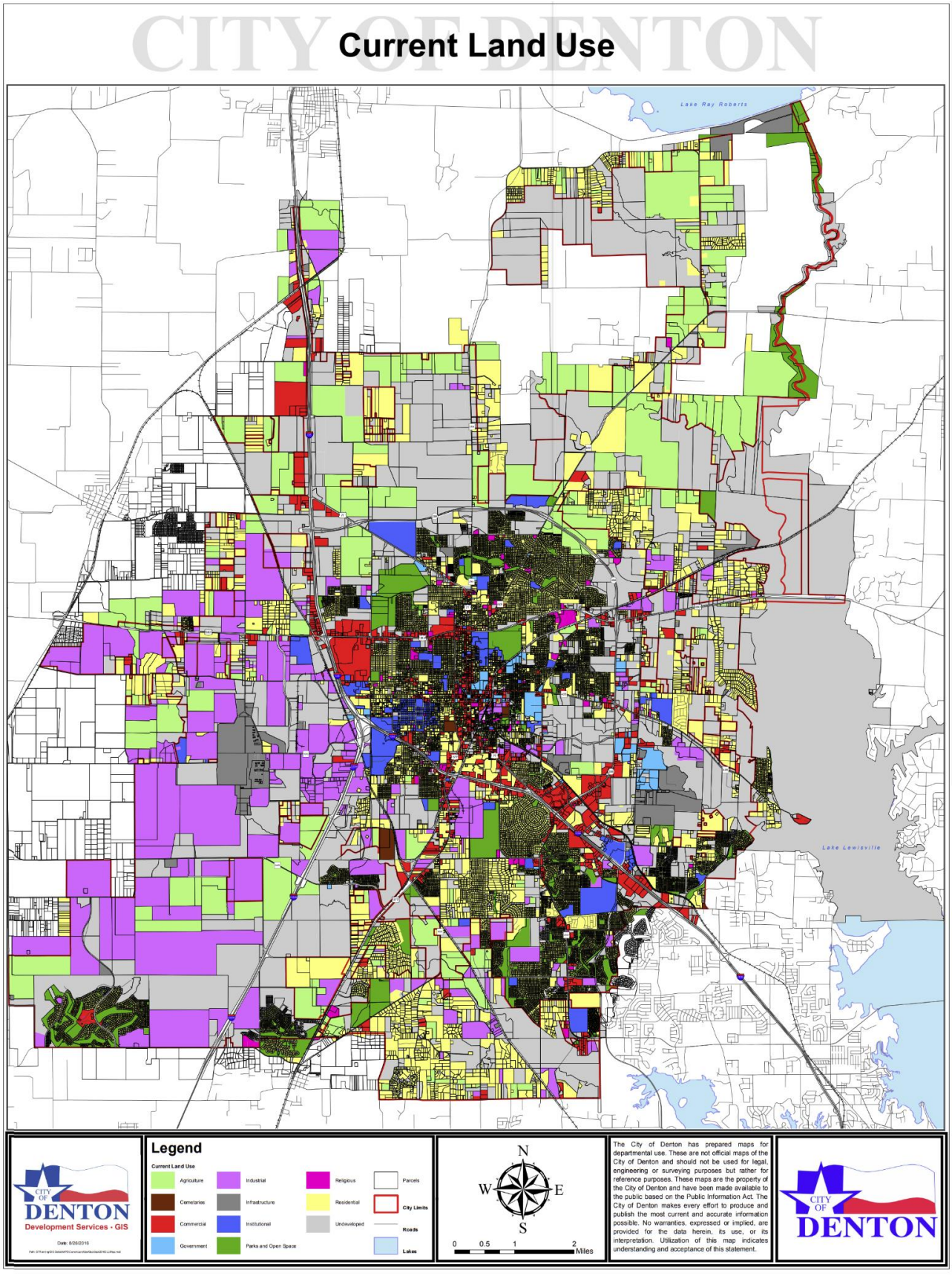


Figure B.5. Current Land Use Map of the City of Denton.

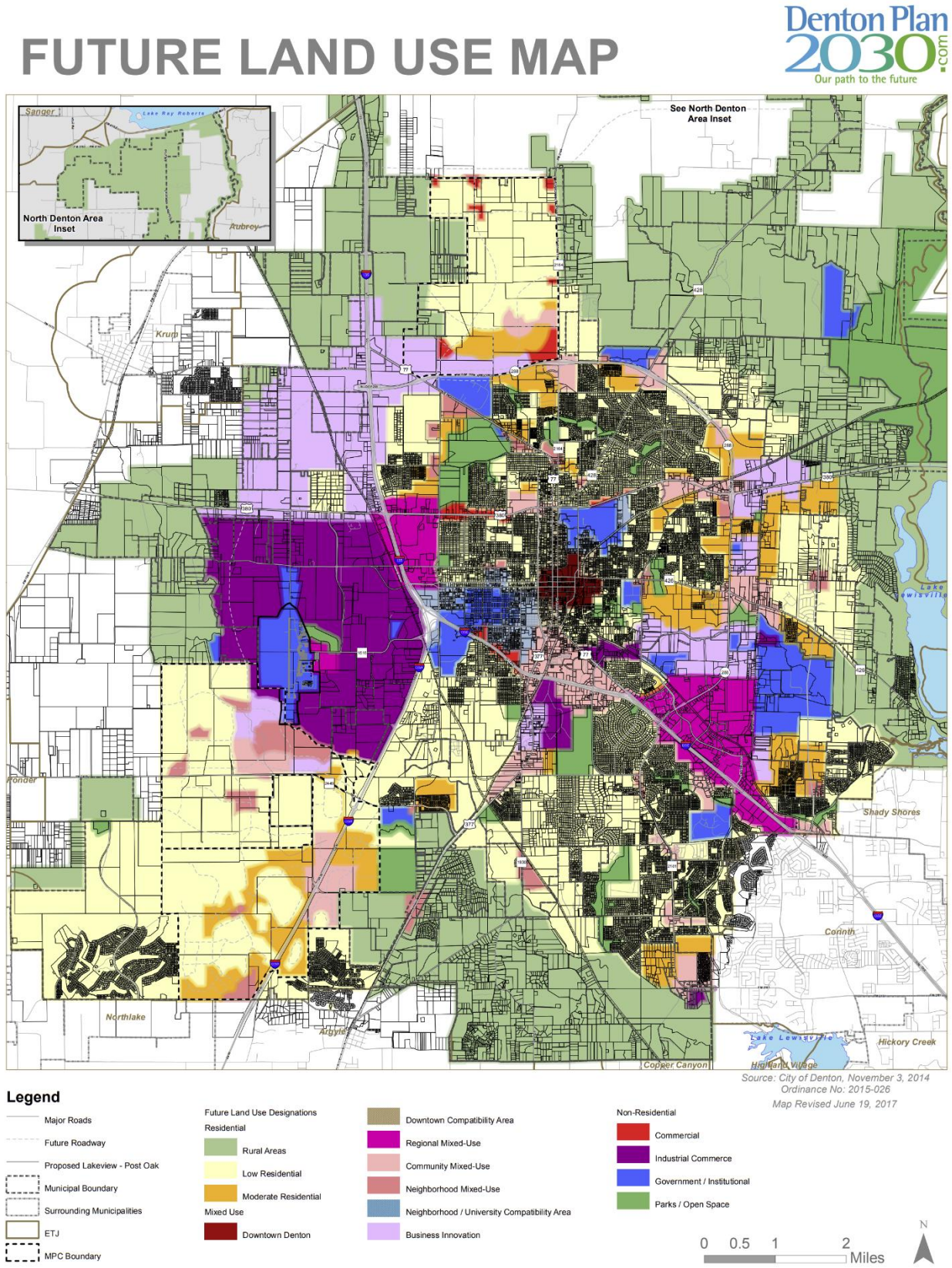


Figure B.6. City of Denton Future Land Use Map according to the 2030 Strategic Plan.

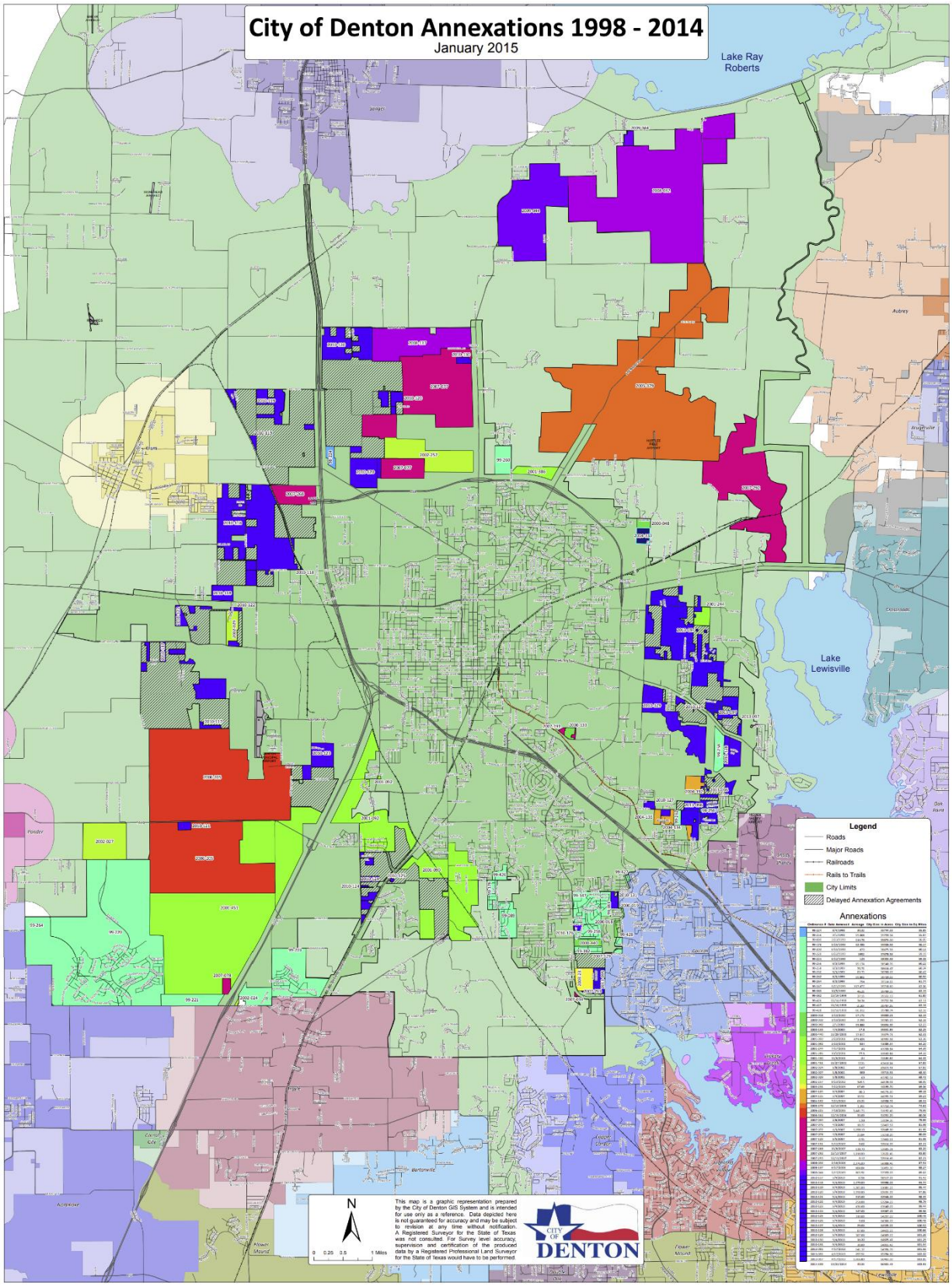


Figure B.7. A map of the areas most recently annexed by the City of Denton.

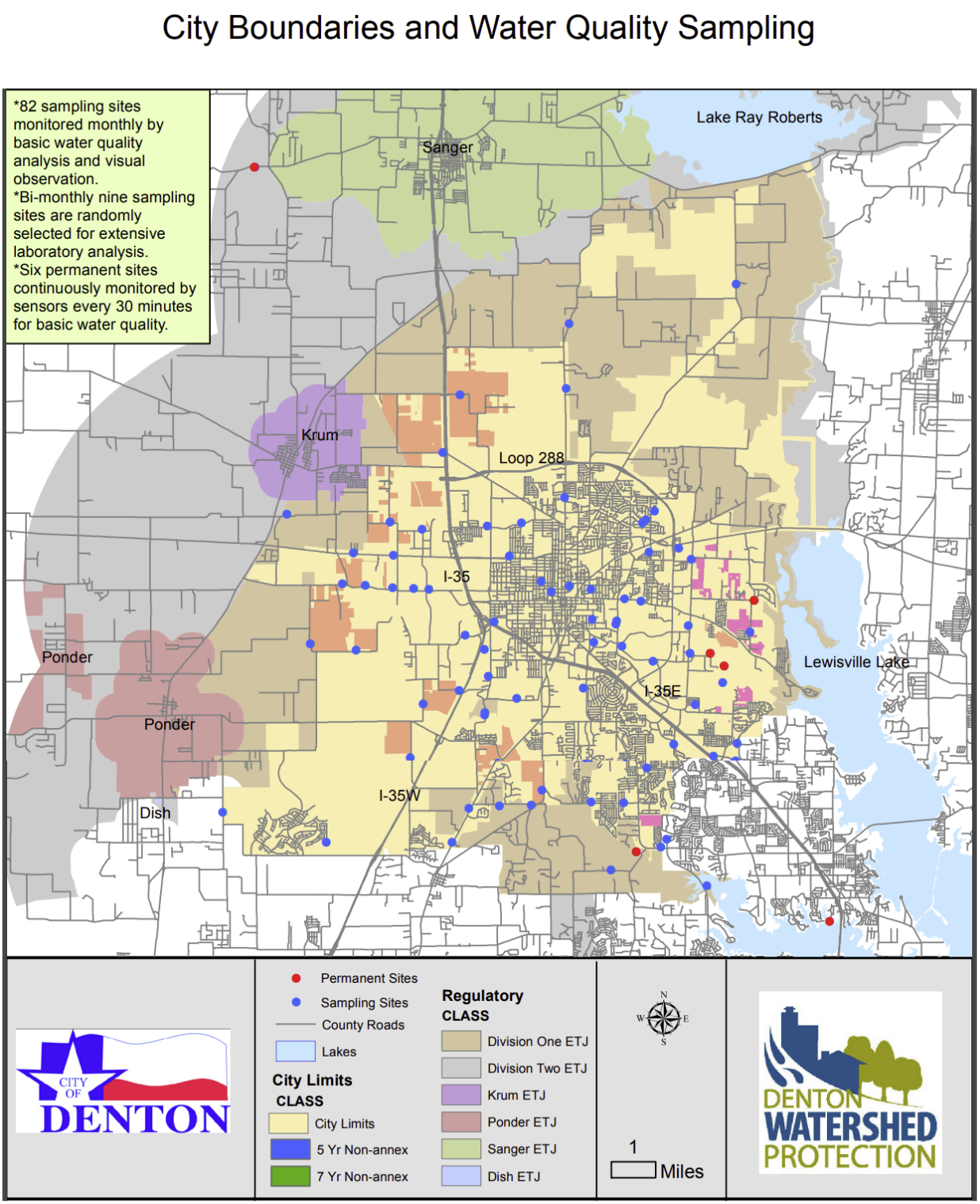


Figure B.8. A map indicating the locations and frequencies of water quality testing conducted within the City of Denton area

Appendix C

Contaminated Tap Water at Green Tree Estates

The photograph below shows the yellow, contaminated tap water at Green Tree Estates (Perez, 2019).

Appendix D

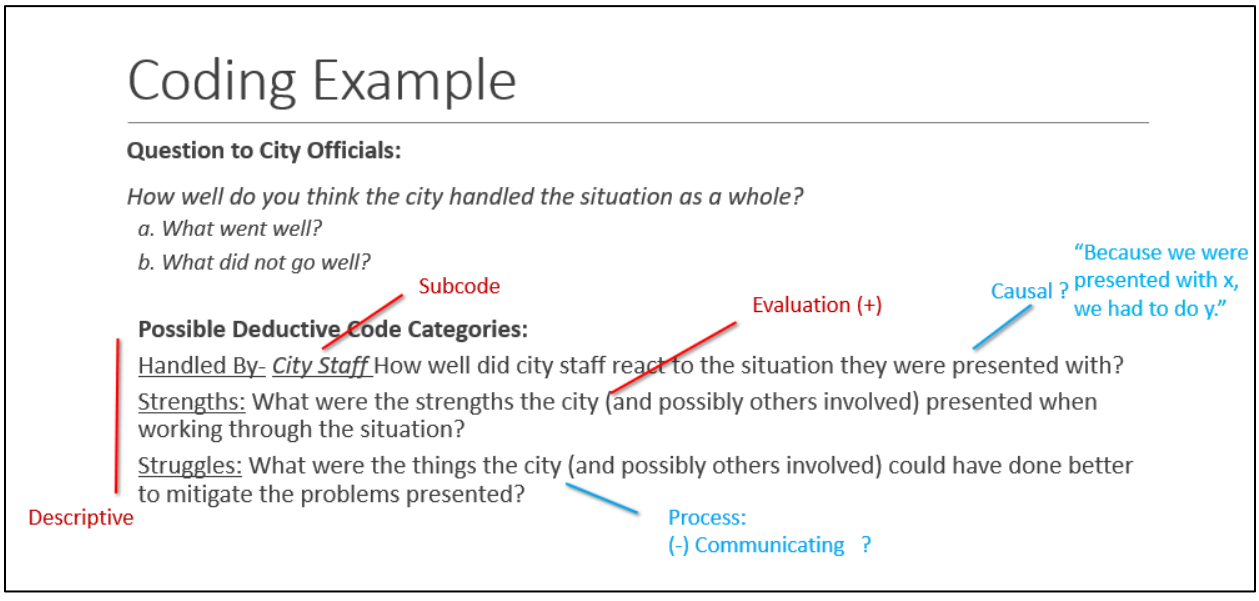
Water Containers at Green Tree Estates

The photograph below shows two of the water containers that were temporarily used at Green Tree Estates as part of the emergency order (Heinkel-Wolfe & Perez, 2020).

Appendix E

Coding Example

The following is a visual example of how the coding process may apply to specific questions asked to participants. All three primary codes shown are deductive and descriptive codes which explore themes related to how participants viewed the handling of the situation and corresponding strengths and struggles they faced when working through the situation. Deductive codes are indicated by red, and possible inductive codes are indicated by blue and a question mark. It is important to note that these are just examples to illustrate how part of the coding process may be undertaken. The codes shown here may not be exhaustive or accurate, especially regarding the hypothetical inductive codes listed.



Appendix F

Codes Used

The chart below details key words and phrases said or implied by at least one participant during the interviews. The purpose of this table is to highlight themes and discussion points that seemed important to the participants or that helped answer the initial research questions. The left column lists direct quotes as indicated by quotation marks, and in some cases a phrase that was slightly re-worded for clarity and conciseness. The right column details the context that the word or phrase was mentioned in. For example, more than one participant said the phrase, "routine annexation," and its corresponding box in the right column details what the participants said their definition of "routine annexation" was, or what they meant when they said the phrase. In another example, more than one participant indicated that there was an *Underlying Tone of Racism,* but did not say that phrase verbatim. Its corresponding box in the right column gives details, including direct quotes from the participants, about what the participants said and meant in relation to the stated phrase.

The primary in vivo codes were trust, communication, responsibility, legal/moral/ethical obligations, ability, and expectations.

Key Words, Phrases, and Related Contexts Stated By One Or More Participants	
Key Words/Phrases	**Related Contexts**
"Routine Annexation"	The annexation process was straightforward, followed state laws, and no notable complications occurred during the process
"Offense"	Residents and advocates were offended by some of the comments made by city officials regarding the state of their neighborhood and suggested solutions to the water crisis
Underlying Tone Of Racism	Some councilmembers "made many comments that were ugly and unappreciated. Even if the comments were not intentionally racist and offensive, it's the effects that matter." The Council held really damaging and "dehumanizing" stereotypes of the people who lived there. City officials who were making decisions about the community didn't even visit the neighborhood.
"Civil Rights"	This is a civil rights issue because it involves a racial minority group needing access to basic human rights
Nonprofit's Ability To Help	Some nonprofit organizations offered help, but were not actually able to provide the type or extent of help needed.
"Why Make It So Hard "	City has infrastructure standards higher than the municipal legal codes, which would have been hard for residents to afford.
"Should Have Done More"	The City should have done much more to help the residents with getting water hookups, street repairs, and trash pick-up
"Hyper Advocacy"	Advocacy was very much needed, but some advocates were going about it in a harmful way that was detrimental to communications between the City and residents of Green Tree Estates.
"Advocacy"	Residents were empowered by community activists to advocate for themselves. The advocacy efforts by the residents cannot be overstated. They communicated directly with city officials and media outlets, bringing forth their needs and own potential solutions.
"Frustrating"	Community advocates and residents felt the most frustration because they felt they were not being listened to, and kept facing bureaucratic hurdles.
"Equity"	Everyone in the city must have access to excellent, clean potable water

Key Words, Phrases, and Related Contexts Stated By One Or More Participants	
“Fair Housing”	This was a fair housing issue because the residents were a protected class. There was the underlying threat that residents could be kicked out of their homes, and the minority neighborhood was not receiving equal services compared to other neighborhoods in the city.
“Taxation Without Representation”	Those living in Green Tree Estates were paying city taxes but did not have the same services enjoyed by other city residents.
“Expectations”	It was challenging to maintain reasonable expectations of what the City could provide or do. Residents and advocates expected more than the City was able to provide.
“Ability”/”Allowed To Do”	What was the City of Denton legally allowed to do? Most people in general don't understand that cities don't have as much power as residents think. City officials did everything the City reasonably and legally could do, and did it pretty quickly. They "did everything in [their] power" to mitigate the situation in the short-, medium-, and long-term. Short term actions included getting the water out there to address immediate needs, and allow the residents to occupy their homes as long as they chose to do so. Mid-term actions included placing the water meter bank. Long-term actions were to continue to work the residents as they come in to help them know what they need to do, and identify what their best path forward is.

Key Words, Phrases, and Related Contexts Stated By One Or More Participants	
“Legal Complexity”	There were legal stipulations of what the City was allowed and not allowed to do. It took willingness and creativity to get around many of the legal hurdles. Determining who owned which parts of the land was a big issue, along with determining who was responsible for enforcing water quality. The City faced solving the problem and getting the residents what the needed without breaking state laws regarding private versus public property. Because city dollars primarily come from local taxpayers, costs of addressing the issues at Green Tree Estates were borne by the entire city. City officials had to figure out what they were legally able to do to both address the needs and not create an undue burden on, and taking advantage of, everyone else paying into the system. "Balancing interests" was also important because lots of people would love to have a water line instead of a well. The City had to ask themselves how they could address the issue without creating a potentially problematic precedent. It would have been unwise for the City to possibly set precedents for the City to help maintain people's property who do not actually need the assistance to maintain healthy and safe environments.
“Decision Point”	How much could the City provide without crossing legal boundaries where it would be considered an "illegal gift?"
“Legal Obligation”	What legal obligations did the City have?
“Ethical Obligations” and “Moral Obligations”	What ethical and moral obligations did the City have?
“Trust”	The City recognized that Green Tree residents did not trust the City, which made it hard for city officials to collaborate with them to find a solution. Establishing trust between the different parties involved is key in working through these types of situations.
“Just Stick With It”	The government was challenged because officials knew there was a crisis that needed to be addressed but had to have the correct legal documents to proceed, was challenged with fiscal responsibility, and was bound by other laws and procedures.
“Unpleasant Situation To Be In”	Officials knew there was a pressing problem but faced hurdles to be able to solve it.

Key Words, Phrases, and Related Contexts Stated By One Or More Participants	
"Creativity"	These tough situations are where the greatest level of creativity is needed because you can't just tell people, *sorry, good luck.* You're going to find a solution somehow.
"Right Not The Obligation"	In the annexation agreement, the well owner had the right to tie the well to city water with air gaps in the well system.
"Communication"	Language barriers made "practical communication" hard for city officials and residents to know what the others were saying. Communication also entailed how information and ideas were shared with residents and between city officials themselves. This also includes communicating what the City was able and willing to do, and the Council not presenting as a united front and "speaking as one voice."
"Responsibility"	Determining who was responsible for addressing certain issues was challenging. Who was responsible for the current situation? How much responsibility falls to the City, residents, TCEQ, and other parties? Because mMoney falls where responsibility lies," it was hard to fully determine responsible parties because that is probably where the money to fix the situation will have to come from.

Appendix G

Checklist for Social Workers

If social worker does decide to offer assistance…

1. Connect with a gatekeeper

2. Work with the individual or a small group to establish a trusting relationship with residents

    - Includes verifying community needs, and if the social worker's presence is wanted
    - Let gatekeeper know what types of help the social worker can provide

3. If proceeding, work directly with residents to explore possible options

4. Empower residents to advocate for themselves

    - Consider helping residents to form a committee

5. Help locate mental health care for both children and adult residents

6. After residents gather information about the complexity of their situation, social worker can help them develop an action plan

7. Once primary entity is identified, work as collaboratively as possible

    - Have a committee member act as liaison between community and city
    - Prepare to hear and discuss different viewpoint of other parties
    - Take time to establish trust
    - Eliminate communication barriers early on
    - Speak in ways to allow all parties feel respected
    - Brace for tackling a highly complex problem
    - If blame is to be had, focus should be placed on solving the problem, while still being as fair as possible with identifying any responsible parties and holding them accountable

8. Social worker can help identify and secure resources to help implement solutions, make suggestions to the neighborhood committee regarding media content, assist with any other needed advocacy efforts

9. Social worker can help provide encouragement, empowerment, and other appropriate forms of support to the neighborhood residents throughout the process

Appendix H

Understanding Why Green Tree Estates Lacked Access to Clean Water
Instrument Title: Key Informant Demographic Form

UIN: _____ Date: _____

1. What type of organization do you work or volunteer for?
    a. Non-profit Organization
    b. For-profit Organization
    c. Government Entity
    d. Other (please specify): _____

2. What is your role within the organization?
    a. Entry level position
    b. Mid-level position
    c. Senior level/manager
    d. Other (please specify): _____

3. What is the primary function of your role within the organization?
    a. Community Relations
    b. Strategic Planning/Development
    c. Executive
    d. Advocacy
    e. Other: _____

4. What is your gender?

    _____

5. What is your age range?
    a. 18-24
    b. 24-35
    c. 36-50
    d. 51-64
    e. 65 and up

6. Highest Education Level:
    a. Less than high school graduate or equivalent
    b. High school graduate or equivalent
    c. Some college or technical school
    d. College degree
    e. Master's degree
    f. Doctorate degree

7. How do you identify? (Select all that apply):
    a. Black/African American
    b. White/Caucasian
    c. Hispanic/Latino
    d. Asian/Asian-American/Pacific Islander
    e. Other (*Please specify):* _____