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The Great Stink in the 21st century? Problematizing the sewage scandal in England and envisioning a new infrastructure ideal

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ABSTRACT. The Great Stink of 1858 saw politicians in the Houses of Parliament commission a new sewer system for London at an unprecedented scale and cost. Political consensus was driven by the stench emanating from the river Thames, filled with faeces. Today, England is experiencing parallels to the first Great Stink, with untreated sewage discharging into the country's watercourses for a total duration of 3.6 million hours in 2024. The scale of sewer discharges has heightened tensions between the public and the water industry, with activists leading civic action that includes social media campaigns, bill boycotts, and street protests. We carried out an ethnographic study in the Yorkshire region with the aim of analyzing and exploring emerging tensions between stakeholders. We found that the root causes of the sewage problem were deeply contested, creating an uneven foundation for sanitary reform. Stakeholder groups understood the sewage crisis differently and were often found to be calling for competing solutions. To theorize these divergent problematizations, we draw from sanitation imaginaries literature that considers collective assumptions about waste infrastructures. Sanitary developments in England have long aspired to the modern sanitation ideal, seeking to discretely remove household waste waters, transporting and treating elsewhere, eliminating public health risk alongside minimal environmental impact. The contemporary sanitation crisis, or "Great Stink of the 21st century," has shattered this modern infrastructure ideal and social imaginary, causing rifts between stakeholders about how and what progress can be made. Overall, historical parallels serve to remind that political consensus and a shared vision among stakeholders are necessary conditions for sanitary revolution in England.

Key Words: *environmental health; ethnographic methods; public health; social imaginaries; water governance*

INTRODUCTION

In recent decades, the matter of sanitation has been rendered invisible and conceived as uniform in England, in line with the modern infrastructure ideal. Yet the 2020 sewage scandal re-positioned sanitation as visible and revealed systemic ruptures across the network. Sewers are a form of faecal waste management, a service that can be delivered through an array of options and configurations, all with the primary purpose of ensuring environmental conditions favorable to public health (WHO 2018). Although sanitation terminology is not commonly used in England, we apply it in this research to recenter the primary purpose of sewers and to examine ingrained assumptions (or social imaginaries) around waste management.

Most households in England have been connected to sewer networks since the mid-20th century (Hassan 1985). Although the common notion today is that all people are connected to these networks, there are notable exceptions. Certain populations remain unconnected and must employ alternative sanitation practices, including marginal social groups such as Roma and Traveller communities (Eminson 2024), boat dwellers (Sylvester and Underhill 2024), and people experiencing homelessness (Meehan et al. 2023). Despite these important minorities, this research is focused on the dominant narrative in England, premised on the ideal of modern, sewered service delivery.

The late-19th century saw sweeping developments in clean water and sanitation provision, necessitated by populations and industry clustering around urban centers, producing intensely unsanitary environments (Abellán 2017). The Great Stink of 1858 recalls a summer when the river Thames became so putrid that politicians in the new Houses of Parliament, built on its banks, were driven to commission a sewer system for London at an unprecedented scale and cost (Halliday 2001). The chief engineer for the project, Joesph Bazalgette, is attributed with the skill and foresight that saved more lives than any public official of that era (Doxat 1977, Cook 2001). This is the most poignant example of sanitary reform in England, sparked by the proximity of those with power to a river of faeces, and a visionary engineer empowered with authority and financial resources.

Sharing some parallels to the first Great Stink, in 2024 untreated sewage was discharged into England's watercourses 450,398 times for a total duration of over 3.6 million hours (The Rivers Trust 2025). Whereas in the 19th century the construction of combined sewer networks enabled a revolutionary step change in sanitary conditions, in the 21st century this infrastructural design is channeling high volumes of sewage into the environment. Combined sewer overflows (CSOs) are system components that allow sewers to release excess untreated wastewater, designed only to operate under heavy rainfall events. However, new data show that, in many locations, this occurs during business as usual.

Annual sewage spill data have been collected since 2016, via Event Duration Monitors (EDM) fitted onto CSOs, detecting changing wastewater levels and indicating sewage spills. In 2019 and 2020, EDMs were rolled out widely across the country, building national datasets that represent the scale of the issue. The Environment Act 2021 cemented the trends in open reporting, obliging water companies to publish their sewage data, moving away from the practice of private self-reporting (EA 2025). In the same year, results from a full assessment of England's rivers were published, revealing that only 16% of surface water bodies were classified as in "good" ecological status, according to the Water Framework Directive Regulations (DEFRA 2025). Coinciding with the Covid-19 pandemic, lockdowns, and increased attention on the local environment, this time marks the beginning of the national "sewage scandal."

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Since 2020, avid campaigners have mobilized, demanding rapid improvements to sewerage infrastructures and river health, making use of consumer power (bill boycotts; We Own It 2024), street protests (Gayle 2024), publicly available data (Sewage Map 2024), social media influencing (Save Windermere Campaign 2024), and leverage points in otherwise impenetrable water industry governance structures (discussed further in the "Competing geographies" section; Bullough 2022). Customer trust is at an all-time low (Consumer Council for Water 2024), political economists express the failures of privatizing water (Buse and Bayliss 2022), and seminal public health scholars ask: what will it take for a new sanitary revolution in the U.K. (Middleton and Saunders 2024)? Despite swathes of public attention (Usher 2023), progress toward sanitary reform is disjointed, riddled with contestation about what the real problem is and how it should be solved.

We apply an ethnographic lens to this new iteration of the Great Stink, exploring these contestations and divisions between sanitation stakeholders (including those with an interest and role in sewer infrastructure, river management, and wider governance) ostensibly working toward the same goal. Drawing from critical geography and political ecology literature (McFarlane 2008, Lawhon et al. 2022), we attribute conflicting stakeholder narratives to distinct, high-level sanitation paradigms (or imaginaries), informing different formulations of the problem at hand. We find that two fundamental components of sustained, equitable sanitary reform are currently missing: clear political support and consensus on the future sanitation vision for England.

THEORETICAL BASIS: ENVISIONING ENGLAND'S SANITATION FUTURE

A defining feature of the first Great Stink was a strong aspiration for the future sanitary revolution: the efficient management and re-distribution of faecal waste away from populated areas. The "remote dumping of sewage and waste" is central to the contemporary urban process. Graham and Marvin's (2001) seminal work on the modern infrastructure ideal argues that urban infrastructures are increasingly fragmented and politicized, often working to re-produce socioeconomic inequities in cities. Whereas the social imaginary of modern infrastructure is discrete, efficient, and universal, Graham and Marvin (2001) refute this through the lens of uneven and competing geographies.

Analysis of the modern infrastructure ideal has been applied to specific sectors, such as Linton's (2010) foundational text on modern water. In this research, we focus on the sanitation sector, examining how the modern sanitation ideal has become ingrained in England and a widely accepted social imaginary. However, the sewage scandal has ruptured this acceptance, based on widespread revelation of the uneven distribution of waste and its implications.

Sanitation imaginaries

We trace this sector-specific literature on the modern infrastructure ideal to McFarlane (2008) writing on the spatial imaginaries and logics of sanitation infrastructures in Bombay. He argues that ideologies of the "contaminated city" in the colonial period, and the "world city" in the postcolonial era, have shaped how sanitation has been implemented. The world city concept has connotations of being orderly, clean, and akin to other idealized cities in rich countries (McFarlane 2008). Similarly in Jakarta, Putri (2019) writes that geometric, urban layouts have been created in the image of western cities, re-producing belief in this type of logic.

Building on McFarlane's work, Morales et al. (2014) are the first to explicitly use the phrase "sanitation imaginaries," defining it simply as the expectations people have for their sanitation. Participants in their study, from a marginal neighborhood in Buenos Aires, expressed beliefs around sanitation in a modern city. These included the expectations of state responsibility, and the absence of physical or mental engagement with excreta, which were seen as signifying "underdeveloped and backward lifestyles." Further, the privacy associated with domestic sewerage was considered a marker of modern, urban citizenship (Morales et al. 2014).

Adjacent literatures have also extended the concept of sanitation imaginaries. Jensen and Morita (2017) explore the ontologies of waste infrastructures using anthropological methods, finding that infrastructures are both created by and create "practical ontologies." Sanitation infrastructures have the unique character of many secret, shameful, private, hidden, and unseen dimensions of modern society. As well as analyzing the spatial distribution of wastes in a city, anthropological insights help realize the potential for re-shaping social relations by looking at what happens in these spaces of visible waste (Jensen and Morita 2017, Alexander and O'Hare 2020).

Most recently, Lawhon et al. (2022) offer a new type of sanitation imaginary as an alternative to the modern ideal. From their work in Kampala, they find that the promise of modernity, though still appealing, is waning. They propose modesty as an imaginary that rejects the hierarchy of modernity and "does not accept inadequate sanitation for some: it is founded (instead) on a vision of an interconnected city with shared interests" (Lawhon et al. 2022:161). A modest approach is relational, aware of the multi-scalar impacts of sanitation on the environment and wider society.

Related scholarship exists in the Global North, with Silver (2019) extending relational theorization of urban inequality through decaying infrastructures in New Jersey. Meehan et al. (2020) disrupt common myths about modern water Global North contexts, and Picon (2018) examines how networked infrastructures are dependent on social imaginaries, through a case study of Haussmann's renovation of Paris and the contemporary smart city perspective. England is one context that has, for decades, seemingly embodied the modern sanitation ideal, appearing to uniformly deliver sewered services to everyone at a similar quality and cost, under a highly neoliberal governance model (Lawhon et al. 2017). Yet, this appearance is waning and public belief in it is fracturing, in parallel to the visible degradation of sewer systems.

Problematizing sanitation

Attached to the absence of a clear sanitation vision is a lack of stakeholder consensus on what the real problem is. Bacchi and Goodwin's (2016) problematization theory supports our analysis of contested understandings of the sanitation crisis. The term problematization represents how an issue is conceptualized and configured as a problem within social groups (Stengers 2019).

Problematizing sanitation or wastewater management has shown to be used strategically to maintain political narratives and hide, disguise, or re-frame others (Weder 2022).

In Sweden, Holmberg and Ideland (2022) find that wastewater management has been made into a public secret, upheld through a deliberate balancing act of visibility and invisibility. The problems associated with sanitation, such as leaks or sewer malfunctions, are presented to the public by water industry and political leaders as normal and treatable with the correct response and can be mitigated in the future by the correct behavior.

Müller and Kruse (2021) study how drought is configured as a problem in Germany. They show this happening in several ways, such as through the legitimizing of political framings using scientific language, and the increasing use of a national security framing. Similarly, Bourblanc (2013) examines water pollution from agriculture in Brittany, finding that the local social movement constructs problems and changes them strategically to support their goals. Bourblanc (2013) also employs the concept of "problem ownership" that expresses the interest organizations have in controlling the problem definition in order to legitimize their involvement in solution-making processes.

The literature on problematization and imaginaries demonstrates how deeply sanitation is intertwined with social behavior and ingrained, collective assumptions. These concepts underpin our investigation of the contemporary sanitation crisis, as we explore contested understandings of the root problem, and ask how we can move toward a consensus vision of a better sanitation future.

METHODOLOGY

Our methodological approach combines anthropological insights with a political ecology perspective of spatial inequities in our study region of Yorkshire. Although our findings are distinct to this region, they are also indicative of the broader situation in England.

Data collection and research context

We used the anthropological method of ethnography to gather data on experiences and beliefs around sewage and waste infrastructures. Ethnography requires extensive familiarization with the research context and interlocutors through observation, relationship building, and participation in local activities, as well as more formalized methods, such as semi-structured interviews. Our research was conducted over a period of 15 months, from September 2022 to December 2023. Ethical clearance was provided by the ethics committee at the University of Leeds, including a detailed data management plan and anonymity protocols.

We began by closely following the developments of an activist group based in Knaresborough, who were responding to sewage discharges in their local river. Data collection activities in and around the town of Knaresborough included: observations at stakeholder meetings and local events, informal conversations, field notes, and reflections from personal river encounters.

As the study progressed, we also established relationships with Ilkley, a nearby town in rural Yorkshire, and Bradford, a city of over 500,000 people (Figs. 1 and 2). These were developed by drawing on the researchers' networks, attending local events, and connecting to local people and places of interest through university staff residing in the areas. Through these activities it became more apparent that the sewage crisis in Knaresborough was intertwined with regional dynamics. We attended river events in both Ilkley and Bradford, as well as conducting informal conversations and carrying out formal interviews.

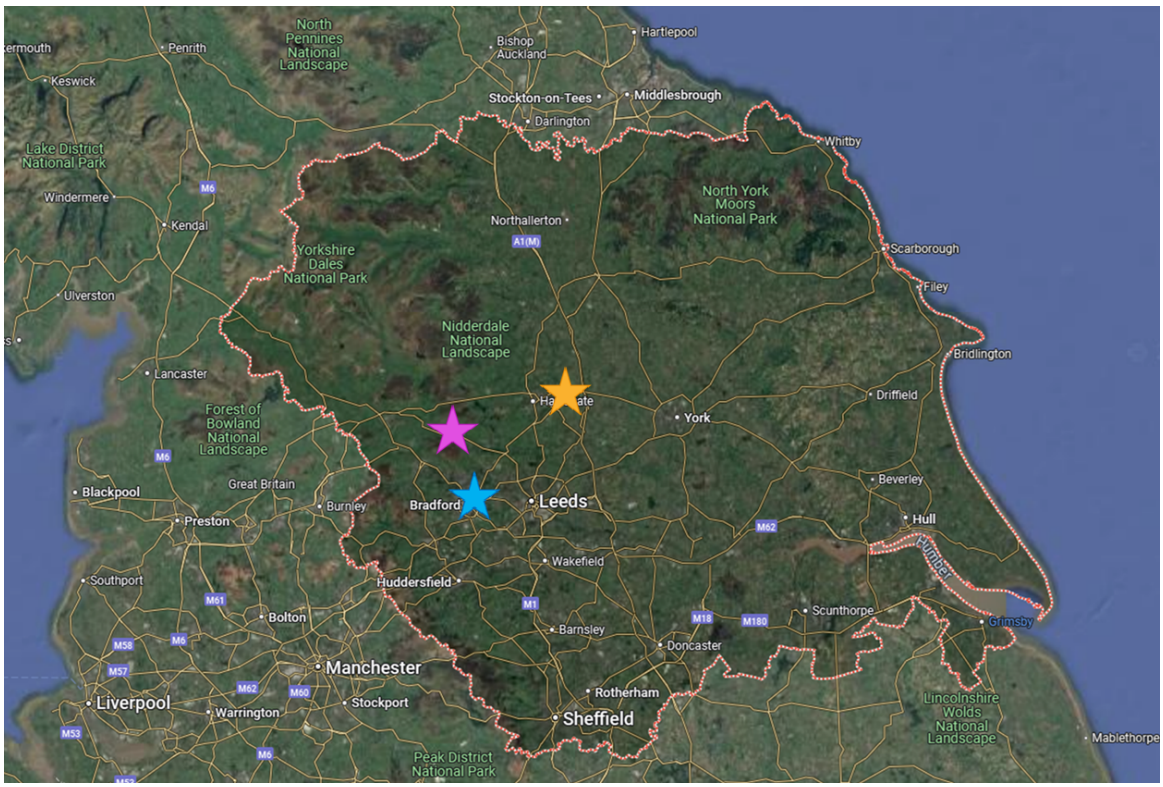
Fig. 1. The Yorkshire Region situated in a map of England (source: Google Maps).

The rivers running through the two rural towns of Knaresborough and Ilkley are the Nidd and the Wharfe, respectively. Although distinct, the rivers have many similar qualities, deriving from head springs in the Yorkshire Dales National Park, home to Wild Brown Trout and Grayling, and dramatically gushing through the Nidd Gorge and The Strid (Wharfe) as well as meandering through rolling farmland. The rivers wind through the heart of both towns, adding to their picturesque natures. In contrast, the rivers in Bradford (the Bradford beck [a colloquial name for a small river or brook in northern England] and the river Aire) are substantially modified and covered over, and receive heavy inputs from sewer discharges and household misconnections. It is also a much more multi-cultural place than the rural Yorkshire towns, with immigrants from Eastern Europe and West India and Asia having settled in the city to work in the booming textile industry in the mid-20th century.

Data analysis

Alongside ethnographic data, the first author carried out 16 in-depth, semi-structured interviews with a range of sanitation and river stakeholders associated with the three research locations.

Fig. 2. The Yorkshire region in detail, showing major cities. The research locations are shown in orange (Knaresborough), pink (Ilkley), and blue (Bradford). (Source: Google Maps.)



Interviewees included representatives from river activists, wild swimmers, the water industry, the environment sector, regulators, politicians, and academics. In this paper, interviews are cited by the number they were assigned by the first author.

Inductive thematic analysis was conducted on the qualitative data from interview transcripts and ethnography notes, documents, and articles. Braun and Clark (2006) establish a rigorous and theoretically flexible approach for qualitative thematic analysis. Informed by this, we chose to perform an inductive analysis to develop categories from the data itself (Fereday and Muir-Cochrane 2006). Bottom-up coding in this manner is never purely objective but rather related to the researcher's prior knowledge, and as such we include a section below on positionality (Nowell et al. 2017). Five core categories were identified, reflecting common themes, patterns, and stories in the data. These categories were designed to retain some holistic sentiment and context behind each piece of data, so larger chunks of text were often added to a category first, before distillation. The core categories and their sub-categories are set out in Table 1.

Once all relevant data had been attributed to a thematic category, each sub-category was reviewed and distilled to establish key findings. There was a large amount of data collected and analyzed, and in this paper we focus on only a portion of the data gathered on the contested nature of the problem between stakeholders (stakeholder perspectives and relationships) and the beliefs related to this (recurring stories and some data from valuing rivers). We also focus in this paper on the geographical differences across Yorkshire region, as we are writing a separate paper on the local dynamics of river activism in Knaresborough.

Researchers' positionality

Carrying out an ethnography requires self-reflexivity and an awareness of one's own position in relation to the interlocutors and the subject matter. This section demonstrates the authors' reflection on their different relationships to this research.

The three authors all live in Yorkshire, and as such have some degree of physical and social proximity to the research contexts and subject matter. The third author went to school in Knaresborough, grew up in a village close to the Nidd as it flows through the Vale of York, and has lived in the Aire Valley and swum in the Wharfe for the last twenty years. They bring a historical, situated perspective to the research. We recognize there is no one "community" or local relationship with these rivers; they are intertwined in multiple individual and collective dynamic relationships, which are continuously evolving.

The first and second authors have moved to the city of Leeds in recent years from areas in the south of England because of their research positions at the University of Leeds. Being audibly southern adds a layer of social difference to interactions with some local people in the research contexts, a layer that has connotations of the "north-south" divide in England. There was often another sense of difference when talking with water industry representatives, deriving from the culture of the industry and created by the use of jargon and assumed prior knowledge. Once it became apparent that this knowledge was also known to the researcher, interlocutors settled more easily into a sense of familiarity.

Table 1. Thematic categories used to analyze interview and ethnographic data.

Core categories	Description
Bathing water sites	Data added to this category pertained directly to the specific issue of bathing water sites, a legal status granted by central government that officially designates a water body as one in which people bathe. This comes with certain benefits, such as increased attention and water quality testing. It is the crux of many new activist strategies in England. Five sub-categories were attributed: application process; Ilkley group; national picture; regional equity; role of citizen science.
Recurring stories	Data added to this category expressed similarities between interlocutors' understanding of the problem of sewage discharges, and their beliefs about why it is happening. Two sub-categories were attributed: national stories; place-based stories.
Stakeholder perspectives	This category was for grouping common points of view on the problem of sewage discharges, found among certain stakeholders. Eleven sub-categories were included for all different stakeholders represented: academics; activists; agriculture; communities; government; media; politicians; regulators; rivers trusts; universities; water companies.
Stakeholder relationships (with one another)	This category was for grouping how different interlocutors reported feeling about other stakeholders, as many relationships were regularly discussed in interviews and ethnographic data. Four sub-categories were created for the ways in which these relationships were enacted and felt: beliefs about others' motivations; blame; direct interactions; expectations of others.
Valuing rivers	Data added to this category captured what is it interlocutors valued, appreciated, felt and noticed about rivers. Five sub-categories were attributed to distinguish the specific ways in which people valued rivers and why this was an emotive subject: collective experiences with rivers; how "should" things be; individual experiences with rivers; visibility of pollution; what is "wrong."

One dimension of our situated relationship to the research was a key entry point to the ethnography, through a member of the Knaresborough activist group, who also had links to the University of Leeds. Regarding their own positionality and place in this research, they wrote: "I went out of my way (a large amount of work and social capital) to make them (events and activities) happen. So, they didn't just happen at grassroots level. At Ilkley too, half the residents are University of Leeds academics, so there is a huge resource behind the 'grassroots' campaign - unlikely to be a feature elsewhere" (I7).

Overall, we reflect on multiple dimensions of positionality throughout the entire research process. The following section sets out our findings on different stakeholder views of the problem, what the causes are, and what the solutions could be.

RESULTS: DISJOINTED PROGRESS TOWARD SANITARY REFORM

The current sanitation problem in England is deeply contested, particularly between the most dominant stakeholders: activists, the water industry, and the environment sector. This creates uneven ground for progressing toward sanitary reform. Drawing from the problematization literature, we discuss how this problem is configured differently by stakeholder groups. We break down the broad problem of sanitation to focus on two key issues: sewer functionality and river health.

Problematizing sewer functionality and river health

In our study, most activists took the view that sewers were malfunctioning because of failures in sanitation infrastructure enabled by neglect, ignorance, over capacity, or deliberate action on the part of water companies. Additional blame was often attributed to failures of regulation, with one activist feeling that water companies are "a law unto themselves" because of a lack of river monitoring by the Environment Agency (EA), the environmental regulator for the water industry in England (I4). Another activist comment was aimed at Yorkshire Water and the economic regulator for the water industry, saying "[Y]ou've lied, and Ofwat let you get away with it" (I5).

Activists' problematization was commonly formulated around the passive failure of regulation and deliberate malice of water companies, who would rather pollute waterways than take a hit to shareholder profits. People in this stakeholder group arrive at this problematization from different water-related activities they enjoy participating in. For instance, wild swimmers value their physical connection to rivers, and in their activism they focus on human health impacts of polluted waters, often conflating this with wider river health. Anglers value their recreational time by the river, and are most concerned about fish stock and species. Although some activists do take a broader view than their predominant concern, many water industry and environment actors argue that holistic river health can only be measured by using multiple indicators.

Environment sector representatives expressed concern over the focus on human health within activist problematization, as they felt this diverted attention away from holistic river health. Some even felt this focus exemplified modern anthropocentrism in approaches to river management. One interviewee from an environment non-governmental organization (NGO) commented that there needs to be improved "understanding (about) what human health requirements are, in terms of water quality (in rivers), versus what ecological requirements are... what people (think) are important, that's what gets the attention. Sometimes it frustrates me because we should just care anyway" (I6).

Other environmental actors faced opposition from activists when they shared knowledge regarding different aspects of river health, including agricultural runoff, off-grid sanitation, and industrial inputs. Many recounted being accused of "getting into bed with water companies" when sharing this in multi-stakeholder meetings (I6; I15; observations). Environment sector representatives also held a view of past and present societal influence on rivers, discussing how heavily humans have modified rivers throughout history, and how crucial it is to understand how we see them today. One interviewee asked, "Do you view rivers as wild ... or do you view (them) more as an almost continuation of a farmed managed landscape? You are trying to look after it in the one sense but you're equally trying to use it as a resource, you know, and I think even in some legislation, there's conflict" (I10). Another asserted that "an immense amount of social change" is required to improve river health, because "people perceive their rivers to be what they think they're meant to be, [based on] how they've been brought up for generations" (I6).

In terms of sewer functionality, environmental actors often problematized this through the lens of legislation and regulatory capacity. A recurring issue discussed was that water companies were allowed to "mark their own homework" regarding water quality testing at wastewater treatment plants, as well as a lack of spot-checking from the EA (I6; I16). Water industry actors also referred to regulation as problematic, although not from the perspective of holding them to account, but rather from the perspective of incentivizing (or not) changes to practice. The idea that, for water companies, ignorance is better than knowing the extent of sewer discharges is attributed to failure in regulation. One academic interviewee who had prior experience in the water industry argued, "[T]heir [water companies] job is to deliver on their regulatory obligations, and if the regulator doesn't require them to know where that CSO is (then) that's fair enough" (I3). Combined sewer overflows (CSOs) are components of sewer systems that allow the contents to spill out when the sewer is over full capacity. Important to note is that combined sewers funnel rainwater into sewage pipes, and are very common throughout England, as they derive from Victorian-era sewer design.

The water industry broadly appeared to take issue with the activist narrative that sewers are malfunctioning, regularly asserting how CSOs are intentionally designed to spill during heavy rainfall to protect pipes backing-up in households, as well as attributing seemingly increasing discharges with new, climate-induced rainfall patterns (I14; I15; observations). Although these factors are a part of the story, other factors are not expressed by water industry representatives, such as real cases of overcapacity and underinvestment. Water industry representatives found generalized narratives like this frustrating because they hide the nuances and challenges they face, and yet they often followed the same approach, making generalizations about climate change or CSOs operating in an acceptable manner.

One water industry interviewee emphasized how CSOs, when functioning properly, should not have any adverse environmental impact: "[I]f you've got an overflow and it discharges into the Humber Estuary and it's a small volume, then the impact of that is gonna be absolutely negligible. And so you could have a huge overflow discharging into the estuary, but actually through modelling and through monitoring you can show that there is no harm" (I14). This argument was used to assert how the recent Storm Overflow Discharges Reduction Plan (DEFRA 2023) is unhelpful and ill-informed. The narrative has become part of water industry problematization about activist involvement, as many appear to feel that activists do not have adequate level of expertise to participate and do not recognize the work being done by the industry.

Many in the water industry believe this reduction plan has been too heavily influenced by activists and is not conducive to fair and equitable change within the industry, particularly between companies:

> *The other thing to remember as far as the companies is concerned is that that they are some of them in very different positions... United Utilities and Yorkshire (Water) have probably got nearly 2/3 of the entire CSOs in the sector... You have more separated systems in the South because you've had more new development. So you got more combined systems in the North because of, you know, old terraced housing.* (I1)

The plan was actively brought up in conversation by all interviewees from the water industry. The following sentiment was widely held: "[T]his latest episode is, in my experience, far and away the least well-informed response...that's what politicians do, isn't it? They respond (to) the narrative, rather than necessarily the technical evaluation" (I15).

This discussion of different problematizations demonstrates some of the deep disagreements between stakeholders over what the problem really is. Activists focus on recent water industry practices, environmental sector representatives center river health from a holistic and historic perspective, and water industry representatives attribute the problem to inherited sewer designs and climate change. Relationships between many stakeholders are fraught, and the struggles between them restrict progress toward an integrated vision for sanitary reform.

Competing geographies

The concept that, since the sewage scandal, places in Yorkshire are now competing for attention and funding was a cross-cutting finding across different stakeholder problematizations. Seminal theory sets out the hidden reality of uneven infrastructures re-producing socioeconomic inequities, a reality hidden by the imaginary of modern infrastructure that is conceived as universal (Graham and Marvin 2001).

A key argument from water industry representatives against activists taking a leading role in new regulations and political agendas is that it causes unequal distribution of funding within regions. This is because water companies in England are responsible for a given area of the country (a river basin area, closely related to geographical regions in England; for example, Yorkshire Water is broadly responsible for the Yorkshire region), and they finance infrastructure investments through billing customers in their area. The economic regulator, Ofwat, is mandated to ensure water companies provide efficient services at a fair price to customers. Ofwat permits a set rate of bills every five years and, as such, investments in a water and sanitation infrastructure are shared equally between all households in the area. Households are also unable to utilize standard consumer power by switching providers, so have very limited power to resist bill increases.

We found that the origin of this competition argument derives from the success of Ilkley activists in receiving additional testing attention and sewer investment by applying to DEFRA (the central government's Department for Environment, Food and Rural Affairs) to receive the first bathing water designation for an inland water body in England. This designation derives from European Union law and ensures additional water quality monitoring for places in which people are already bathing. An environment NGO representative called the Ilkley bathing water campaign an "absolute catalyst" for increasing attention on sewage from the environment and water sectors, emphasizing that "not everyone appreciates how much response and reaction the Environment Agency and Yorkshire Water had to do" after the campaign's success (I6).

In our research, it quickly became apparent that Ilkley's bathing water application was highly contentious in the water industry and among regulators. The following quote from a water industry representative summarizes this general sentiment: "[W]hat it's done is it distorted Yorkshire Water's spending priorities. I think

it is £80 million they're throwing at Ilkley. I can think of much, much better places to spend £80 million. Places that would have a much greater impact on water quality and on public perception" (I15). This first instance of activists utilizing bathing water regulations not only leverages institutional resources but also re-shapes social relations, as explored in Jensen and Morita (2017), based on the spaces of visible waste in their local environment. This sociotechnical shift in Ilkley has direct implications for the Yorkshire region and, because of the town's economic privilege, it can be criticized by those institutions it has leveraged.

Some interlocutors from the environment sector (both NGOs and regulators) suggested that rural activists in Ilkley and Knaresborough were unhappy with their place low down on the investment priority list: "[T]he way for them to jump up that list is to do what they're doing (apply for bathing water designation)" (I6). However, this priority list was often discussed abstractly, used to underpin the competing geographies argument, but was not publicly available to view. Further, in Bradford (a place with all the characteristics of being a high investment priority) people had not seen evidence of proactive investment or monitoring by Yorkshire Water. A member of a local river restoration group explained that they had taken 2000 photos over a 12-month period before Yorkshire Water would come and fix 50 sewer misconnections. Additionally, they discussed a recent £1.6 million fine Yorkshire Water received from the EA (EA 2024) because of a malfunctioning CSO, which they said the company knew about but chose not to report: "[I]f we hadn't happened to be there trying to take a sample for something, it would have gone on for another year or so" (I16).

In response to the bathing water success of Ilkley and the progress in Knaresborough, an interlocutor from Bradford commented, "Well, all power to them... it was a really clever move by the group in Ilkley. I just, I wish I'd thought of it, but that didn't apply" (I16). Although water and environment representatives commonly raised concern over how bathing waters are creating regional inequality, our research in Bradford suggests that activists there are more focused on their local rivers, celebrating them in community festivals (Bradford beck festival 2023) and uncovering sections where possible, seeking to open urban rivers up to the public. Although they do not have the same scale of influence as Ilkley in terms of setting investment agendas and influencing political action (Ilkley Clean River Group 2025), it seems this is not something they are striving for. They are, however, striving for Yorkshire Water and the EA to take better care of their urban rivers.

CONCLUSIONS

Overall, analyzing stakeholder tensions by asking how they problematize the issue of sewage discharges reveals many layers of contestation. First, the root problem is understood differently, with activists problematizing through notions of passive regulatory failure and active water company malice. Environment sector representatives similarly acknowledge poor regulation, but attribute this to cuts in state government funding and weak legislation. They consider sewage discharges to be part of a bigger problem, where the public does not acknowledge or understand their holistic impact on the natural environment. Most water industry representatives see the problem of sewage discharges as resulting from climate change rainfall patterns and inherited combined sewer design they do not have the capacity or mobilizable funding to substantively rebuild. They are also very reactive to the problematization of activists, which has gained substantial media traction, and they feel portrays them unfairly.

The root problem being so highly contested lays an unstable foundation for progressing toward sanitary reform. The solutions presented by stakeholders are themselves divergent, with environment representatives wanting to move toward holistic river health and nature-based solutions, water sector representatives desiring greater public trust to allow them to work through their expert priority investment list, and activists seeking to influence strong regulations to restrict the ability of water companies to neglect sanitation infrastructures.

We suggest that underpinning these layers of contestation are fractured sanitation imaginaries, which have splintered off from the modern ideal. While scholars write on modern imaginaries, they do not prescribe their explicit characteristics, as these become materialized uniquely in particular contexts (Lawhon et al. 2022). One of the first steps in envisioning the future of sanitation in England is answering the question: what exactly has modern sanitation promised in this context, and in what ways has it failed to materialize?

Stakeholders' disappointment over this failure has led to a splintering of future ideals for sanitation, which are currently in competition. The environment sector envisions a future where people care about rivers as entities or beings in their own right and appreciate the interconnections between human life and river health. This may mean giving up some human desires to use the rivers as we please. Activists express a strong goal for a future where sewage is rarely, if ever, discharged into the natural environment, expressing the immorality of this practice and the ultimate responsibility of water companies as bill (or rent) collectors. The water industry is disappointed by the unrealistic expectations of activists and the wider public, but appear stuck in the challenges they face, lacking a clear vision of an achievable future.

The Great Stink of 1858 showed that a sanitary revolution requires full political support and consensus vision for the future of sanitation. Although we focus on the aspect of vision, the role of the state is another crucial gap in this new iteration of the Great Stink. The high degree of sectorization and privatization in England has enabled the state to be complacent on this issue. Nonetheless, it retains ultimate responsibility for sustainable and equitable sanitation provision across the country as an essential service and a human right. In order to progress toward sanitary reform, we emphasize that both clear state support and a consensus stakeholder vision for the future are essential. The Great Stink in the 21st century has disintegrated the modern sanitation ideal in England, making the process of envisioning an incredible challenge, but one with revolutionary potential.

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Data Availability:

Anonymized interview transcripts will be made available in the open access White Rose research repository, as agreed with the University of Leeds' ethics and data management committees. Raw ethnographic data (field notes, observations, informal conversations) cannot be made publicly available given the sensitive nature the research and the risk of identifiability of interlocutors.

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