Research portfolio

A Regenerative Brownfield Development

A REGENERATIVE BROWNFIELD DEVELOPMENT
A (landscape) architecture towards an ecocentric, Third Generation London
Word count: 5430

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Architectural Design Crossovers | Heterogeneous London
AR3DC100 | Academic Year 2021/2022

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Key words:
Third Generation city,
Brownfield regeneration,
Ecocentrism, Fourth Nature,
Ecological restoration,
Regenerative architecture

Abstract

Over the years, the Anthropocentric societies are to blame for the problematic urban environments they have created. Destructive behavior towards the natural environment is part of the current paradigm, which has caused a major decline in biodiversity. The consequential human-nature dichotomy made us disconnected from our natural environment and lose our consciousness of it. To restore the ecology in our contemporary urban environment, we require a turning strategy. This is where the Ecocentric, Third Generation city framework emerges: a city aiming to learn from the mistakes made in the urban environment, followed by restoring them. Within the spectrum of restoration, it aims to restore the natural environment & re-connect the human conscious to the latter. Due to their post-anthropocentric characteristics, brownfields can be seen as the seeds for an Ecocentric, Third Generation city and have the potential to become a counter manifestive answer to the environmental issues: a regenerative development, focused on restoring the natural environment wherein human & the human-construct are considered a regenerative entity. Therefore this research introduces architecture & landscape architecture as a regenerative act towards the ecological restoration of the brownfields.

Multiple ecological brownfield developments can influence the larger urban organism and become the driver towards an Ecocentric, Third generation London, restoring the balance with the Anthropocentric urban environment.

Content

CHAPTER 1

Research paper

Research paper including research plan

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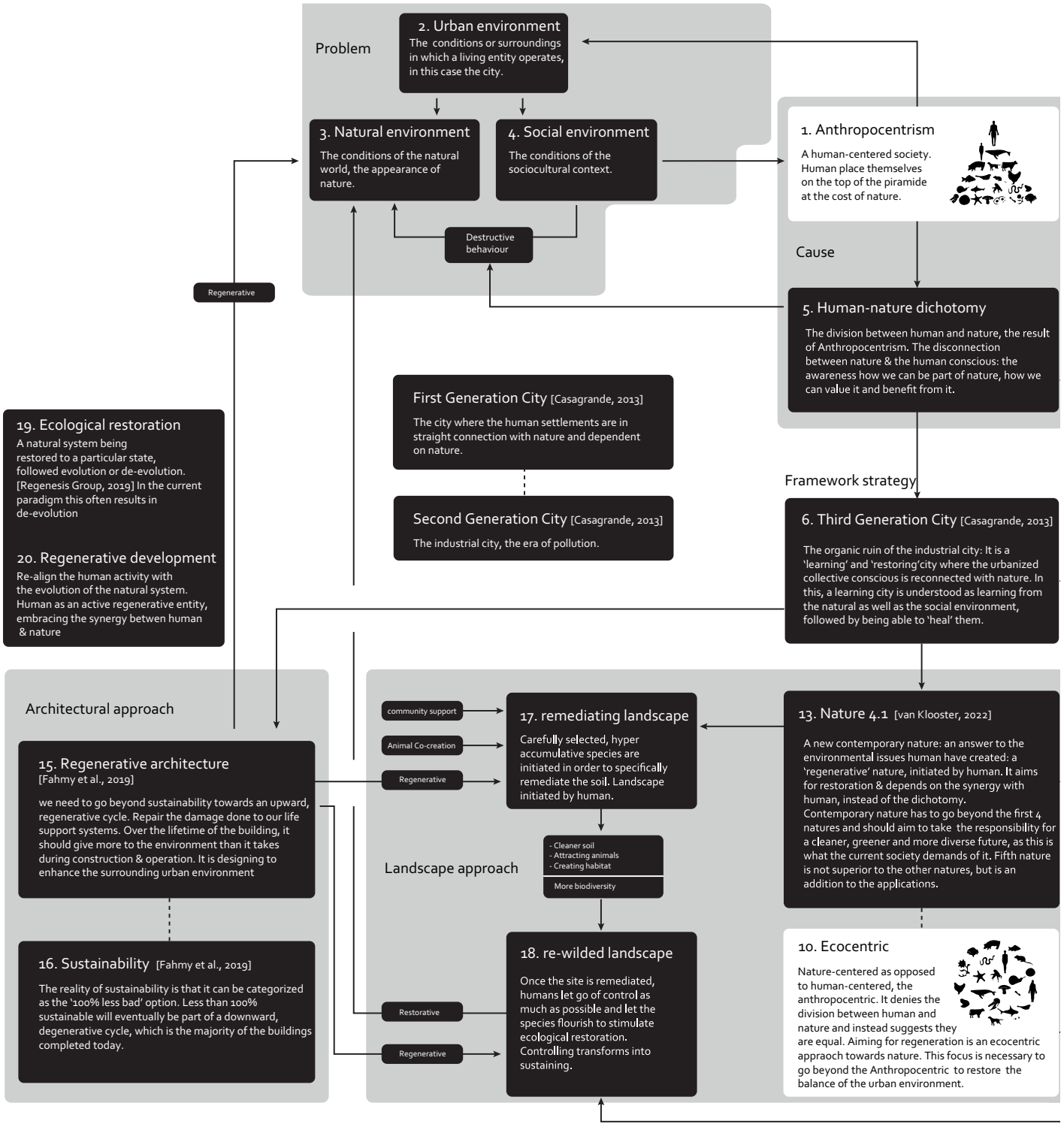
Problem
2. Urban environment
The conditions or surroundings in which a living entity operates, in this case the city.
3. Natural environment
The conditions of the natural world, the appearance of nature.
4. Social environment
The conditions of the sociocultural context.
Destructive behaviour
Regenerative
1. Anthropocentrism
A human-centered society. Human place themselves on the top of the piramide at the cost of nature.
Cause
5. Human-nature dichotomy
The division between human and nature, the result of Anthropocentrism. The disconnection between nature & the human conscious: the awareness how we can be part of nature, how we can value it and benefit from it.
First Generation City [Casagrande, 2013]
The city where the human settlements are in straight connection with nature and dependent on nature.
Second Generation City [Casagrande, 2013]
The industrial city, the era of pollution.
19. Ecological restoration
A natural system being restored to a particular state, followed evolution or de-evolution. [Regenesis Group, 2019] In the current paradigm this often results in de-evolution
20. Regenerative development
Re-align the human activity with the evolution of the natural system. Human as an active regenerative entity, embracing the synergy betwen human & nature
Framework strategy
6. Third Generation City [Casagrande, 2013]
The organic ruin of the industrial city: It is a 'learning' and 'restoring'city where the urbanized collective conscious is reconnected with nature. In this, a learning city is understood as learning from the natural as well as the social environment, followed by being able to 'heal' them.
Architectural approach
15. Regenerative architecture
[Fahmy et al., 2019]
we need to go beyond sustainability towards an upward, regenerative cycle. Repair the damage done to our life support systems. Over the lifetime of the building, it should give more to the environment than it takes during construction & operation. It is designing to enhance the surrounding urban environment
16. Sustainability [Fahmy et al., 2019]
The reality of sustainability is that it can be categorized as the '100% less bad' option. Less than 100% sustainable will eventually be part of a downward, degenerative cycle, which is the majority of the buildings completed today.
community support
Animal Co-creation
Regenerative
17. remediating landscape
Carefully selected, hyper accumulative species are initiated in order to specifically remediate the soil. Landscape initiated by human.
Landscape approach
- Cleaner soil
- Attracting animals
- Creating habitat
More biodiversity
18. re-wilded landscape
Once the site is remediated, humans let go of control as much as possible and let the species flourish to stimulate ecological restoration. Controlling transforms into sustaining.
Restorative
Regenerative
13. Nature 4.1 [van Klooster, 2022]
A new contemporary nature: an answer to the environmental issues human have created: a 'regenerative' nature, initiated by human. It aims for restoration & depends on the synergy with human, instead of the dichotomy. Contemporary nature has to go beyond the first 4 natures and should aim to take the responsibility for a cleaner, greener and more diverse future, as this is what the current society demands of it. Fifth nature is not superior to the other natures, but is an addition to the applications.
10. Ecocentric
Nature-centered as opposed to human-centered, the anthropocentric. It denies the division between human and nature and instead suggests they are equal. Aiming for regeneration is an ecocentric appraoch towards nature. This focus is necessary to go beyond the Anthropocentric to restore the balance of the urban environment.

Glossary - relation scheme

Side note: the subscripts in the Research paper refer to the terminology in this glossary scheme

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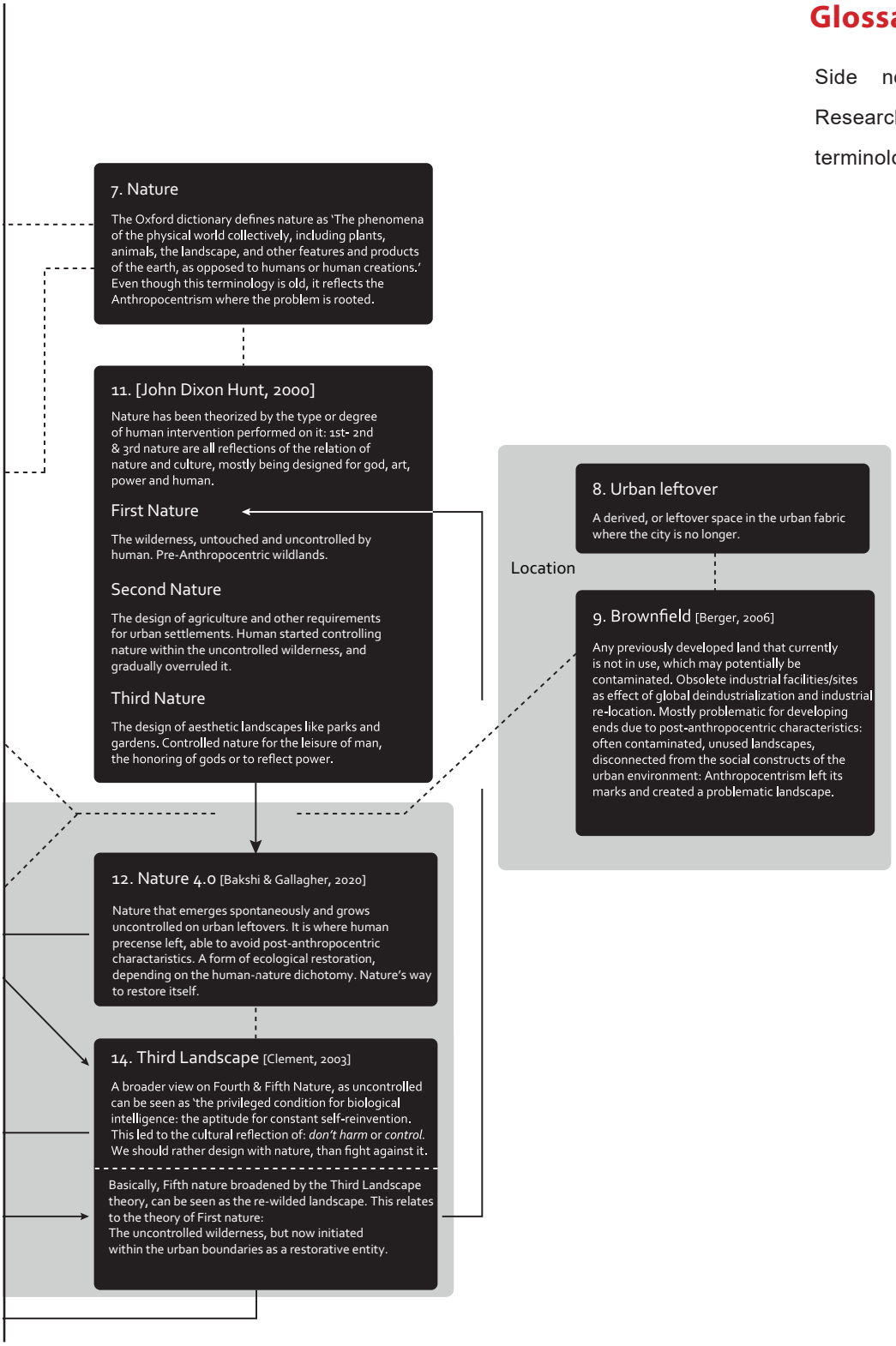


1. Motivation

Over the years, the Anthropocentric[1] societies are to blame for the problematic urban environments[2] they have created. [The Hasting Center, 2018] Destructive behavior towards the natural environment[3] is part of the current paradigm, which has caused a major decline in biodiversity. In the last 50 years, more than half of the world's wildlife have been lost, many of which are crucial to how ecosystems function and our food is produced. [Pawlyn, 2019] The consequential human-nature dichotomy[5] made us disconnected from our natural environment and lose our consciousness of it. [Casagrande, 2013] According to Micheal Hall, by 2050 nearly 70% of the world's population will live in these human-centered environments which will in the current paradigm, become increasingly more destructive for- & distant to the natural environment. Therefore, we require a turning strategy in our contemporary urban environment. As Anthropocentrism is the cause of the problem, it needs to be questioned within the research by aiming towards a more Ecocentric[10] strategy. This is where the third generation city[6] framework emerges. The Third generation city aims to learn from the mistakes made in the urban environment, followed by restoring them. Within the spectrum of restoration, it aims to restore the natural environment & re-connect the human conscious to this nature[7], as Casagrande acknowledges this connection resulting in awareness, as a necessity towards an Ecocentric urban environment. The Third Generation city can be seen as the ecological development in the industrial ruin, aiming for ecological restoration[19], where the social[4] & natural environment are interwoven again. [Casagrande, 2013]

London as the center of the industrial revolution was once the pinnacle of industrialism, the era of pollution. In contemporary London most industries left the dense city due to industrial re-location, but its aftermath is still integrated into its environment. These urban leftovers[8] derived from industrial re-location, are baptized as brownfields[9]. They are where the city is no longer and can be seen as places of opportunity in terms of ecological restoration: Due to years of absence of human activity, wildlife is often returning to the sites, potentially becoming a biodiversity hot-spot. [Bakshi & Gallagher, 2020] However, the current Brownfield development is still excessively anthropocentric, often neglecting their environmental duty & mostly resulting in expensive, high-end developments for a select group. [Appendix 1] Contradictory, especially these landscapes require a regenerative development[20] due to their potential & problematic post-Anthropocentric characteristics. [Berger, 2006]

Considering the current environmental issues, brownfield development should therefore become a counter manifestive answer to these issues: a regenerative development, focused on restoring the natural environment & reconnect the social environment to the latter, wherein human & the human-construct are considered a regenerative entity:

Architecture & landscape architecture as a regenerative act towards the ecological restoration of the brownfields. Therefore, the main question posed by this research is:

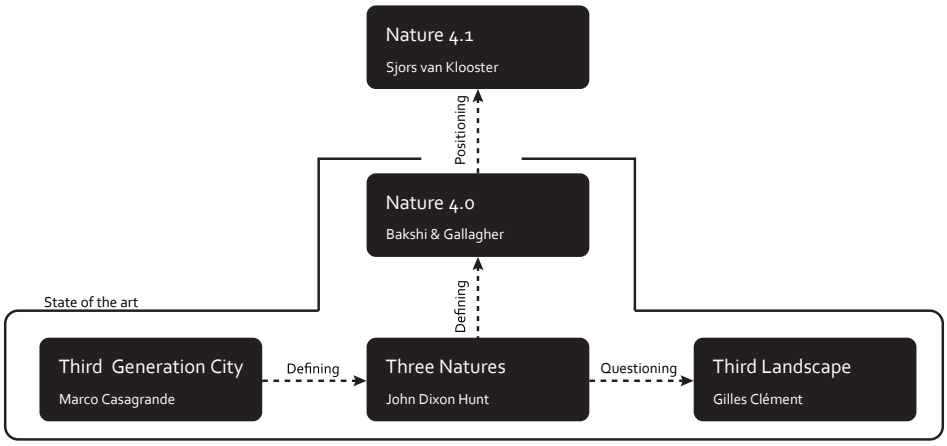
How can a (landscape) architectural design become a regenerative act towards the ecological restoration of the brownfields?

The research hypothesizes that a regenerative (landscape) architectural approach can support the ecological restoration of the brownfields and reconnect the human conscious to the latter: making them aware of how the current anthropocentric paradigm is destructive towards the natural environment, while they could form a synergy.

Multiple ecological brownfield developments can influence the larger urban organism and become the driver towards an Ecocentric, Third generation London, restoring the balance with the Anthropocentric urban environment.

2. Theoretical framework

The theoretical framework of this research taps upon 6 'state of the art' theories in combination with precedents that are all interrelated. Their relationship originates from defining, questioning and positioning within the theories, resulting in the framework of the Ecocentric, Third Generation city & the regenerative (landscape) architectural approach of the brownfield development.



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The first theory is one introduced by Finnish architect and bio-urbanist Marco Casagrande, who initiated the Third Generation city: The organic ruin of the post-industrial city. It's a learning and restoring city, which aims to learn from its environment, followed by restoring it. Casagrande sees the potential of connecting the human-conscious & the natural environment as the pinnacle of the Third Generation city.

Within this Third Generation city, 'nature' needs to be defined within the 'state of the art' followed by taking a position. This introduced the second and third theory: John Dixon Hunter's Three Natures[11] and Bakshi & Gallagher's Fourth Nature[12]. Fourth Nature, the pioneers on the post-industrial landscapes, slowly battle the post-anthropocentric characteristics and will, in time, restore the ecology of the landscape.

The third theory introduced is Gilles Clement's 'Third Landscape' theory[14]: Therefore we have to go beyond the controlled, Anthropocene nature towards the uncontrolled, nature. This is what Gilles Clément [2003] describes as the Third Landscape. From a fixed end-point model of restoration towards recognition of the need to work more flexible with nature: rather design with nature, than fight against it. Without human interference, nature has the possibility to re-invent itself, as this is the most preferred condition for nature to flourish. [Bakshi & Gallagher, 2020].

Nature that emerges spontaneously or grows uncontrolled on urban leftovers can be seen as 'the privileged site for constant self-reinvention', which is basically a description of Fourth Nature stating that these wild conditions is what makes this nature thrive and become the most biodiverse.
However, this wild Fourth Nature is still reflecting a human-nature dichotomy and is not efficient in time: The post-anthropocentric characteristics make it difficult to become biodiverse. Due to the urgency of ecological restoration this research positions itself within the notion of a more relevant contemporary nature, a secession of the Fourth Nature: 'Nature 4.1'[13]: an answer to environmental issues human have created: a nature initiated by human as regenerative act towards ecological restoration. Nature 4.1 has to go beyond the first four natures, aiming for a more efficient restoration by embracing the human-nature synergy instead of a dichotomy. Even though a synergy should be more efficient, the wild conditions Clement suggests should be implemented in the timeline of the restoration.
Nature 4.1 is human taking the initiative for the urgency of cleaner, greener and more biodiverse future, as this is what the current society demands of it. It is not superior to the other natures, but is an addition to the applications.

However, the concept of 'restoring' ecology or ecosystems is a misnomer in its terminology. Discussed by Regenesis Group (2015), an ecosystem can not be restored to its original conditions because it's a living entity, not static. Whenever an ecosystem is restored in a particular state, there will be a process of evolution or de-evolution. Therefore ecological restoration is about the relation with human: if human systems don't change, destructive behavior will always result in a de-evolution and the natural environment will be in a constant need of restoration. This is where a regenerative development aims to change: where traditional restorative approaches embraces the decrease of human activity to conserve nature (human-nature dichotomy), a regenerative development aims to re-align the human activity with the evolution of the ecosystem. Human as regenerative entity. Therefore, the link between ecological restoration and (landscape) architecture is found in the responsive & regenerative qualities[15]. Where sustainable design[16] aims to 'do no more harm', creating as little impact as possible, regenerative design aims to leave a positive impact on the environment & the restoration process, to harmonize and support local natural systems. Over the lifetime of the building, it should give more to the environment than it takes during construction & operation. This is what the regenerative brownfield development is aiming for. This theory is extensively discussed by Fahmy et al. in the journal of Regenerative Architecture as a Paradigm for Enhancing the Urban Environment. (2019)
Precedents & theory combined makes it possible to see relationships in the theory and take a position within.

3. Methodology & Method

The methodology & methods aim to develop the regenerative approach for brownfield development, the most oppurtune-full brownfield and the conduction of the strategy upon. The methodology of this research can be explained according to two different approaches: the contextual & the theoretical approach. These two approaches run simultaneously and form a synergy. The theoretical approach aims to provide the knowledge necessary from the State of the arts for the understanding of the overall conditions of the regenerative brownfield development in a research essay, giving guidelines to the design, whereas the contextual approach aims to map the site- data and knowledge to identify potential sites including the threats and opportunities.

The theoretical approach

A research paper of the contemporary brownfield regeneration approach, will be an elaboration of the framework derived from the state of the art, including a position that aims to persuade the reader to think differently about our relation with our urban environment. Precedents will support the approaches and choices made in the design. The research paper will answer the following questions:

What are the threats & opportunities of the brownfield regeneration strategy within the Ecocentric, Third Generation London Framework?

What are the guidelines for the (landscape) architectural design approach as regenerative act towards the ecological restoration of the brownfield?

The contextual approach

The contextual approach aims to map the site data and -knowledge to identify potential brownfield sites including its threats and opportunities. On the scale of London, 6 filtering lenses are applied, filtering down to the most opportune-full site, making the research feasible and most potential-full:

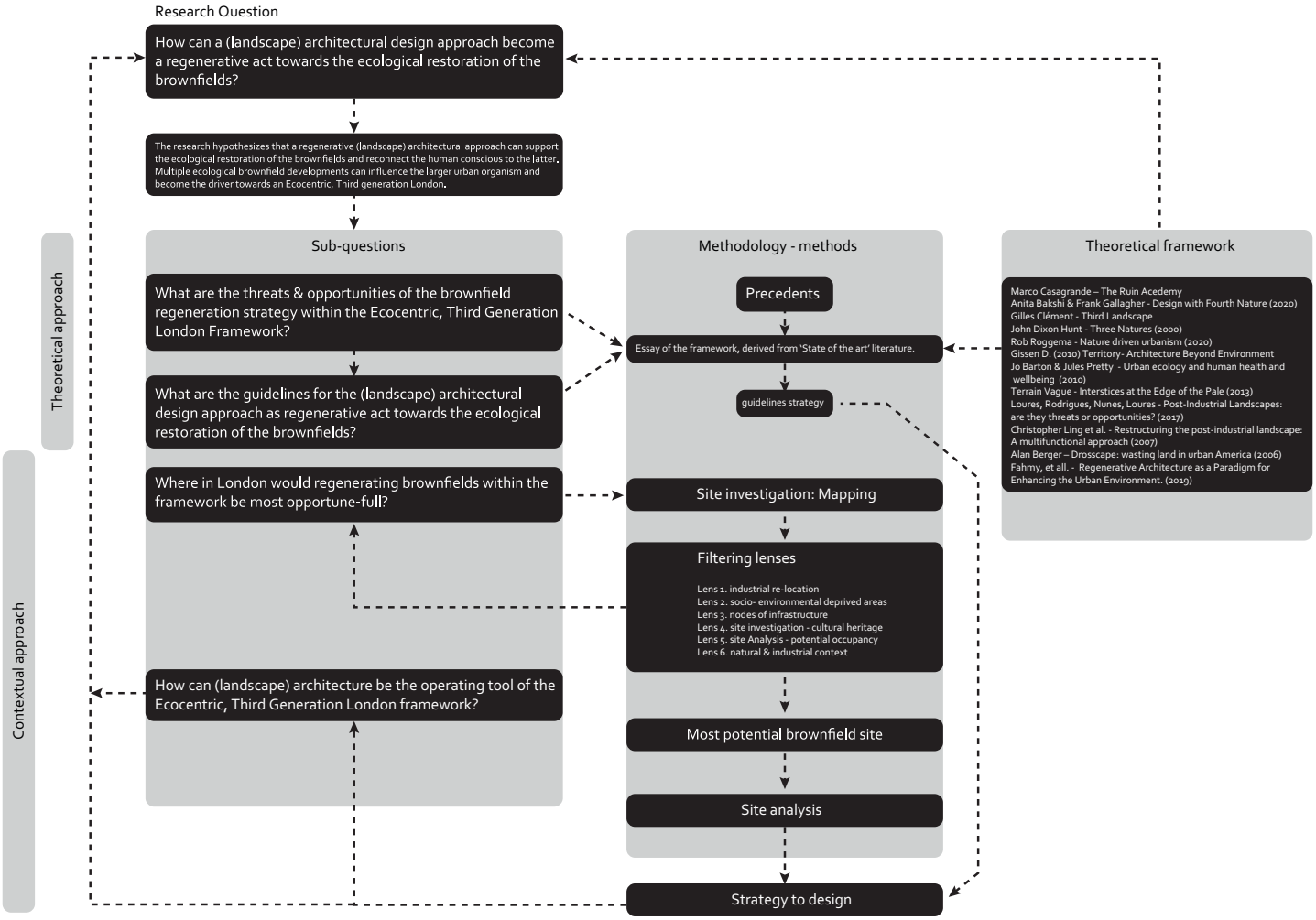
Lens 1. industrial re-location
Lens 2. socio- environmental deprived areas
Lens 3. nodes of infrastructure
Lens 4. site investigation - cultural heritage
Lens 5. site Analysis - potential occupancy
Lens 6. natural & industrial context

The lenses are mapped in catalogues and maps, filtering towards the most opportune-full brownfield, followed by the site analysis of the chosen brownfield site. Deriving from the analysis & the guidelines, a (landscape) architectural design will develop, fitting the vision of the latter. The mapping and site analysis combined with the vision of the strategy derived from the research essay, will lead to the conduction of the design. The contextual approach will answer the following questions:

Where in London would regenerating brownfields within the framework be most opportune-full?

The final design will derive from the site analysis in combination with the guidelines provides by the theoretical approach.

4. Research diagram



5. Argument of relevance

The problems of the Anthropocentric urban environment is not unique to London. The poblematic urban environment, the decrease in biodiversity, the human-nature dichotomy and the Anthropocentric paradigm causing it are common in most urban metropoles. Therefore, the Ecocentric, Third Generation city framework combined with the regenerative development approach of the brownfields as discussed, would be relevant for most of them. London specifically as center of the industrial revolution, was the pinnacle of industrialism, the era of pollution. Due to the abundance of brownfields in the urban environment of London, a counter manifestive development as the one discussed in the research paper, will be most suitable. In addition, the movement of human & human-construct as a regenerative act towards the natural environment is a necessity for building practices in general.

6. Position - argumentation

The research paper discusses the vision of the regenerative brownfield development as a reflecting device for the design project, providing guidelines to follow. The paper is divided in two main approaches:

- **The landscape approach**
- **The architectural approach**

Even though discussed as separate entities, they are not seen as such, but are entangled and function simultaneously.
To address the urge of restoring the ecology in the larger urban organism, the general guidelines of the regenerative brownfield development are discussed, in consideration for application to any potential brownfield development. The following design project will be the proven case of the approach, with the city of London and the chosen site as a case study. However, the approaches as discussed in this paper aim to be descriptive towards the generic vision & characteristics.

The Landscape approach

A contemporary Nature

The landscape approach of the essay discusses the ecological values of different restorative landscape typologies. Their restorative qualities for the natural environment are discussed and questioned, providing a guideline for the design of the landscape of the brownfield.

Over the years, nature has been theorized by the type or degree of human intervention performed on it: First, Second and Third nature are all reflections of the relation between nature and culture in the landscape. [John Dixon Hunt, 2000] A more contemporary nature is currently being discussed as Nature of the Fourth kind: These Fourth Nature landscapes are sites of formerly intensive human use, like the brownfields, that have been recolonized by plant communities. (See Figure 1.) These pioneer plant communities are uniquely adapted to the post-anthropocentric characteristics & can avoid or clean soil contamination. Due to the human-untouched characteristics, Fourth Nature is by some considered the closed to wilderness and has the freedom to re-invent itself, i.e. become more biodiverse than a human-controlled nature. [Bakshi & Gallagher, 2020]. Due to the years of absence of human activity, the brownfield is often a hot-spot for wildlife. Current developments often neglect this appearance and where ecosystems finally have a chance to re-flourish, they are again destroyed due to our anthropocentric approach. In these situations, leaving nature be is stimulating the re-wilding and therefore the ecological restoration of the landscape. However, as previously discussed, Fourth Nature as restorative entity basically reflects the current human-nature dichotomy & is not efficient considering the urgency for ecological restoration. Nature is retrieving where human is not active & destructive anymore, but takes a takes considerate time due to post-anthropocentric characteristics.

While Fourth Nature can be seen as nature's protest towards the Anthropocene, the efficiency of Fourth Nature can be questioned. Due to the contamination issue of the soil of the brownfield, only limited amount of pioneer plant species can find their away around it. The cleaner the soil, the more species can thrive on the brownfield, the more biodiverse the ecosystem. Due to dependency of random ecological events, it will take considerate time before the soil is clean enough for more species to thrive and to become as biodiverse as necessary.
As previously discussed, when considering the urgency of restoring the natural environment, one could argue that there is need for a more efficient nature. Therefore this research positions itself within the notion of a more relevant contemporary nature, a secession of the Fourth Nature:

'Nature 4.1'

An answer to environmental issues humans have created: a *nature initiated by human as regenerative act towards ecological restoration.*

Nature 4.1 has to go beyond the first four natures, aiming for a more efficient restoration by embracing the human-nature synergy instead of a dichotomy. It is human taking the initiative for the urgency of cleaner, greener and more biodiverse future, as this is what the current society demands of it. It is not superior to the other natures, but is an addition to the applications. The brownfield as re-wilded landscape has the potential to become a restorative pinnacle in the urban environment, where the synergy between human & nature will introduce the community as regenerative entities. As opposed to Fourth Nature, Fifth Nature is depended on this synergy. Due to the post-anthropocentric characteristics, the key of the landscape approach is in **reversing the timeline** of the brownfield:

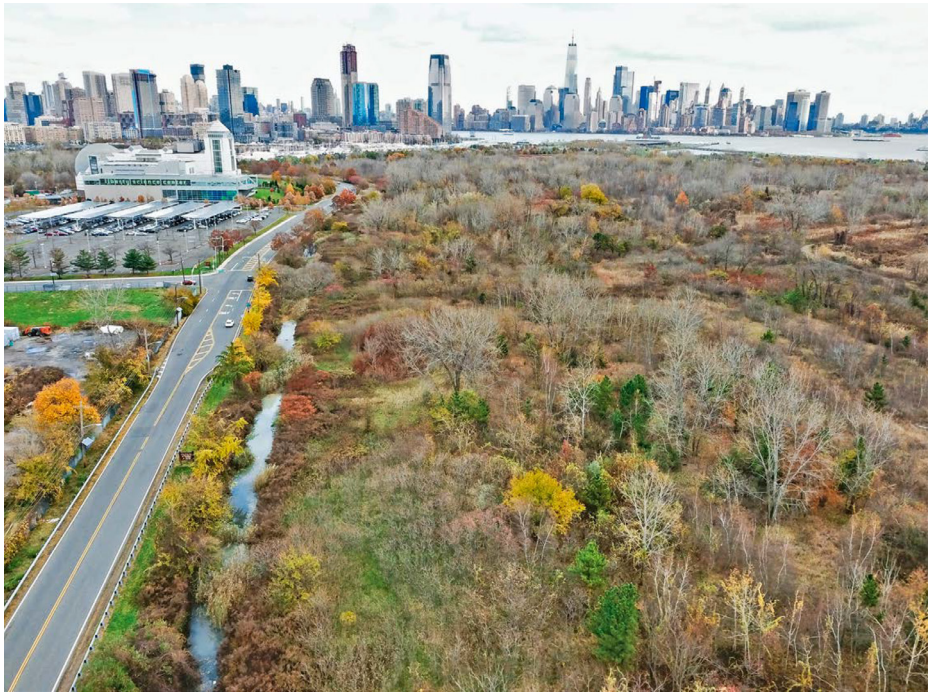
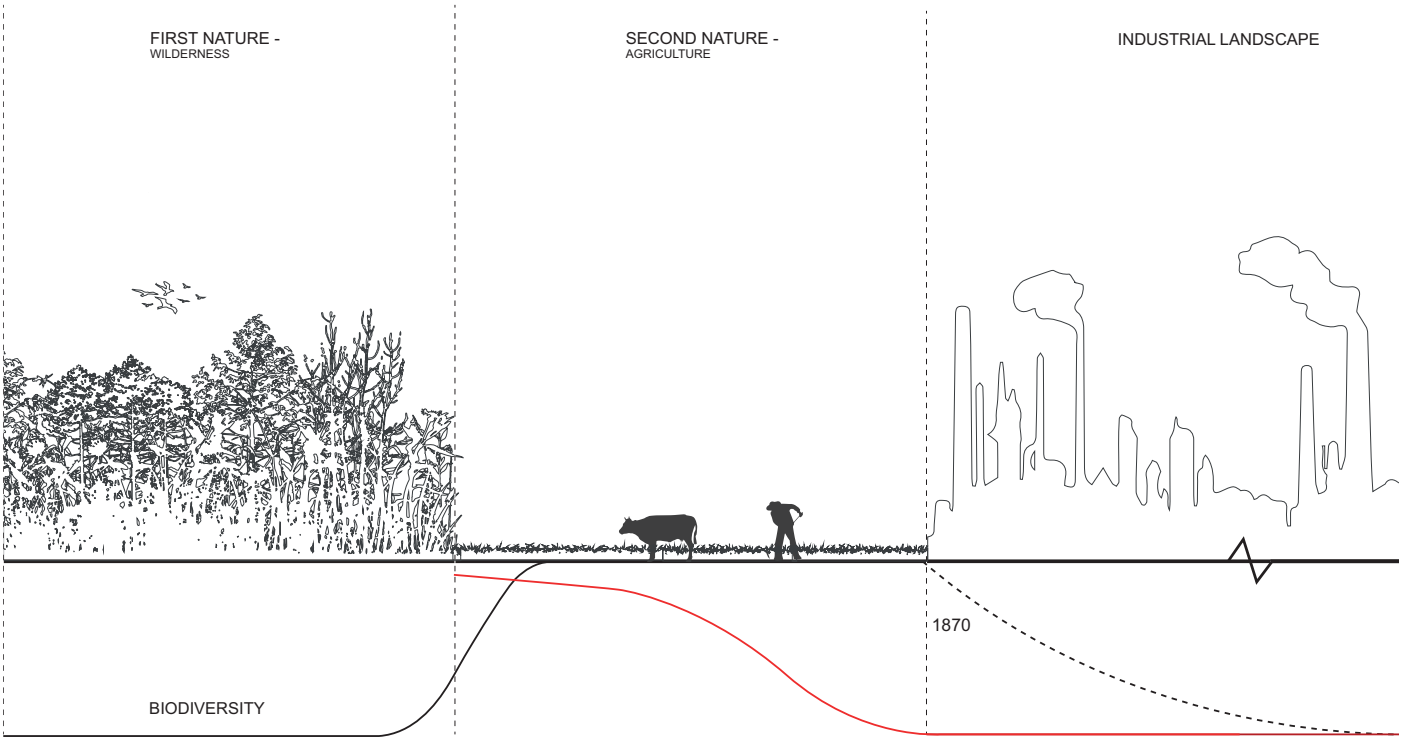


Figure 1.
The undeveloped brownfield section of Liberty State Park, previously functioning as railyard. Perfect example of Fourth Nature returning where human activity leaves. However, functioning due to the traditional model of restoration: reflecting the human-nature dichotomy. Besides, limited in becoming biodiverse due to post-anthropocentric charactaristics. [Bakshi & Gallagher, 2020]



Reversing the timeline
[own image]

First nature

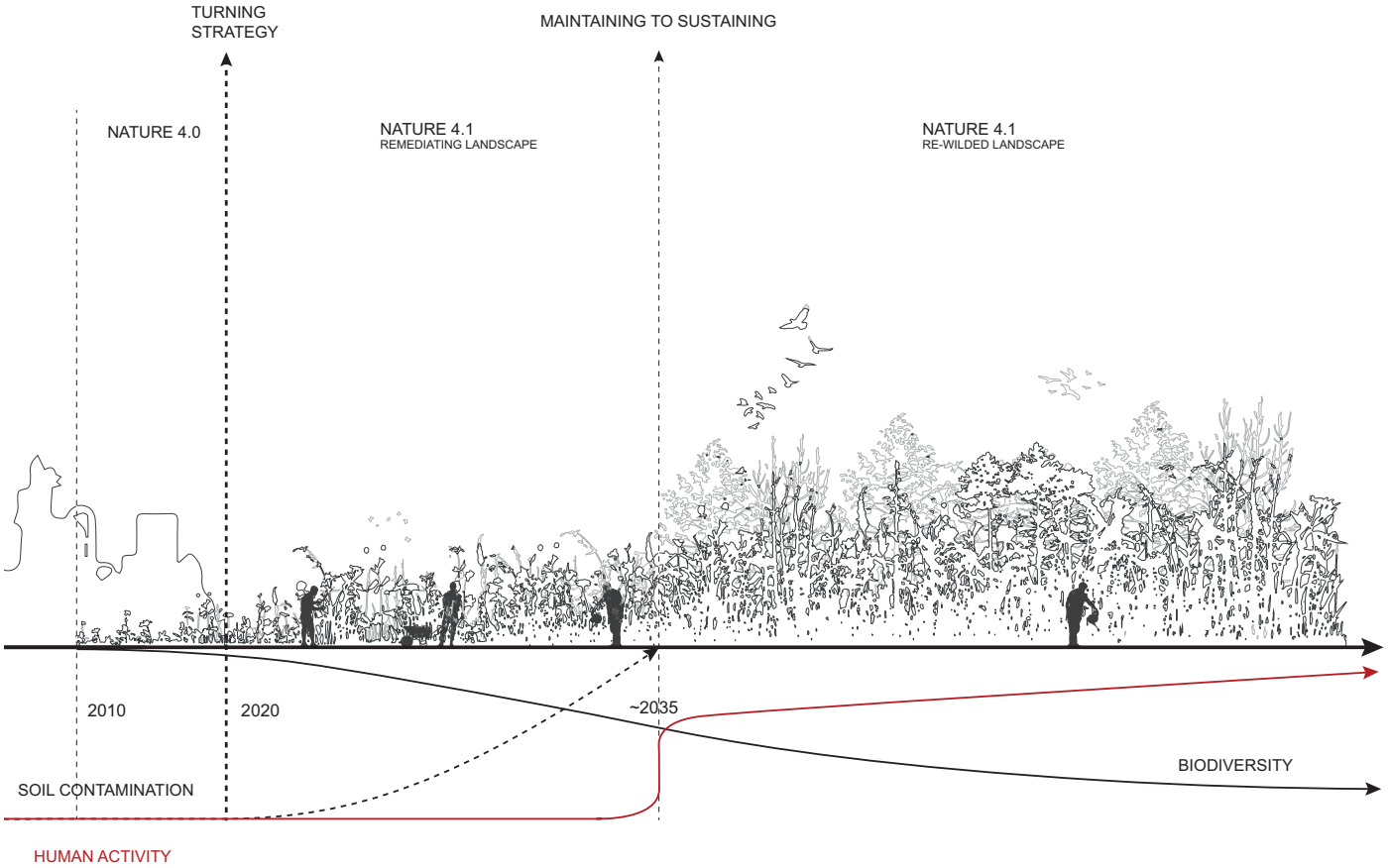
[John Dixon Hunt, 2000]

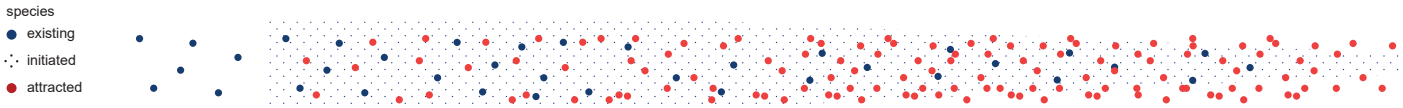
First Nature, the wilderness: considered as true nature and praised for its biodiversity and pureness. The pre-Anthropocentric conditions make it as such: the unexpected, uncontrolled conditions and the abundance of native species.

Second nature

[John Dixon Hunt, 2000]

Second Nature, the agricultural lands designed for urban settlements: Human started controlling nature within the uncontrolled wilderness and gradually overruled it. The number of native species and other biodiversity decreased rapidly. The controlled condition restrained nature from re-flourishing.





The industrial landscape

The industrial landscape: Since the Industrial Revolution, human activities drastically contaminated the soil, water and air in the urban environment. We entered the era of pollution and the creation of the brownfield.

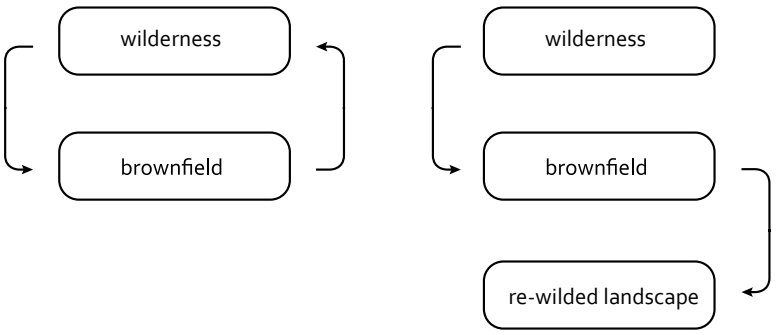
Nature 4.0

[Bakshi & Gallagher, 2020]

Fourth nature, the spontaneously grown nature: When most industries re-located towards the outer city, human activity left, with the result of new plant communities occurring. These native species are by some considered the closed to wilderness and therefore should be retained in the landscape. Nevertheless, it can be questioned whether Fourth nature is the efficient enough for the urgency of ecological restoration.

The turning point

By aiming to reverse the timeline and strive towards ecological restoration, the landscape approach emphasizes wilderness as the ultimate ecocentric condition for nature to flourish. However, according to Pollan, in the book 'Second Nature', True wilderness requires as little human interference as possible and once touched, it cannot be considered as such anymore. A landscape is typically written off as fallen for nature, when the landscape is no longer 'virgin' or untouched by humanity. Humanity trying to engineer true wilderness is not possible: it can only be where humans do not intervene. [Pollan, 2003] The timeline from wilderness to the brownfield is therefore irreversible, as the abused landscape in terms of human interference, is the opposite extreme of the wilderness. Even though true wilderness is unachievable for humans to regenerate, we are capable of initiating nature which strives towards similar conditions: unexpected, uncontrolled conditions and the appearance of native species. [Gilles Clement, 2003][Davies, 2013] This research therefore introduces this process of re-wilding the landscape. Because this is a human-initiated nature, the key towards creating this re-wilded landscape can be found in landscape & gardening practices.



Nature 4.1
Landscape & gardening practices

According to Grant (2013), gardens or landscapes are not merely green, natural areas, but are considered to be a cultural/natural artform: a physical expression of the values and beliefs of culture, therefore overarching the theory of the four natures [Bakshi, 2020]. Nature 4.1 too is considered a gardening practice: the initiation of the landscape, according to the values and beliefs of culture. The cultural belief of the gardening practices of Nature 4.1 is reflected as an answer to environmental issues and post-human conditions the anthropocentric society has created, promoting the synergy between human & nature, instead of embracing the division. This is where gardening starts shifting approach from initial gardening and distinguishes itself. Nature 4.1 can be considered in between the practices of First nature & Second/Third Nature. It is gardening principles with the aim for wilderness conditions: the creation of the re-wilded landscape. Controlling nature as little as possible and merely for the beneficial ends. However, due to post-anthropocentric issues, a previous step is necessary for a more efficient ecological restoration.

Nature 4.1
the remediating landscape[17]

The first necessary landscape typology for the strategy of brownfield regeneration is considered a remediating landscape. Carefully selected, invasive, hyper accumulative species are initiated in order to specifically remediate the soil. In order to sustain the remediation process, it needs to be carefully conditioned. Different pollutions demand different landscape cultures and every landscape culture demands different maintenance. [Appendix 1. De Ceuvel] The result is the possibility of community engagement in the landscape approach. Involving the community in maintaining the remediating landscape, is the first step in creating the synergy between nature and the community and stimulates to reconsider an Ecocentric position. This strategy of remediating brownfields while retrieving ecology is not a new process, though research done is in the very early stages. Therefore, this process is a continuous research feedback loop and all new initiated & spontaneously emerging species are tested for their remediating qualities. [Appendix 1. De Ceuvel]

This gardening principle is an answer to the years of contamination, decrease of biodiversity and is considered the first step necessary in the landscape approach towards the re-wilded landscape. Once the landscape is decontaminated, the soil can host more plant communities than before. We can let go of most control and the remediating garden can transform into the re-wilded landscape. Therefore, the initial, remediating landscape needs to be designed to be able to become wild, meaning to embrace the wilderness conditions in the landscape: unexpected, uncontrolled conditions and the appearance of native species. Native species sustain twice as much biodiversity than invasive species and are therefore a necessity to create healthy biodiversity. [Davies, 2013] Once we step out of controlling the remediating garden, the landscape needs to attract these native species, thus the remediating garden needs to be animal co-created, as the key to the attraction of unexpected native, as well as invasive species is to attract pollinating and seed spreading animals. Attracting those animals is the key to stimulating ecological restoration. [Appendix 4. Co-creation with animals]

Nature 4.1
the re-wilded landscape[18]

Once the site is remediated, humans let go of control as much as possible and let the species flourish to stimulate ecological restoration. Controlling transforms into sustaining. Due to the animal co-created landscape, the decrease in pollution & human (un)controlled conditions, the attracted species can now grow unexpected and wild on the landscape, resulting in a vibrant mix of native and invasive species. It still demands gardening practices that stimulates community involvement, but a step back is taken. Human only intervenes for the benefit of biodiversity

These garden principles are the regenerative tools of the landscape approach of the brownfield regeneration strategy and emphasizes the counter-manifestive approach of the strategy towards an Ecocentric society. By human initiating Nature 4.1 a more efficient ecological restoration should be stimulated.

Limitations

An important notion is that the landscape approach described above is the common ground. Designing landscapes & gardens is a vulnerable task as nature is a living entity. The landscape is in a continuum of development or regression and is influenced by a large scalar of events. The execution is different in every situation of gardening practices. Every context has its limitations or opportunities and demands different specific landscape designs and maintenance, within this multi-scalar landscape approach. Some unexpected species will rather harm the new system than contribute to it. Therefore sustaining for the benefits of nature is a necessity and never the same. It aims for the same goal but entails a different execution in every case. The project focuses on the general vision of this landscape approach in combination with assumptions, rather than the ultimate technical solution of the landscape. The efficiency of Nature 4.0 & 4.1 will be different in every situation, but should be tested on the designated brownfield. The development provides the possibility of both embracing the Nature 4.0 and initiating the Nature 4.1 as ecologic restorative landscape typologies.

Regenerative landscape design

An example of how the previously discussed Landscape typology of the fifth nature can be translated into a landscape design as regenerative act:

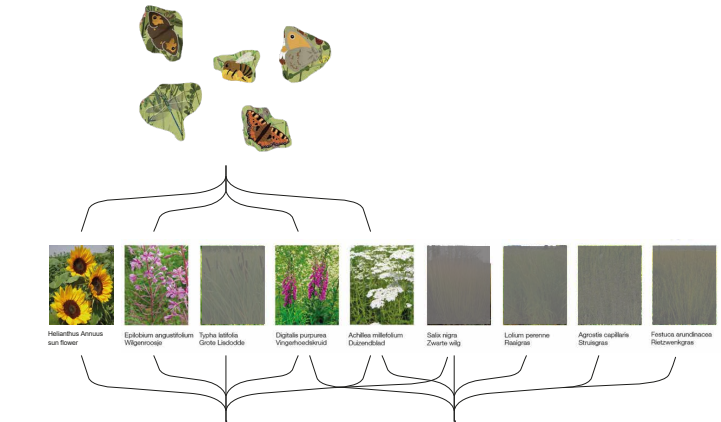
The landscape becomes a reflection of the pollution, as every pollution stain needs a different hyper accumulative landscape culture. To create access & a manageable system, elevated pathways create paths or the community to be able to maintain & access the 'forbidden' garden. Every landscape culture is then designed to attract animals like pollinators & seeds spreaders, as this is key in ecological restoration & re-wilding.

Together with Nature 4.0 & Nature 4.1 different landscape typologies can be tested on their restorative qualities.

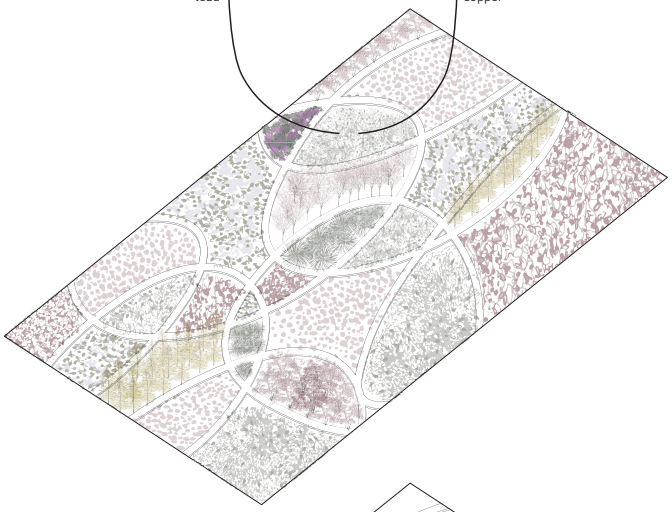
Animal co-creation

-

Remediating landscape



Landscape cultures



Access

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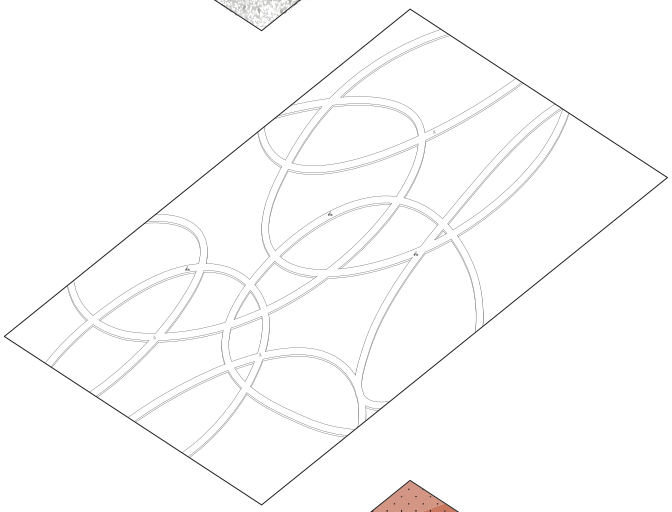
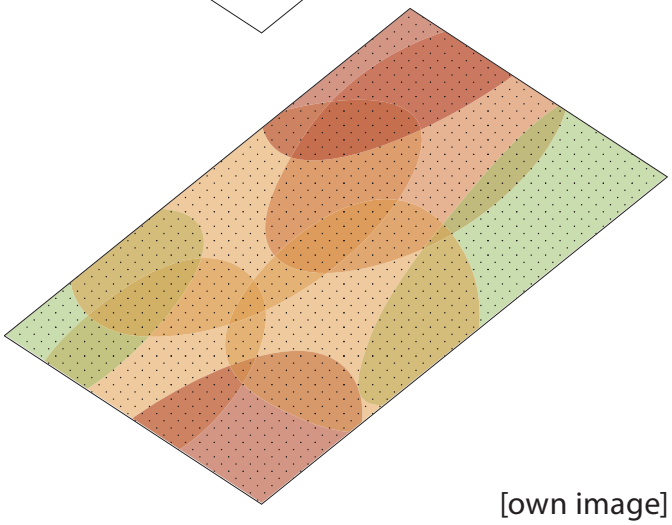
Manageable system



Pollution



[own image]

The Architectural approach

The essay describes the architectural approach as the vision of the architecture within the regenerative brownfield development. Besides creating this restorative landscape approach, it needs an architecture that is aiming to be responsive to these restorative needs & the environmental issues an sich: integrating regeneration as part of building practices.

Responsive to the restorative needs of landscape

In the remediating phase, human activity & appearance is high due to the demand for maintenance. In this phase, human activity is not destructive to the ecosystem. The contrary, a level of human activity is necessary for the maintenance of the landscape. [Appendix 3, De Ceuvel] Therefore, in this phase where the landscape function as an ecological construction yard, the development could stimulate community engagement, like at the Ceuvel. Creating a synergy between the community and the needs of the landscape. The community as a regenerative entity [Regenenis Group, 2015] Whenever (part of) the landscape is finished remediating, the landscape shifts focus towards re-wilding & from maintaining to sustaining. According to the traditional framework for ecological restoration, human activity & appearance needs to be as low as possible, as this can be destructive to the re-wilding process. The typology of the nature reserve, which preserves ecological development, reflects the needs of the process [Regenesis Group, 2015] The architecture could respond to this switch of ecological construction yard towards nature reserve, by lowering the human activity in the process of re-wilding.

However, this traditional approach is emphasizing the human-nature dichotomy by excluding human from nature to preserve it. Like previously discussed, [Theoretical Framework] this is where a regenerative development aims to re-align the human activity with the evolution of the ecosystem.

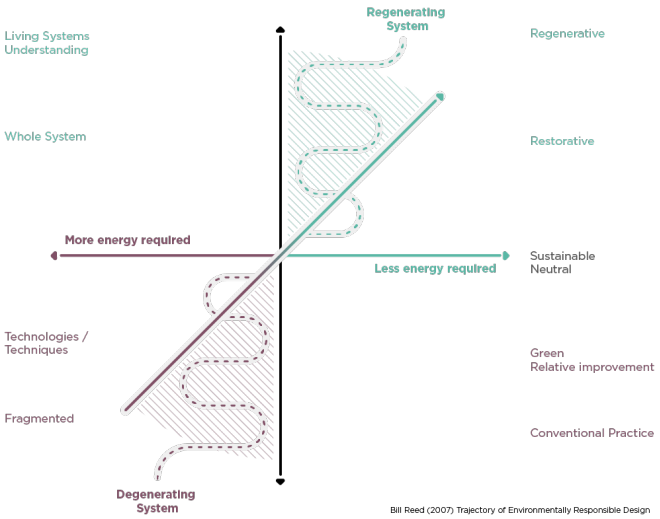


Figure 2
The Trajectory of Environmentally Responsible Design and the transition from conventional to regenerative design [Reed, 2007]

Regenerative architecture

The building industry is a very high contributor to the many issues today's world is facing. Especially in today's building practices. Over the past 30 years, sustainability as a guideline in our building practices has failed. Most buildings are designed for the needs of the moment, not considering the ecology, environmental needs & the future. [Fahmy et al., 2019] Sustainability has not made enough progress to ensure our society will exist at the end of this century. The reality of sustainability is that it can be categorized as the '100% less bad' option. Less than 100% sustainable will eventually be part of a downward, degenerative cycle, which is the majority of the buildings completed today. Therefore we need to go beyond sustainability towards an upward, regenerative cycle. Repair the damage done to our life support systems [Pawlyn, 2019]. In addition, we need to change how we see humans in the world. Humans are part of nature and should behave like this, declining the human-nature dichotomy. Where sustainable design aims to 'do no more harm', creating as little impact as possible, regenerative design aims to leave a positive impact on the environment. Over the lifetime of the building, it should give more to the environment than it takes during construction & operation. [Fahmy et al., 2019] It is designing to enhance the surrounding urban environment, going beyond producing its own energy and capturing its own water. Regenerative buildings can affect the surrounding urban environment in multiple ways:

Environmentally

Regenerative buildings have the capability to produce more energy & treated water than the building consumes and share this with the local grid. Other examples are the ability to provide habitat for lost wildlife and plant species, restore the natural hydrology by recharging the groundwater system, compost waste and create opportunities for urban agriculture. [Appendix 5] [Fahmy et al., 2019].

Economically

A quick return of investment due to the independence in water & energy needs, even providing adjacent systems with clean resources. [Fahmy et al., 2019]

Socially

Regenerative architecture in the urban context has impactful educational values on the surrounding communities. These buildings function as informative hubs to raise awareness of the environmental issues on one side, while embracing the interaction between human & nature by demonstrating of regenerative techniques. [Fahmy et al., 2019]

Regenerative building practices could be seen as a movement responsive to the environmental issues, with the ability to change the current, degenerating paradigm, towards a future where human & nature can be seen as interwoven: regenerative buildings practices aim for an Ecocentric society. The development needs to find the synergy between the regenerative model & the traditional preserving model. Every development demands different approaches and all should be considered.

7. Conclusion

The paper provides the designer or developer with a vision for a regenerative development for the brownfield. This strategy is not a strict script, but rather a vision providing guidelines. Even though some of the approaches can be questioned and need testing, it is a development stimulating regeneration in the urban environment. It aims for a more efficient ecological restoration of the brownfield by introducing Nature 4.1, then merely embracing Fourth Nature. In addition, it introduces a responsive, regenerative architecture as changing paradigm for sustainability: leaving a positive impact instead of reducing a negative impact, aiming to address the environmental issues & natural surroundings. Seeing human & human construct as part of nature is within its philosophy and it aims to stimulate an Ecocentric mindset. The regenerative landscape & architecture approach with the community as engaging entities has the possibility to create awareness and reconnect the human-conscious to nature by interweaving the social & natural environment. The brownfield development reflects a counter-manisfestive answer to the current urban environmental issues. Therefore, it can be concluded that the guidelines for the (landscape) architectural approach as a regenerative act towards the ecological restoration of the brownfield, can be the driver towards an Ecocentric, Third generation London, Where multiple brownfield developments eventually aim to influence the larger urban organism.

However, many aspects are questioned as the natural environment is a living entity. It's potential but also fragility in combination with all the different environmental conditions makes the strategy vulnerable, however its generality makes it applicable. It's a guideline where every situation has its own specific solution.

8. Annotated bibliography

Anita Bakshi & Frank Gallagher - Design with Fourth Nature (2020)
John Dixon Hunt - Greater Perfections: the Practice of Garden Theory (2000)
Clément, G. - The "Manifeste du Tiers-Paysage" (2003)
These essays discuss the theory of Three Natures and Fourth nature in combination with the Third Landscape theory, which broadens the view towards the uncontrolled, Ecocentric nature. Within these theories is where the research positions itself.

Marco Casagrande – The Ruin academy
Marco Casagrande, a Finnish architect, bio-urbanist and social theorist set up the Ruin Academy as hotspot for the research related to the Third Generation city. The academy wrote several essays regarding this topic, among other things: From Urban Acupuncture to the Third Generation City (2013) & Paracity (2014). Casagrande's works are in between urban design, environmental design, architecture, science & environmental art which makes his crossover architectural thinking important for the research.

Gissen D. Territory- Architecture Beyond Environment (2010)
This essay discusses the autonomy status of territory, and territory as 'produced' or as 'given'. It states architecture as: 'A material and theoretical 'genesis device' – a machine that makes environments but also ideas about nature and environments.' These theories reflect on the role of (landscape) architecture within these territories.

Rob Roggema - Nature driven urbanism (2020)
A bundle of essays and manifestos that gives insights into urban design theory in relation to nature. This bundle is therefore used for a broad range of theoretical backgrounds.

Jo Barton & Jules Pretty - Urban ecology and human health and wellbeing (2010)

This research discusses how nature influences human health in urban environments.

Terrain Vague - Interstices at the Edge of the Pale (2013)

This bundle of essays discusses the concept of 'Terrain Vague', the undetermined, interstitial, ambiguous spaces of the city. The postindustrial landscape can be regarded as such. These essays shed light on the problems and opportunities of these spaces.

Alan Berger – Drosscape: wasting land in urban America (2006)

This book is a guide to the field of waste landscapes. It discusses the problems of toxic wasteland and how the landscape architect should address this: there is a need for the reconceptualization of thinking about the landscape before potential solutions can be effectively addressed. It examines ten sites, both visually and analytically, using geospatial maps & charts and aerial photography. This book is both useful for theory and methods of analysis.

Loures, Rodrigues, Nunes, Loures - Post-Industrial Landscapes: are they threats or opportunities?(2017)

Christopher Ling et al. - Restructuring the post-industrial landscape: A multifunctional approach (2007)

These researches present an overview of the threats and opportunities of redeveloping postindustrial landscapes. Case studies with different cultural & social values result in an overview of the threats and opportunities of redevelopment and new strategies.

Fahmy, A., Abdou, A., & Ghoneem, M. - Regenerative Architecture as a Paradigm for Enhancing the Urban Environment. (2019)

This Essay discusses the possibilities of regenerative architecture. Insights on how the design of these building can influence the urban environment. Theory behind regenerative architecture explained.

9. References

Bakshi, A., & Gallagher, F. (2020, December). Design with Fourth Nature. https://doi.org/10.1080/18626033.2020.1852690

Barton, J., & Pretty, J. (2010). Urban ecology and human health and wellbeing. Research Gate. https://www.researchgate.net/publication/285118479_Urban_ecology_and_human_health_and_wellbeing

Berger, A. (2007). Drosscape: Wasting Land in Urban America (1st ed.). Princeton Architectural Press. https://marywoodthesisresearch.files.wordpress.com/2014/03/berger_drosscape.pdf

Clément, G. (2003) The "Manifeste du Tiers-Paysage", Editions Sujet/Objet http://www.gillesclement.com/art-454-tit-The-Third-Landscape

Casagrande, M. (2013). From Urban Acupuncture to the Third Generation City. Research Gate. https://www.researchgate.net/publication/309741134_From_Urban_Acupuncture_to_the_Third_Generation_City

Davies, E. & TEDxAlgonquinPark. (2013, December 19). Restoring Urban Wilderness: Eric Davies at TEDxAlgonquinPark. Youtube. https://www.youtube.com/watch?v=K9205yeBL60

De Ceuvel & DELVA Landscape Architects. (n.d.). Sustainability. De Ceuvel. https://deceuvel.nl/en/about/sustainable-technology/

Fahmy, A., Abdou, A., & Ghoneem, M. (2019). Regenerative Architecture as a Paradigm for Enhancing the Urban Environment. Port-Said Engineering Research Journal, 23(2), 11–19. https://doi.org/10.21608/pserj.2019.49554

Grant, S. W. (2013). Gardens Are a Physical Manifestation of Culture: Postmodern Public Parks of the Twenty-First Century Will Be Built on the Infrastructure of the Industrial Age. https://scholarship.rollins.edu/cgi/viewcontent.cgi?article=1038&context=mls

Institute for European Environmental Policy. (2014). The Health and Social Benefits of Nature and Biodiversity Protection.

John Dixon Hunt (2000), Greater Perfections: the Practice of Garden Theory, ISBN-0-8122-3506-1, Philadelphia: University of Pennsylvania Press

Michael Hall, C. M. H. (2013, May). The Ecological and Environmental Significance of Urban Wastelands and Drosscapes. Research Gate. https://www.researchgate.net/publication/299781286_The_Ecological_and_Environmental_Significance_of_Urban_Wastelands_and_Drosscapes

Pawlyn, M. (2019). What is regenerative architecture? The RIBA Journal. https://www.ribaj.com/intelligence/climate-change-emergency-regenerative-design-michael-pawlyn

Pollan, M. (2003). Second Nature: A Gardener's Education. Grove Press.

Regenesis Group. (2015, February 25). What's the difference between regeneration and restoration? https://regenesisgroup.com/regeneration-vs-restoration

Telbott, T. (2019). Co-creation with Animals | 2019 ASLA Student Awards. Oregon University. https://www.asla.org/2019studentawards/679945_Cocreation_With_Animals.html

The Hastings Center. (2018, May 11). Environment, Ethics, and Human Health. https://www.thehastingscenter.org/briefingbook/environmental-health/

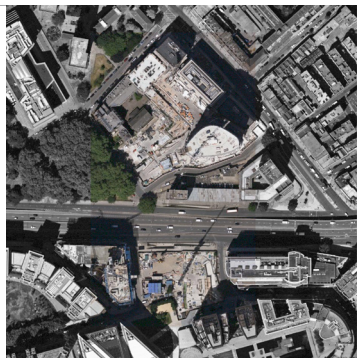
List of figures

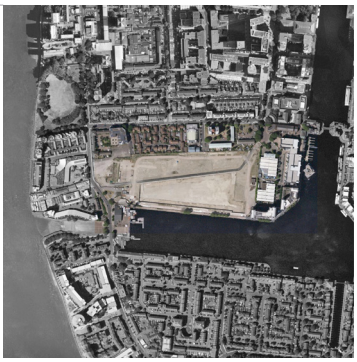
Figure 1
Bakshi, A., & Gallagher, F. (2020). The undeveloped brownfield section of Liberty State Park [Photograph]. http://gallaghergreen.com/Design%20Fourth%20Nature.pdf

Figure 2
Reed, B. (2007). Regenerative Thinking [Diagram]. https://www.circulardesignguide.com/post/circular-cardsDiagram].

10. Appendix Research Paper

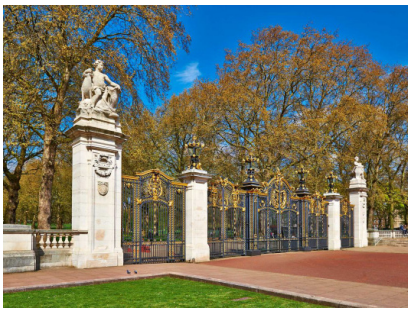
Appendix 1.
Questioning current brownfield development
[own study]

Battersea			Expensive housing/ commercial Select target group non-community based non-environmental focus	X
St. Pancras			Expensive housing Select target group non-community based non-environmental focus	X
Imperial st.			Expensive housing Select target group non-community based non-environmental focus	X
Merchant square			Expensive housing Select target group non-community based non-environmental focus	X

Westferry printworks			Expensive housing Select target group non-community based non-environmental focus	✗
Cromwell			Expensive housing Select target group non-community based non-environmental focus	✗
Trinity Buoy Wharf			Artist/entrepreneur hub accessible for public community based opportunity-full affordable non-environmental focus	✓
Earls Court			Undeveloped community answer due to protest for expensive development, for ten years this development failed. The community uses it for community needs and demand a community based development.	✓

Appendix 2.
Questioning nature in London - site investigation
[own study]

Appearance



ACCESSIBILITY

The majority of the parks in London are fenced, only accessible during opening hours, related to sunset. When dark, the parks close down and are not accessible anymore. **The majority of London is restrained from access to nature during 50% of the day.**

WILDLIFE

Even though one could argument that wildlife adjust to the urban life, for many species it's not their preferable habitat to thrive. The urban environment knows a wide variety of species, but also endangers many. Bats, bees and butterflies are examples of species that do not thrive in an environment where nature has this Anthropocentric focus and are pushed out. Wildlife is a secondary importance.

BOUNDARY

The majority of the parks in London are fenced, which creates a clear and harsh border between nature and its surroundings. **The park is inaccessible from the majority of this border.** It could be re-imagined to be a more fluid and accessible boundary between nature and the city.

CONDITION

The major problem of nature in the urban environment is the condition of it: fully controlled for the pleasure of human. This Anthropocentric focus is the base of the problem. It reflects the downfall of biodiversity in the urban environment by degrading nature for human pleasure.

CONDITION

The controlled nature lacks sufficient quality to let biodiversity thrive. Wildlands can full-fill this need.

ECOCENTRIC AWARENESS

Even though most nature has the Anthropocentric, controlled focus, there are some examples where the awareness of the importance of Ecocentric nature is present. Activists trying make the public aware, some natural areas consisting of uncontrolled nature for the retrieving of it and authorities pressing their concerns about wildlife. The bracket of applications however is concernedly small.

Usage

COMMEMORATION

Noticeable is that many parks are used for commemorative ends. The tranquillity nature provides can be an explanation.

LEISURE

The main usage of parks and nature by human in the city is by an act of leisure. This is where most of them are designed for. Enjoying the weather, meeting up with friends or walking the dog. The park is a hotspot for leisure.

SPORTS

Although part of leisure activity, sports are a major usage of parks and nature in the city. This can be explained by as well as the available space as the healthier environment it provides. Parks and nature stimulate healthy lifestyles.

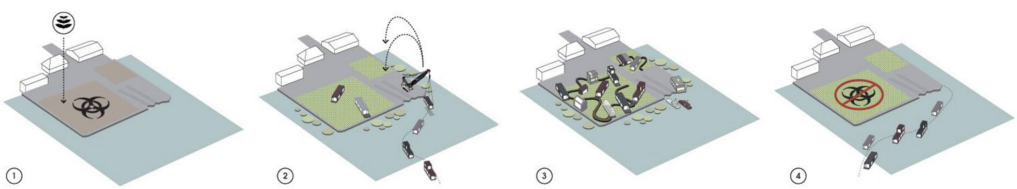
WILDLIFE

Next to the usage of human, many animals use the park as their urban habitat. They adapt to the condition of this nature, as well as to the humans intervening with them. However, this is not their preferable habitat.

CONCLUSION

London as a green urban metropolis has many parks integrated in the urban fabric. This research is therefore not questioning the amount of green space, but the appearance of it. London's parks lack accessibility, have hard boundaries and are fully conditioned for the leisure of man. Biodiversity has not been given a change to thrive in the natural environment of the city. Biodiversity is a secondary importance, while it could be the first. The Anthropocentric focus should shift towards an Ecocentric focus.

Appendix 3.
De Ceuvel - site visit
DELVA Landscape Architects

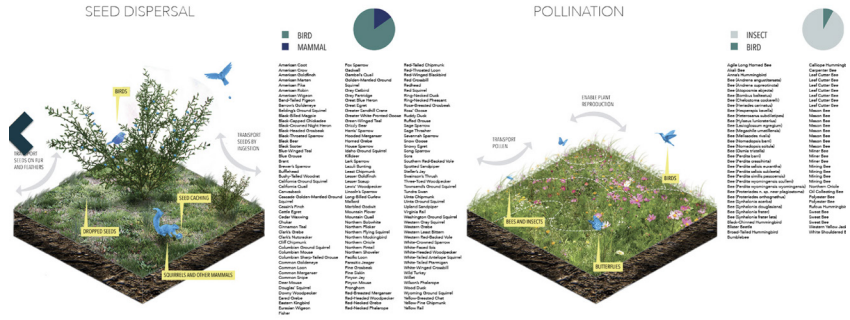


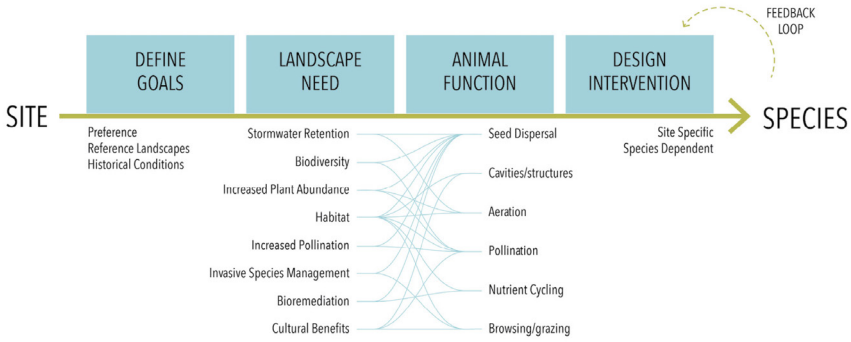
De Ceuvel is an example of brownfield development aiming to fix society mistakes by retrieving nature, while simultaneously focusing on a community development:

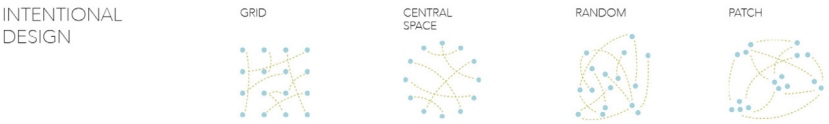
The area of De Ceuvel has been highly polluted by heavy industry over the last century. Therefore DELVA Landscape Architects introduces the 'Forbidden Garden', consisting of hyper accumulative plants that have the ability to absorb contaminants through their roots. The cultivation of the land results in the retrieving of nature with a specific set of plants which absorbs, stabilize or exhaust high concentration of pollution.
Since this ecological process of remediation has only been limitedly applied in practice, the project aims to increase the knowledge of this technique in order to improve it. Due to this learning process, the way of maintaining and cultivating the garden shifts and develops over time. It enhances the spontaneously vegetation ('Fourth Nature') and carefully examen their use for remediating the soil. Simultaneously it also keeps sowing plants that are already known or suspected for the purifying qualities. Updating the garden and enhancing the spontaneously seems to work most beneficial.
While the landscape can be seen as the ecological construction yard, the development simultaneously embraces the community by initiating a sustainable community playground in the remediating landscape. The plot hosts creative workspaces, a cultural venue, a sustainable café, spaces to rent, and a floating bed & breakfast while generating an urban oasis. To protect both nature, the human built is lifted and connected on pathways, creating a physical disconnection between nature & human, while still experience nature in the surroundings.
This award winning, sustainable & ecological brownfield development is unique in Europe, and is suggestive to be used on larger scale.
[De Ceuvel & DELVA Landscape Architects. (n.d.)]

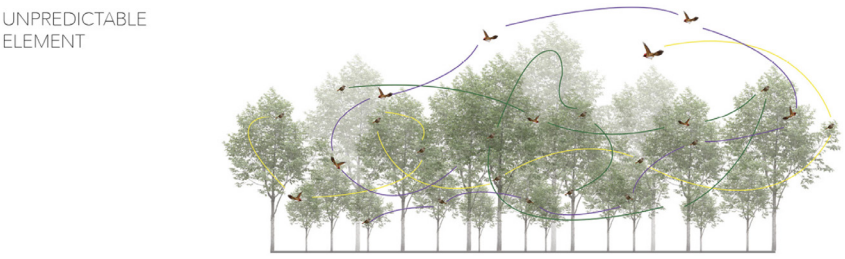
Precedent to concept design
- The remediating garden as ecological construction yard for retrieving nature & regenerate brownfields
- (Temporarily) community based development, responsive to the timeline of the ecological construction yard.
- Treating the remediating garden as the 'Forbidden garden'
- The existing landscape is defining the design of the new landscape. The process of remediating is leading for the timeline of the development.
- Contribute to & stimulate the research process of remediating.

Appendix 4.
Co-creation with animals
Tori Telbott - Oregon University









ASLA Award wining project, 'Co-creation with animal' explores the potential for designers to co-create underperforming landscapes with animals, in order to restore the ecological function. With Co-creation, animals participate in the design process in ways that are collaborative, efficient and functional. It can stimulate functions as pollination, seed dispersal, constructing habitat & nutrient cycles.

Due to the aim for ecological restoration by animals functions, This approach is more complicated than creating *for* animal. It enhances the possibilities of animals dispersing seeds & pollinating species, creating habitat for animals and restore the ecological function by stimulating new species to disperse over the landscape. As the project suggests, attracting those animals is key in restoring biodiversity and aim for the unexpected.
[Telbott, 2019]

Precedent to concept design
- For the restoration of biodiversity, the landscape need to attract pollinators & seed spreaders from the surrounding natural organism.
- Choosing the relevant landscape applicants can attract those animals, creating habitat for them, while they bring in new species. This is necessary with the aim for the wild garden.

CHAPTER 2

Site of investigation

Relevance of site

For the approach to be proven, any brownfield in an urban setting is sufficient as potential example. However, to prove the approach, one site is chosen as a case-study within the city of London. Therefore, the research aims to identify a selection of the most opportunity full sites, i.e. the problematic sites in the problematic areas, as this is where 'restoring' the natural as well as the social environment is most necessary. To identify these potential sites, several lenses are applied.

Lens 1.
industral re-location

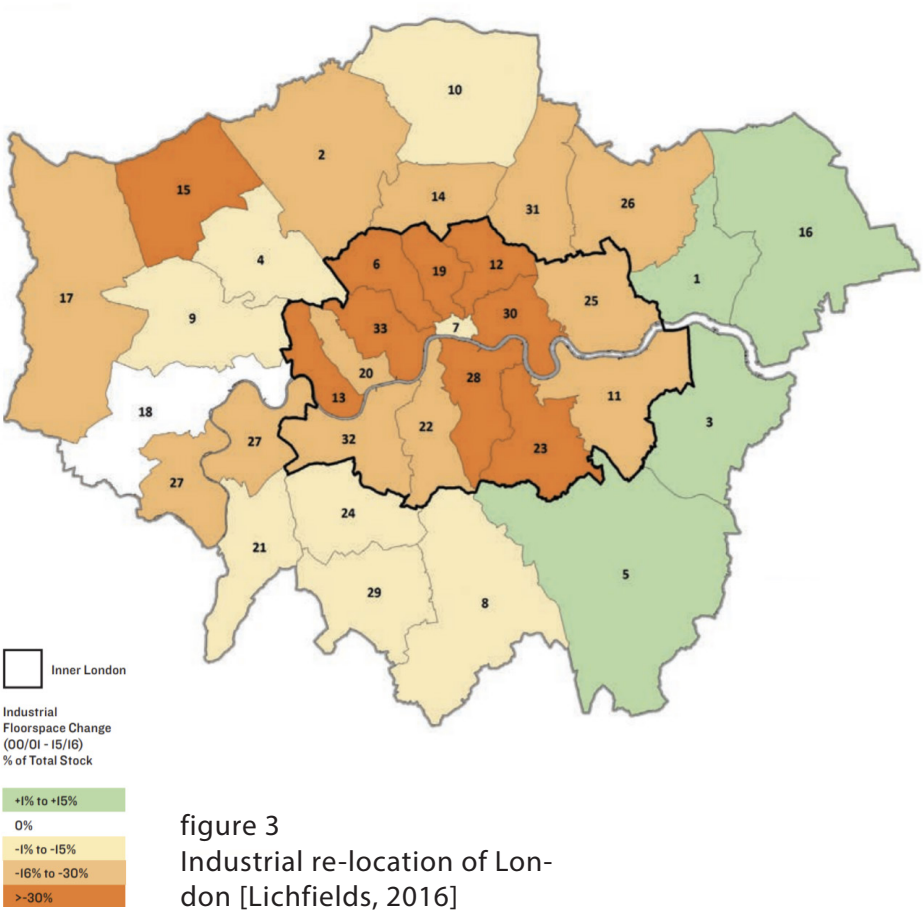


figure 3
Industrial re-location of London [Lichfields, 2016]

London as a post-industrial city contains many brownfields. The first lens used is to identify where in London most industry is re-located in the past twenty years. This is where likely most brownfields will be located. Illustrated in figure ..., noticeable is that within Inner-London most industry left, pushed out the dense city center towards the eastern part of London. The first lens is Inner-London

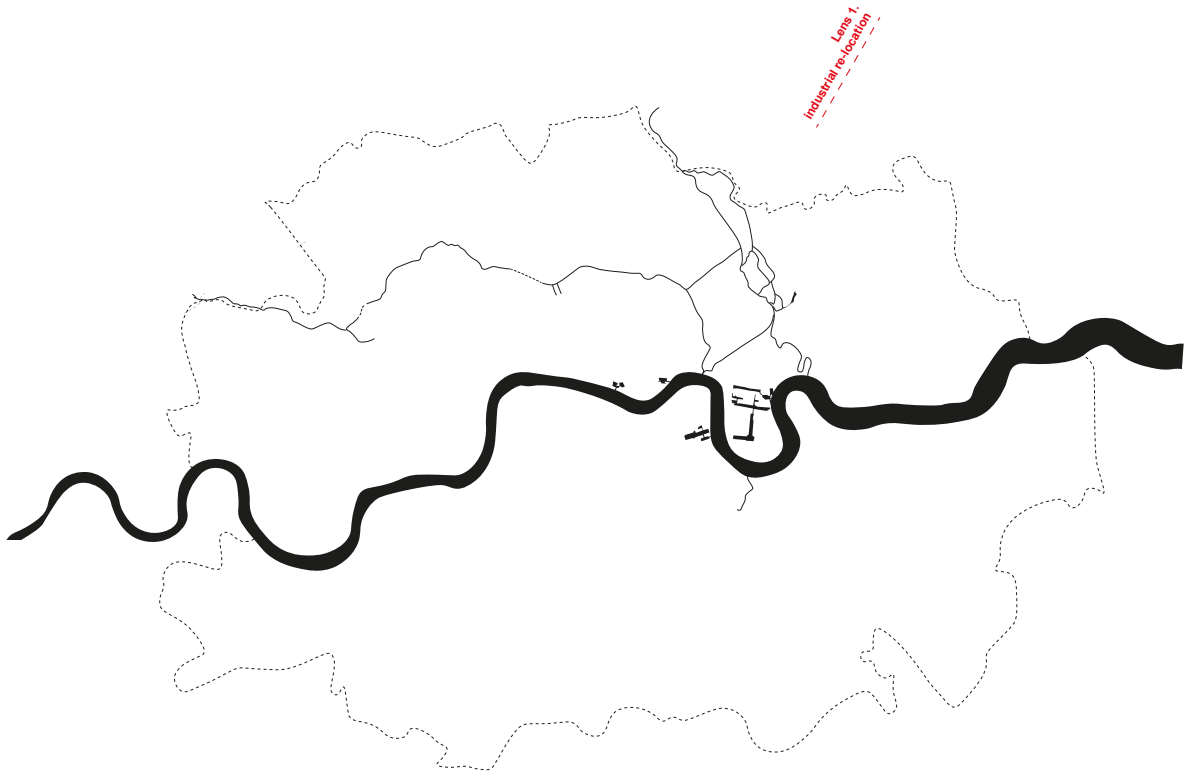


figure 4
Inner london [own image]

Lens 2.
socio- environmental deprived areas

The strategy aims to restore the natural environment, but simultaneously adress the social environment. Therefore the second lens is the socio- environmental deprived areas, as this is where both are most problematic in London. GIS data of the London Government is used to identify the most deprived areas on the level of the wards. The data is layered, resulting in figure ... The grey areas highlighted in figure ... are the most deprived areas.

the index of social environmental deprived areas

Social
- Income deprivation,
- Employment and education deprivation
- Health deprivation and disability
- Housing and services accessibility
- Crime
- Living environment deprivation

Environmental
- Air pollution
- Green space deprivation
- Flood risk
- Temperature

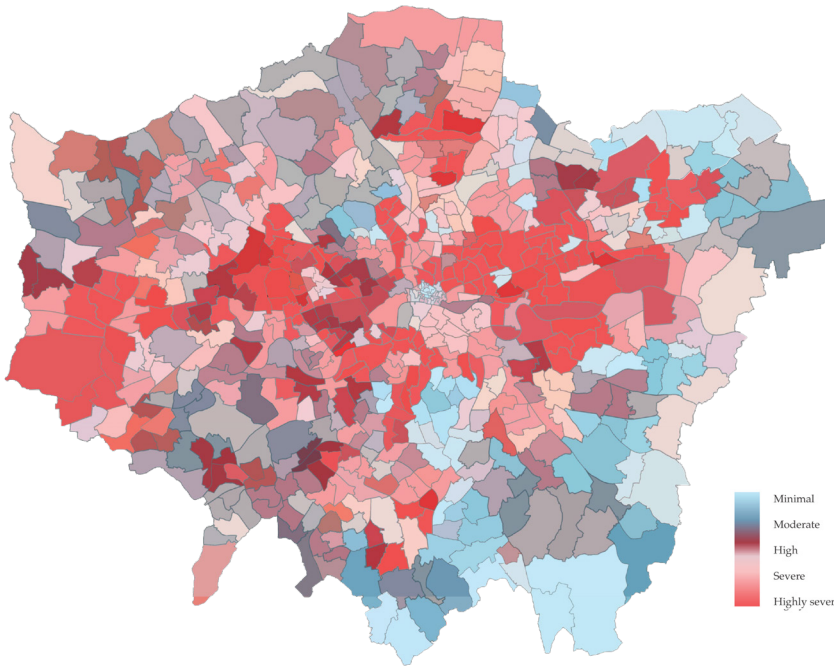


figure 5
GIS data map: socio-natural environmental deprived areas [Acosta & Haroon, 2021]
This map highlights where the social environment as well as the natural environment is vulnerable within London, on the scale of the Wards.

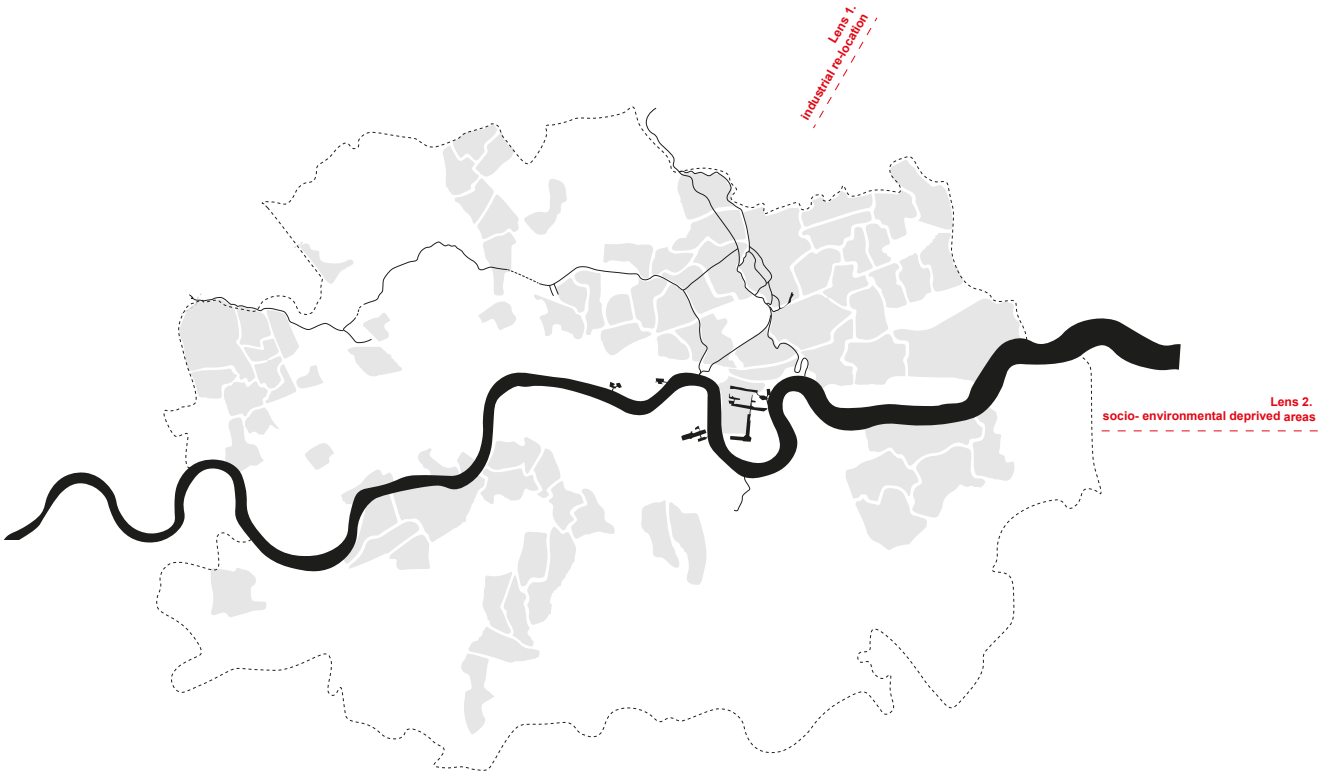


figure 6.
Lens 2. Social-environmental deprived areas within inner London. [own image]

Lens 3.
nodes of infrastructure

The research aims to identify the brownfields within the deprived areas. Therefore, the research investigates the nodes of the main infrastructure with the brownfield register: the nodes of the waterways, railways and motorways are investigated in combination with the brownfield register, within the deprived areas. Besides, the nodes of infrastructure are scanned for industrial for industrial heritage, as these sites could not yet be registered as brownfield, although in the future will become as such. This result is 28 potential (soon to be) brownfield sites.

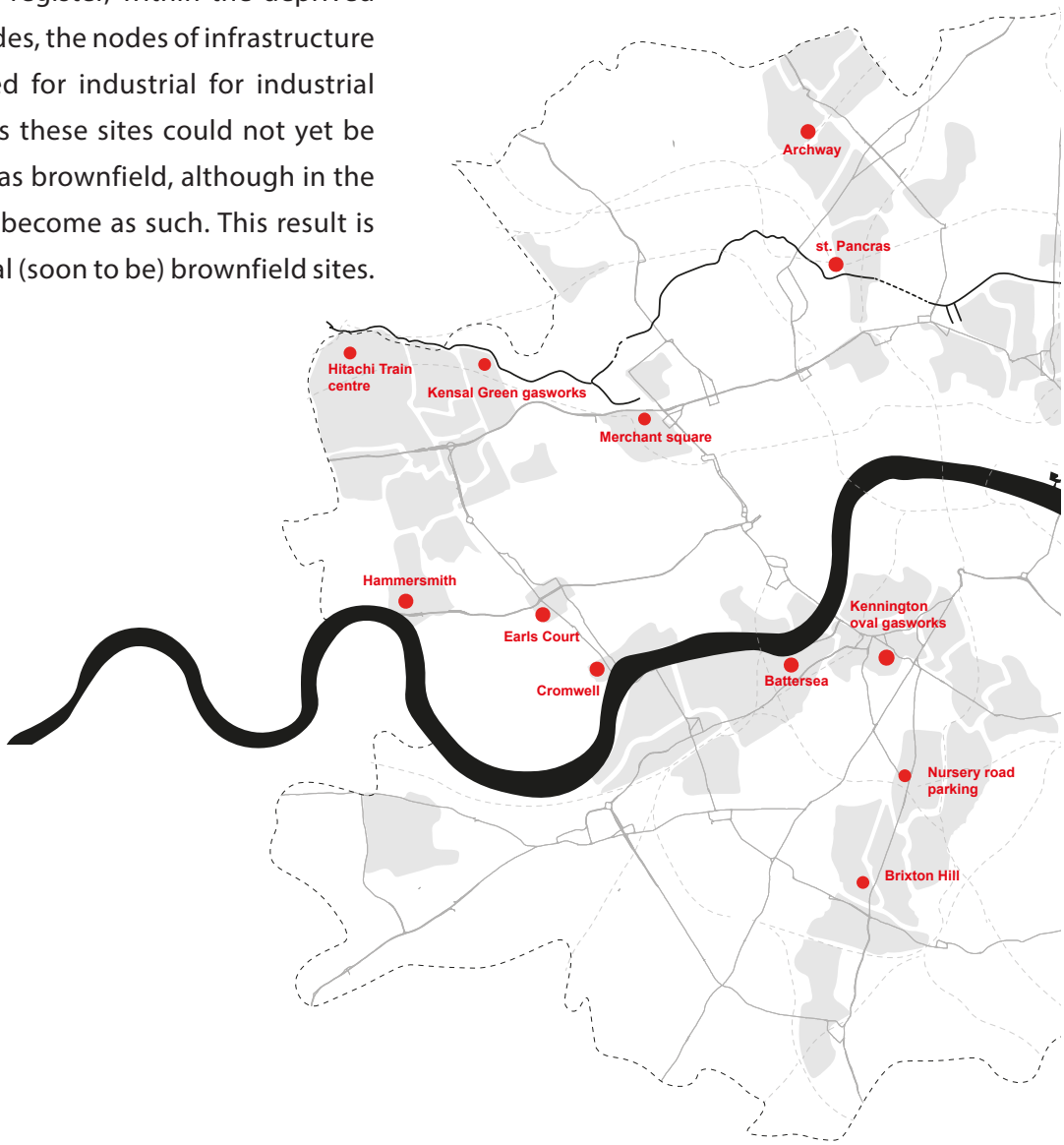
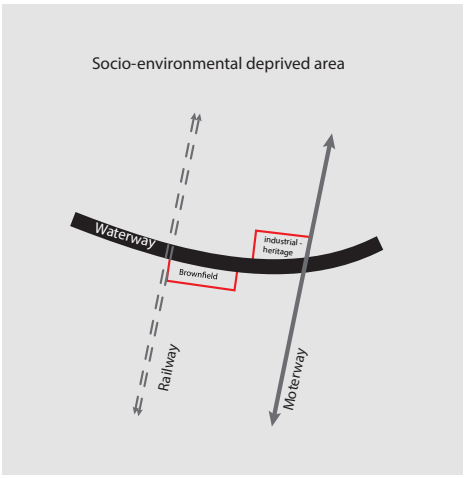


figure 7
Nodes of infrastructure
[own image]



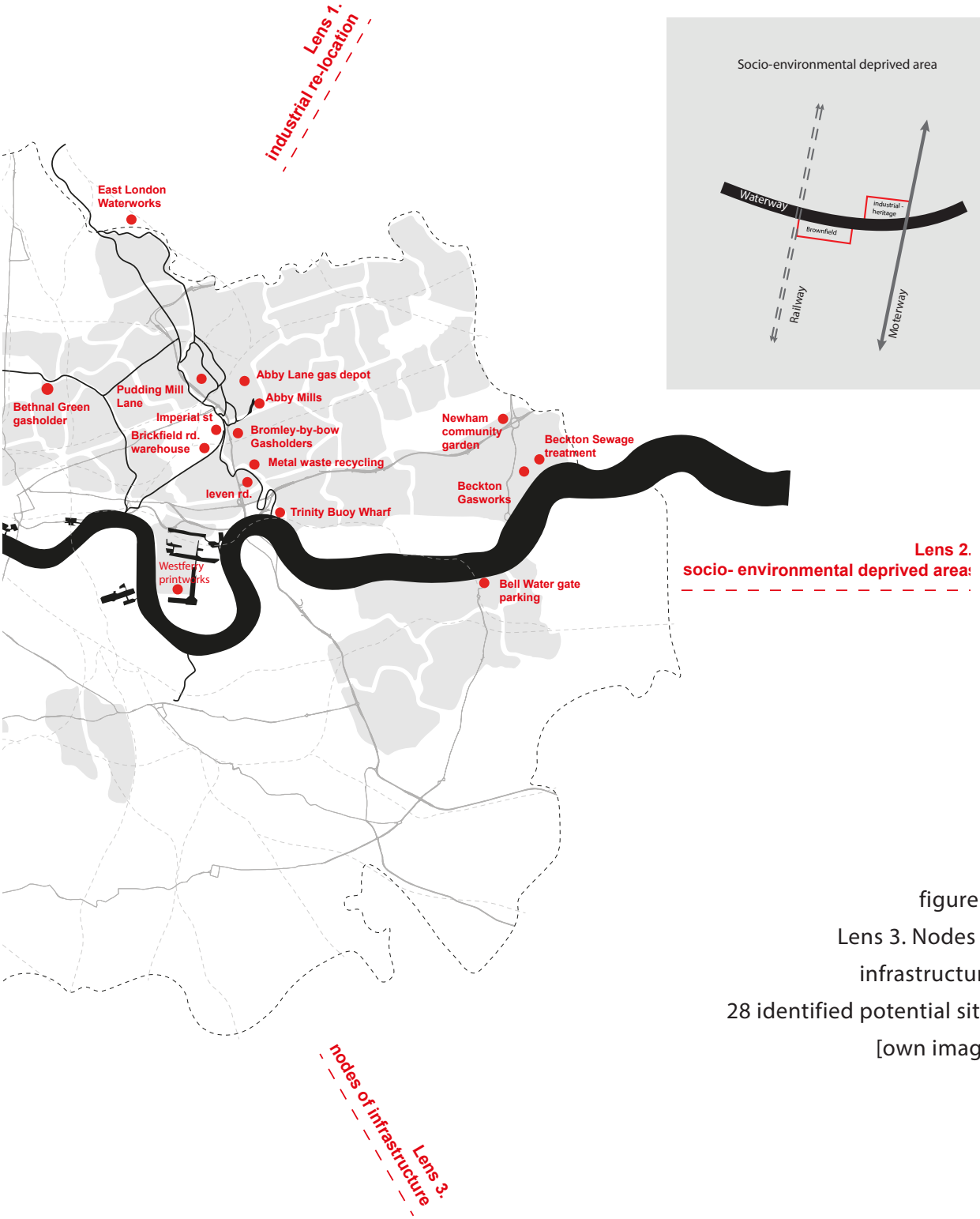
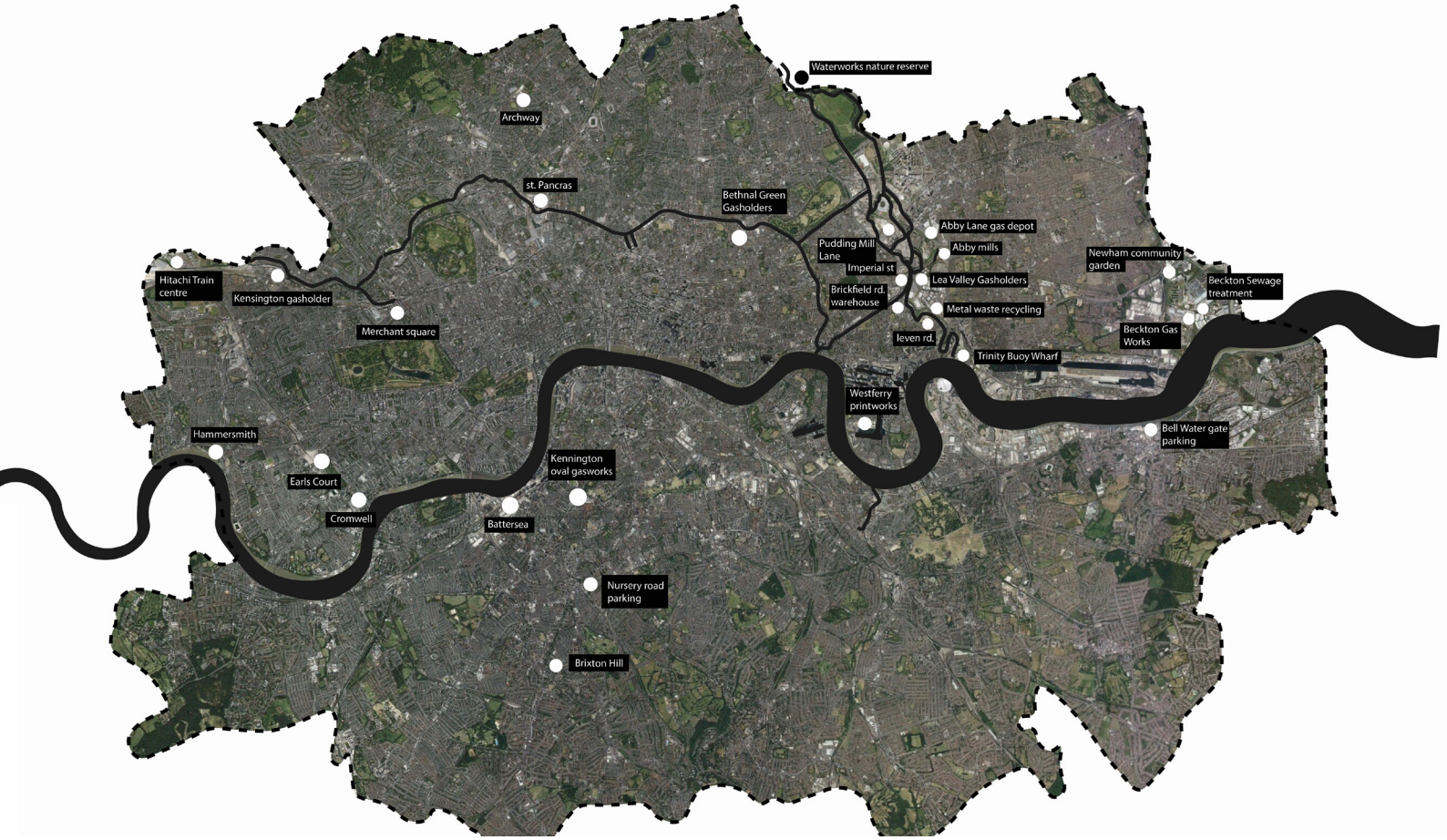


figure 8.
Lens 3. Nodes of infrastructure.
28 identified potential sites
[own image]

Lens 4.
site investigation - cultural heritage

To make a selection of the 28 potential sites, the fourth lens is the first hands-on site investigation. Exposing the sites in aerial images allow us to see them in their context and see their first potential. Since many brownfields are post-industrial and therefore contain industrial heritage, Inflicting this strategy, will inevitably result in dealing with industrial heritage. As any of the sites could be used as an example to prove the strategy, sites with industrial heritage have an extra challenge of turning the heritage object into a regenerative device.
Since all the sites have a common ground in site conditions and the level of deprivation in the adjacent area, the lens of cultural heritage is the fourth filter towards a potential site.

Post-rationalizing, this site investigation should have been focused on the appearance of Fourth nature & the industrial context. Now this lens is applied as the final lens, while conducting it in an earlier stage could have resulted in more potential sites.


Waterworks nature reserve
Archway
st. Pancras
Bethnal Green Gasholders
Abby Lane gas depot
Pudding Mill Lane
Abby mills
Newham community garden
Imperial st
Lea Valley Gasholders
Beckton Sewage treatment
Hitachi Train centre
Kensington gasholder
Brickfield rd. warehouse
Metal waste recycling
Merchant square
leven rd.
Beckton Gas Works
Trinity Buoy Wharf
Westferry printworks
Hammersmith
Bell Water gate parking
Kennington oval gasworks
Earls Court
Cromwell
Battersea
Nursery road parking
Brixton Hill

[own image]

cultural heritage

Kensington
gasholder

Archway

Hitachi train center

Hammersmith

St. Pancras

Merchantsquare

Cromwell

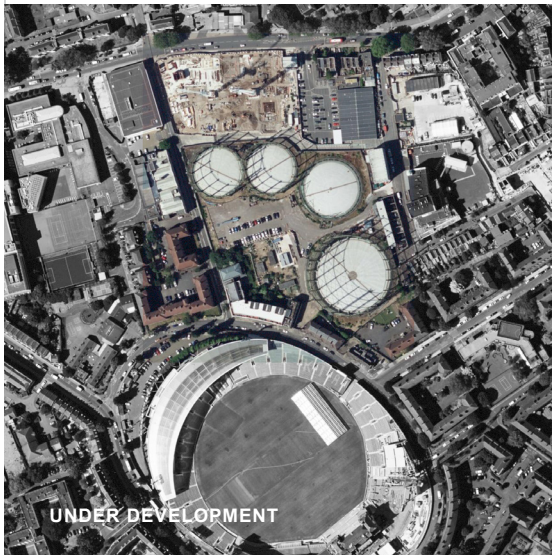
Earls court

Source: Apple maps.

Battersea

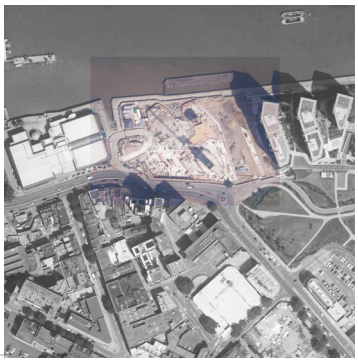
Kenningtonoval

gasworks



Bellwater gate

parking



Becktongasworks

Nursery road

parking

Brixtonhill

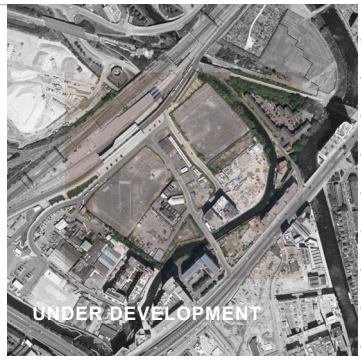
Newham community

garden

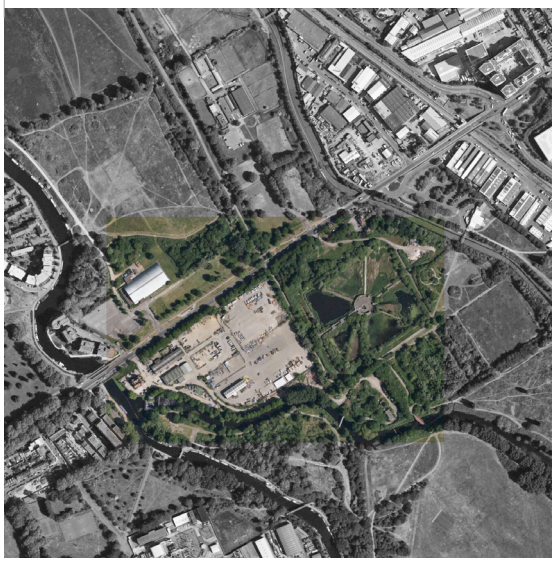
Beckton sewage

treatment

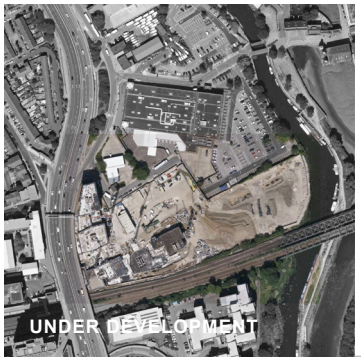
Pudding Mill lane



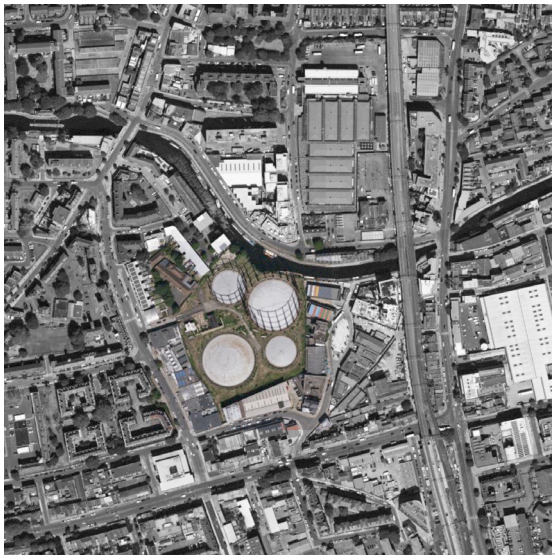
Waterworksnature reserve



Abby Mills



Imperial st.



Bethnal Green gasholders

bromley-by-bow
gasholders

Abby Lane gas
depot

Leven rd.

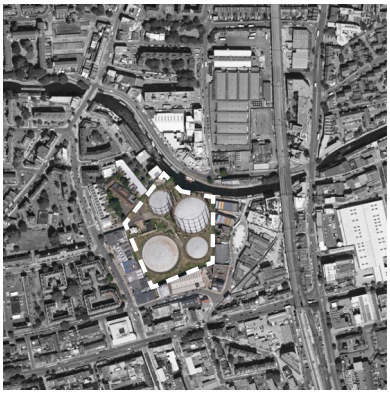
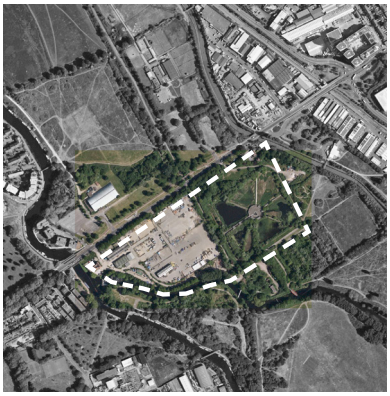
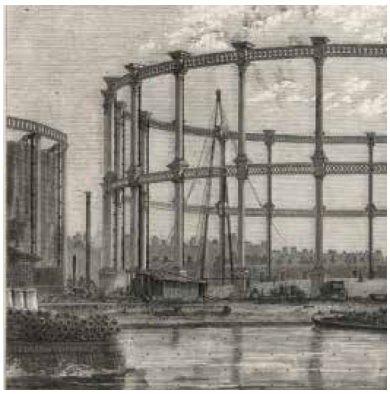
Brickfield rd.
warehouses

Metal waste
recycling

Trinity Buoy
Wharf

Westferry
printworks

remaining sites - catalogue

	BETHNAL GREEN GASHOLDERS	EAST LONDON WATERWORKS	KENSAL GREEN GASWORKS
SITE			
HERITAGE			
HISTORY			
	The Bethnal Green Gasholders, built in 1860, was used to store and distribute gas to many houses in east London. Due to the technological advances in gas infrastructure, most of the sites use is redundant, which leaves only a small part of the site still operational. Nowadays, this underused site is situated in the middle of a vibrant neighbourhood, home to a mix of businesses, residents & community spaces, waiting to be reconnected with the latter. The remaining Victorian structures are still a significant landmark in the area.	Due to the cholera epidemics, the East London Waterworks Company started initiating Filter beds & Waterworks in 1852. The current brownfield is part of this East London Waterworks park which provided clean water for London until it stopped operating in 1970. In 1980 the site was cut off from the site which stopped operating and were initiated to re-wild. Today it household the maintenance depot of the Thames Waterworks but is mainly used as storage. Although the filter beds are gone, the old Victorian Engineering House, Sheds and Turbine House are well preserved.	Bound to the Grand Union Canal & the Great Western Railway, the Kensal Gaswork where constructed in 1845 to provided gas for St Pancras, Marylebone, Bloomsbury, Hampstead, Paddington and Chelsea. The gasworks got redundant in 1970, due to the technological changes of underground gas storage. The closure the gaswork made the site partly opened to the public. The remaining is still used for industrial ends. Many of the Victorian gasholders & warehouse structures got redundant, why until today only 2 remain, also planned for demolition.

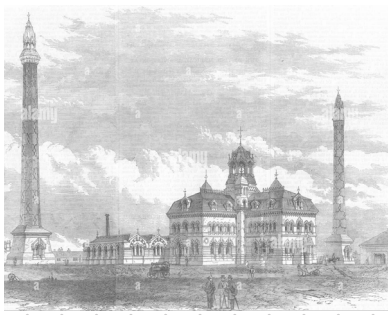
BECKTON GASWORKS

On the north bank of the Thames, Beckton Gasworks was the largest gasworks in Europe, built to manufacture coal gas. It was operational from 1870 to 1976 until most industry left. Some of the victorian Gasholder structures and later on built warehouses still remain and make the site a popular movie location. The community can not enter this site due to the current low-level of industry still operating, though the toxic heap of spoil west of the site, ironically baptised as the Beckton Alps, is transformed to a dry ski slope for the community.

BROMLEY-BY-BOW GASHOLDERS

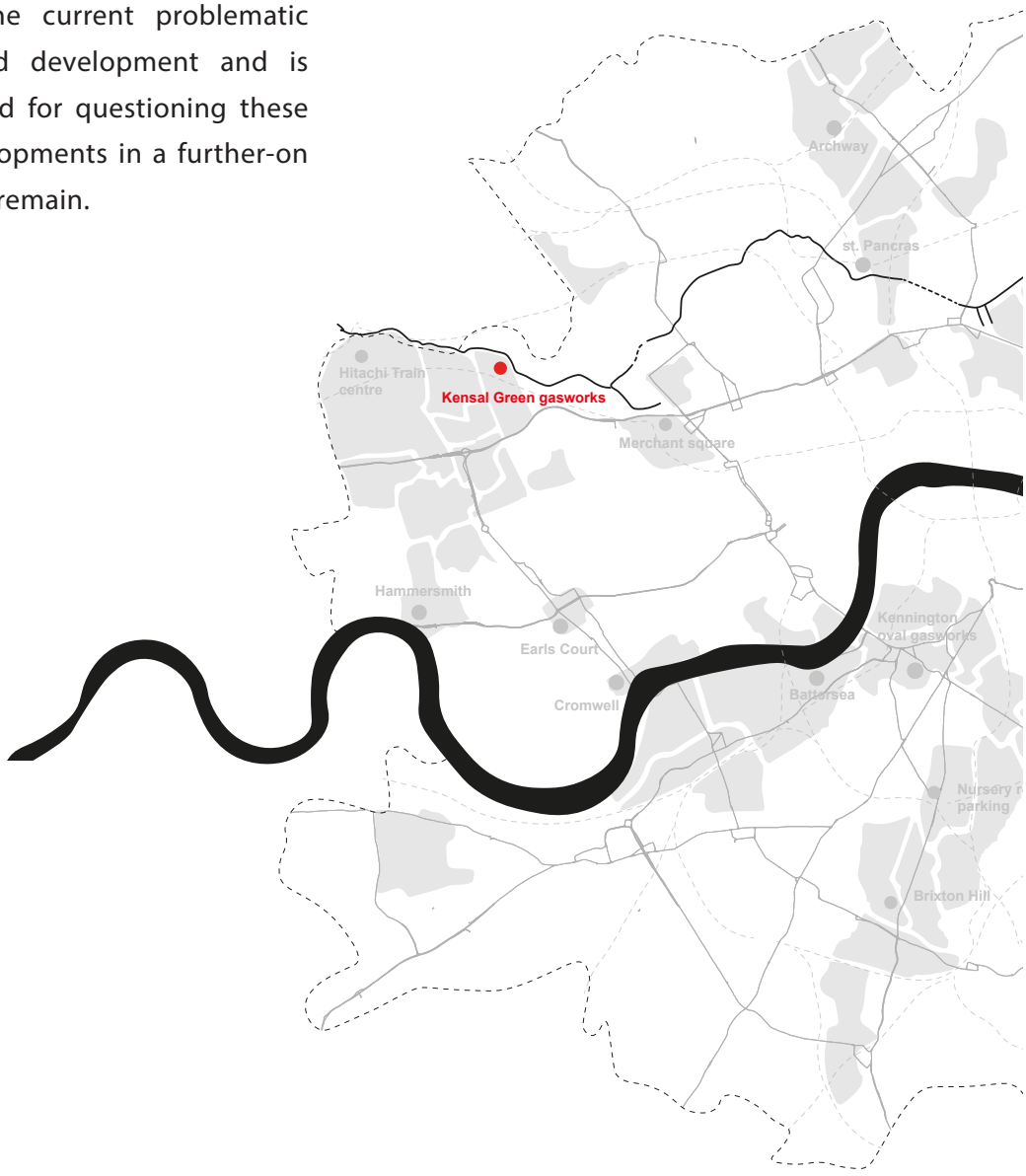
In Bromley-By-Bow, the 7 Victorian gasholders, built in 1870, proudly occupy the large area of land on Bow Creek. They were fully operational until the 1960's until due to the technological advances in gas infrastructure their purpose got redundant. Today it only still stores natural gasses. Recently, the structures were named within the ten most endangered buildings of the Victorian ear. Today, seven of the eight structures still remain.

ABBY MILLS



Abby Mills, proudly called the cathedral of sewage, is a sewage pumping station built in 1868 in Byzantine style, used to raise the sewage in the London sewerage system. Today, 200 meters south, a modern pumping station has been built. Abby Mills is now only moderately assisting the latter. Besides the towers, The Building is well maintained as the function and heritage value was significant. Though occasionally open for visits, it is not open to the community. Due to the abundant function and status, the site has the quality to be transformed into a historical community hub.

Post-analysing revealed the cultural heritage potential of the 28 sites, meaning the larger the image the more potential the site. Post-analysing simultaneously revealed sites already under development. This reveals insight in the current problematic of brownfield development and is therefore used for questioning these kind of developments in a further-on stage. 6 Sites remain.



Lens 4.
site investigation:
cultural heritage

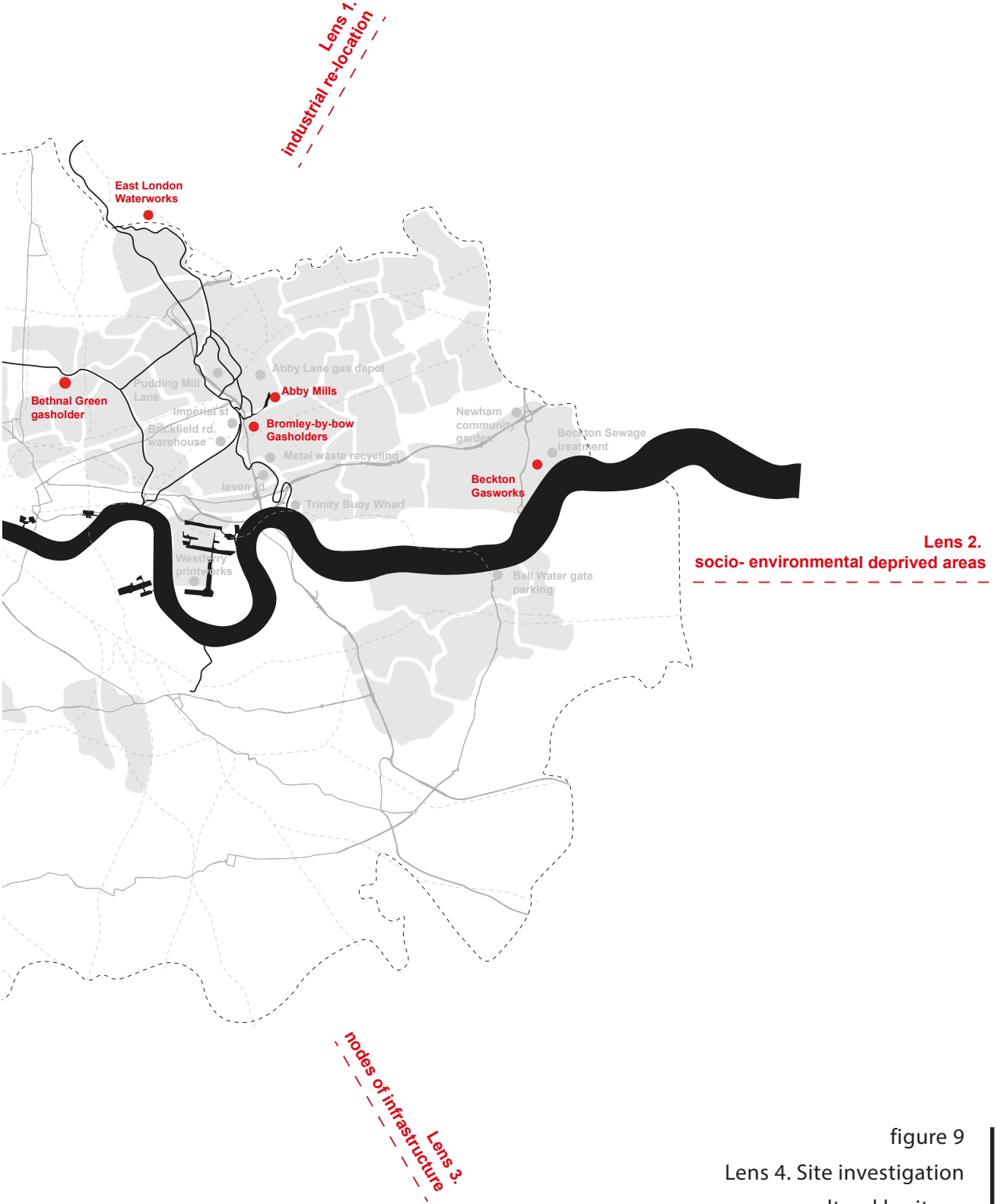


figure 9
Lens 4. Site investigation
-cultural heritage
6 remaining potential sites [own image]

Lens 5.
Site analysis - potential occupancy

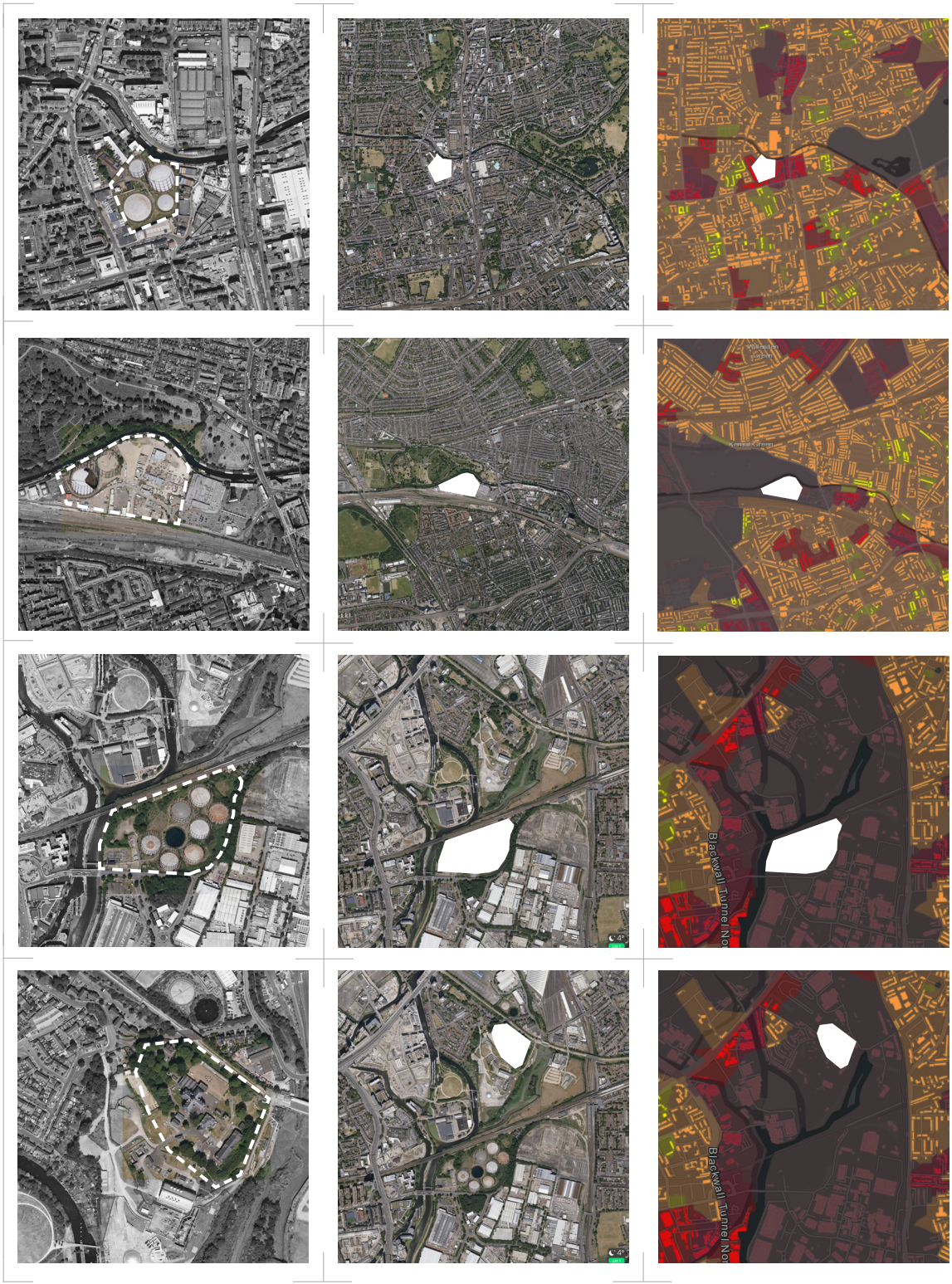
SITE | AREA OF INVESTIGATION | POPULATION DENSITY

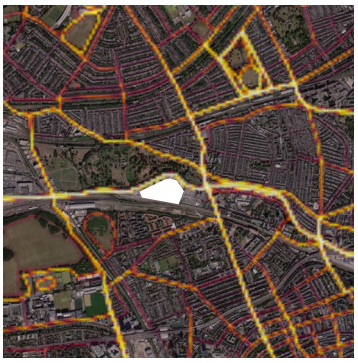
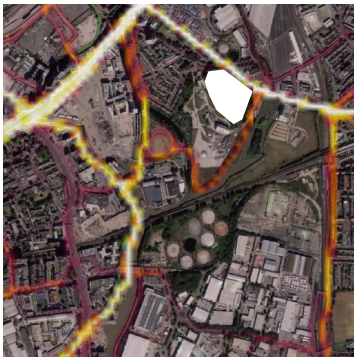
BETHNAL GREEN GASHOLDERS

KENSAL GREEN GASWORKS

BROMLEY-BY-BOW GASWORKS

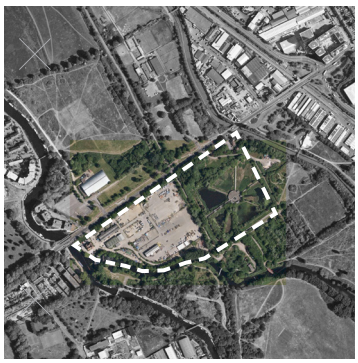
ABBY MILLS



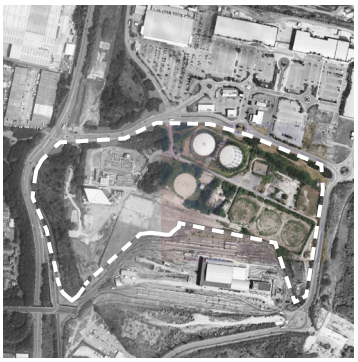
LEISURE AREA	SIZE ON SCALE 1:40.000	RESULT	
		within high dense populated area intensely connected to leisure relatively small though sufficient size **high potential occupancy**	✓
		-within high dense populated area sufficient connected to leisure medium, sufficient site **medium-high potential occupancy**	✗
		within high dense populated area medium connection to leisure -large, site **high potential occupancy**	✓
		within low dense populated area low connection to leisure relatively small though sufficient size **low potential occupancy**	✗

SITE | AREA OF INVESTIGATION | POPULATION DENSITY

EAST LONDON WATERWORKS

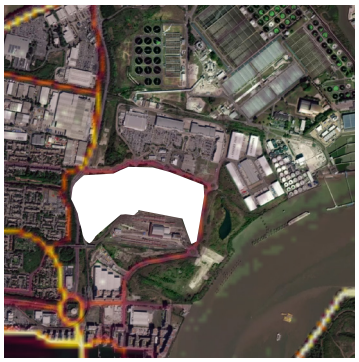


BECKTON GASWORKS



Highest
Very high
High
Low
Very low
Lowest

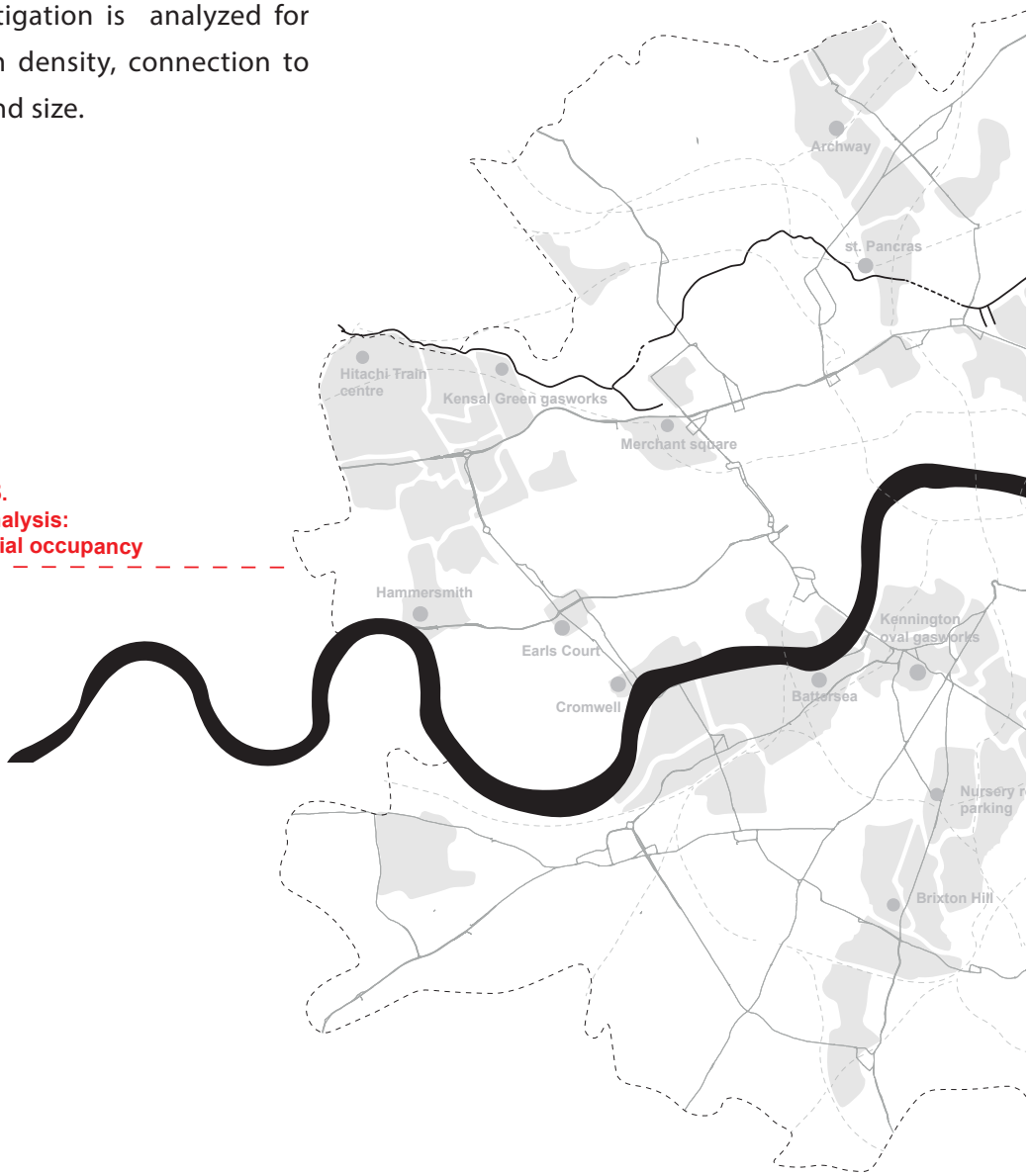
[Arcgis, 2021]

LEISURE AREA	SIZE ON SCALE 1:40.000	RESULT
		in between dense populated area intensely connected to leisure medium size **medium potential occupancy**
		within low dense populated area low connection to leisure large size **low potential occupancy**

[Heatmap Strava, 2021]

It can be concluded that both sites; Bethnal green gasholders & the Bromley-by-bow gasholders are equal in potential occupancy. The first hands-on analysis show that the Bromley-by-bow gasholders are surrounded by a natural, industrial & living environment, where Bethnal Green is enclosed by only living environment. Where Bromley has the advantage in size, Bethnal Green has the advantage in Leisure connection.

Site analysis will filter the remaining sites towards the most potential. The analysis used is the potential occupancy, where more potential is equal to more usage & the larger the site and therefore more effective. The area of investigation is analyzed for its population density, connection to leisure area and size.



Lens 5.
site analysis:
potential occupancy

Lens 4.
site investigation:
cultural heritage

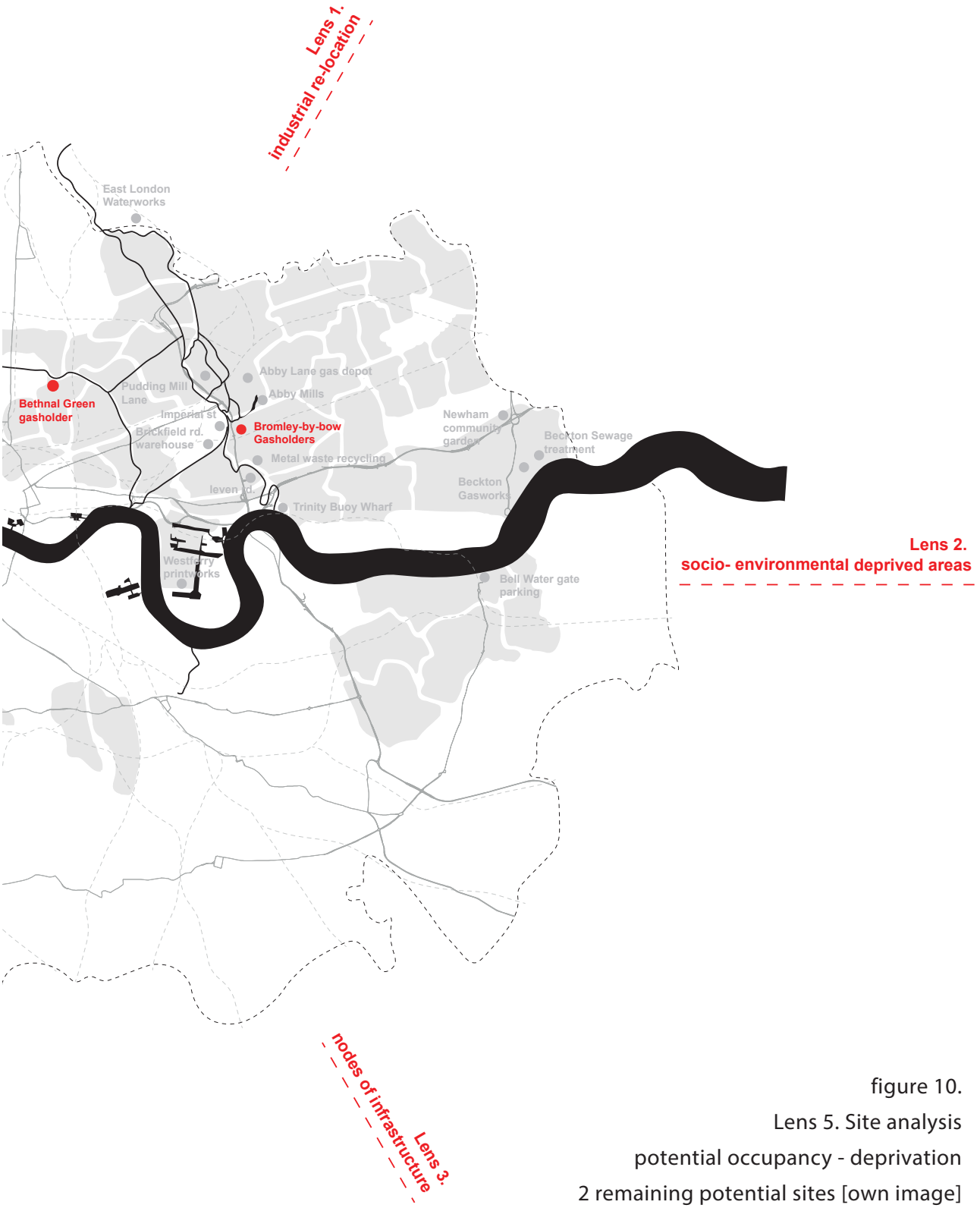


figure 10.
Lens 5. Site analysis
potential occupancy - deprivation
2 remaining potential sites [own image]

Lens 6.1
industrial context

Bethnal Green Gasholders

system on its own

BROMLEY-BY-BOW GASWORKS

Where the Bethnal Green site is isolated from other industry with a relatively small area, the Bromley-By-Bow in the Lea Valley area is a site adjacent to many industrial sites, some of them vacant. The industrial takeover of the Lea Valley has more potential then the isolated plot of Bethnal Green. A vision for the whole Lea Valley can influence the larger urban organism.

system within system

Lens 6.2
natural appearance

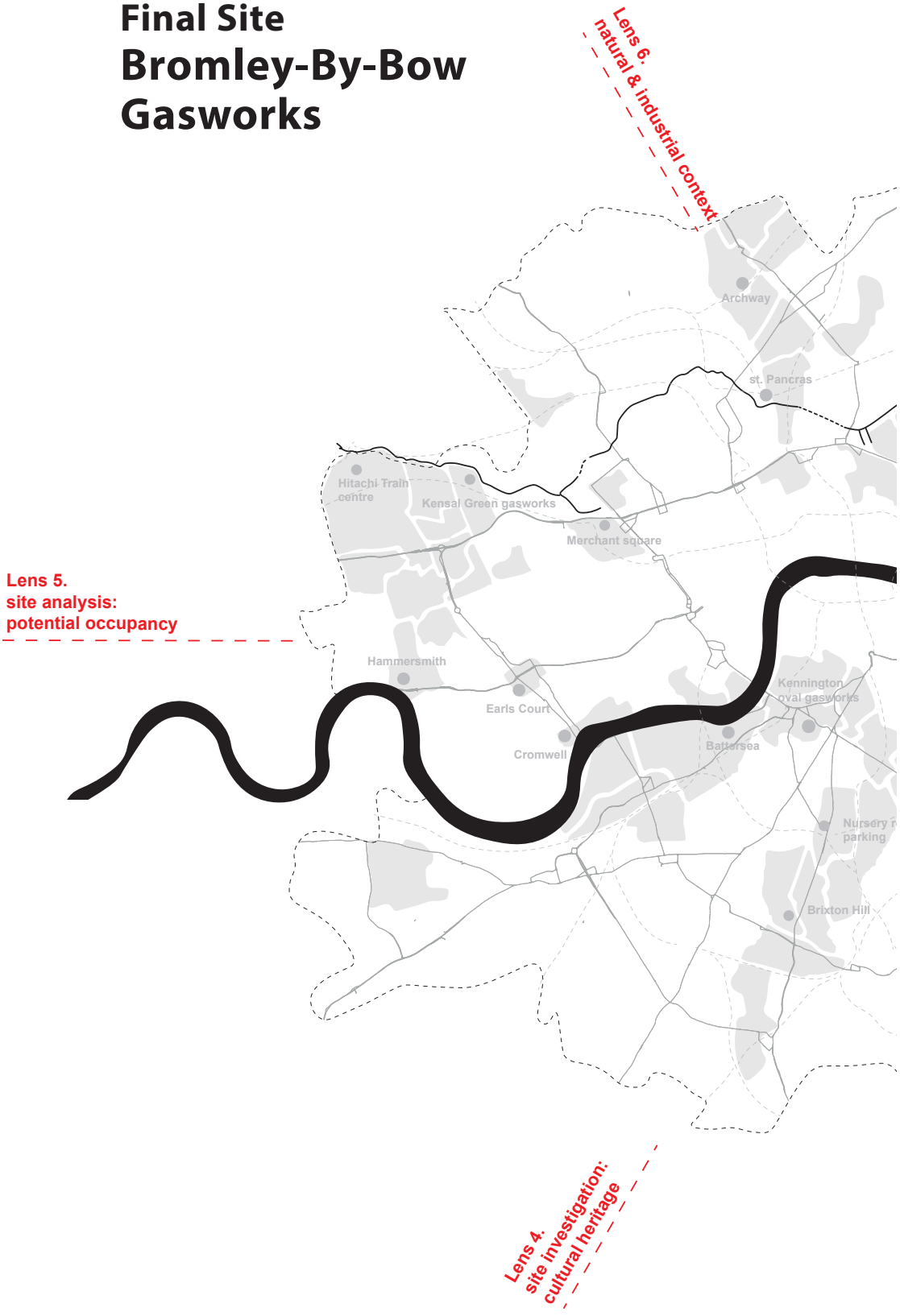
Bethnal Green Gasholders

figure 11.
Aerial Bethnal Green
[Montagu Evans, 2020]

BROMLEY-BY-BOW GASWORKS

figure 12.
Aerial Bromley-By-Bow
[Getty, n.d.]

Final Site
Bromley-By-Bow Gasworks



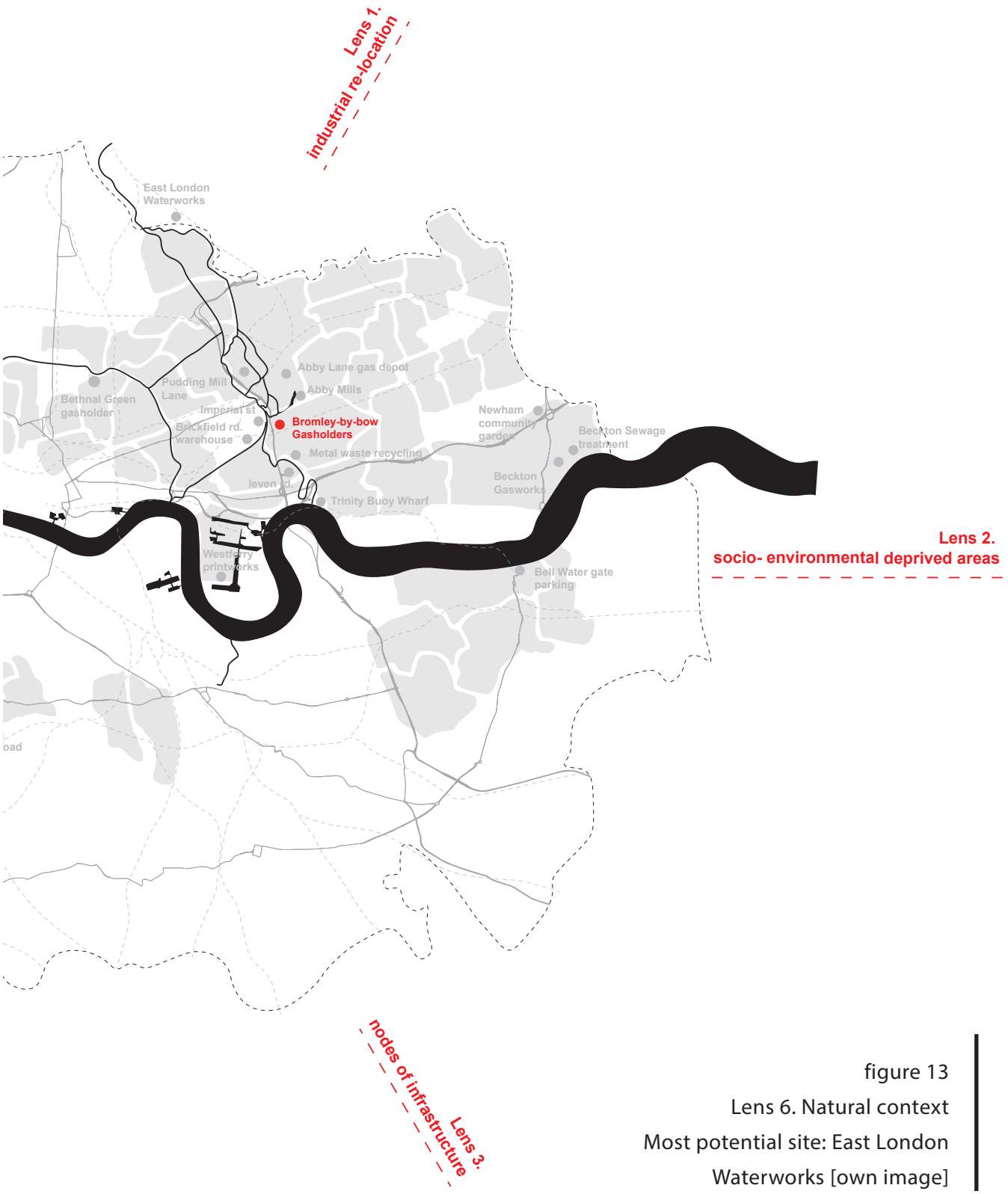
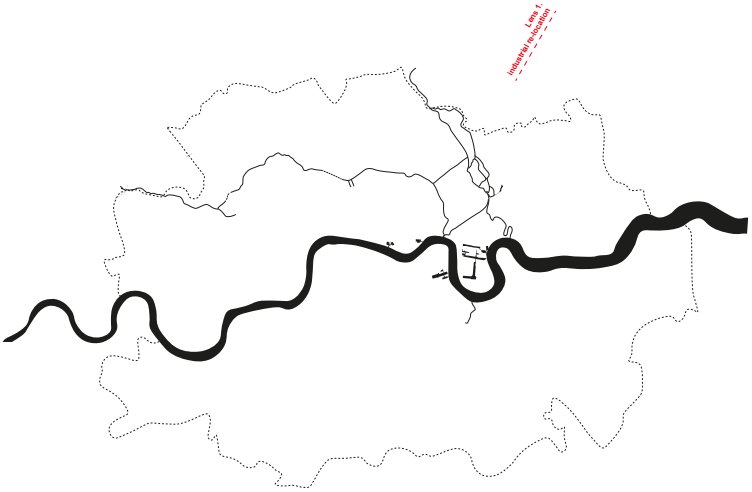
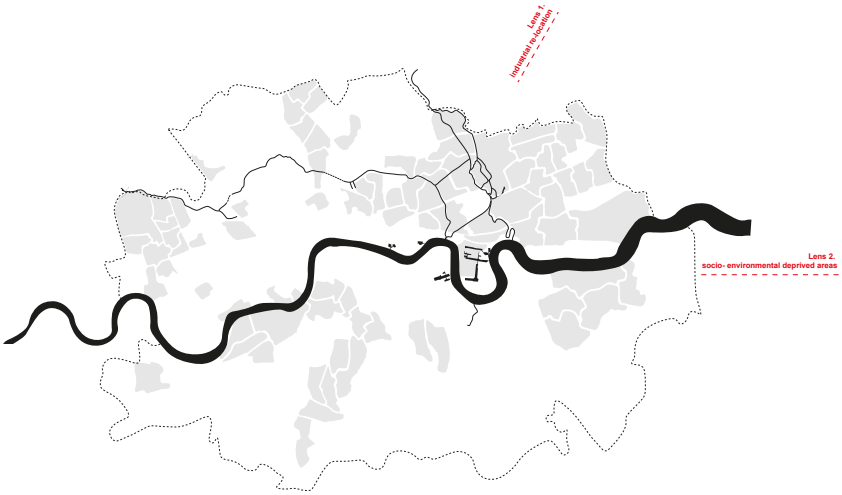
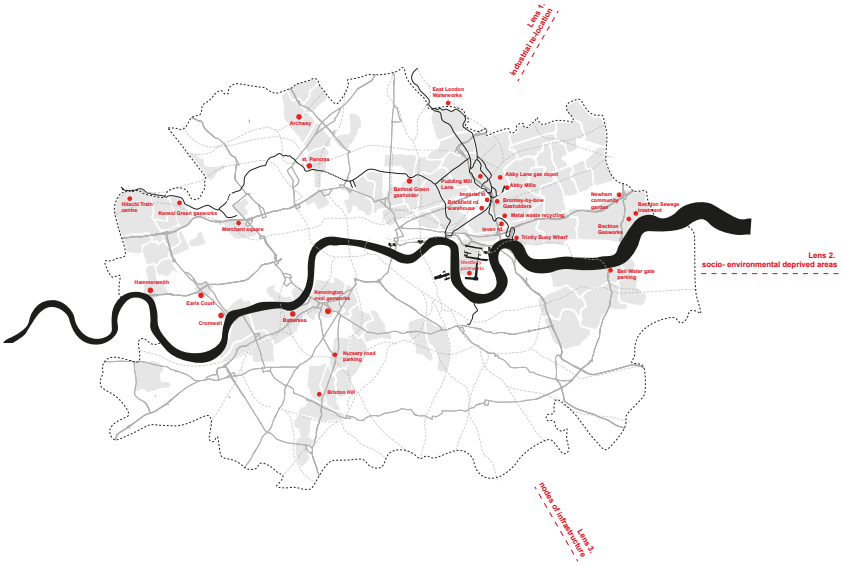


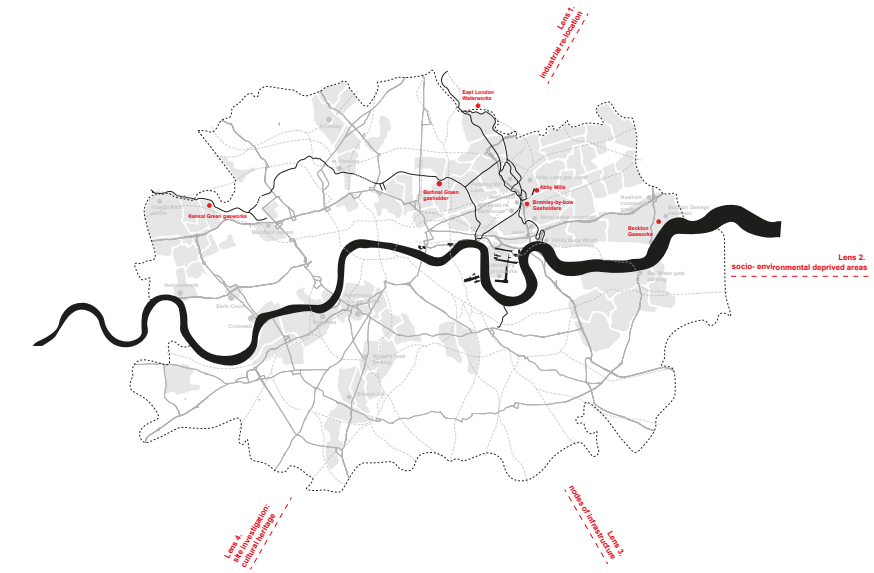
figure 13
Lens 6. Natural context
Most potential site: East London
Waterworks [own image]

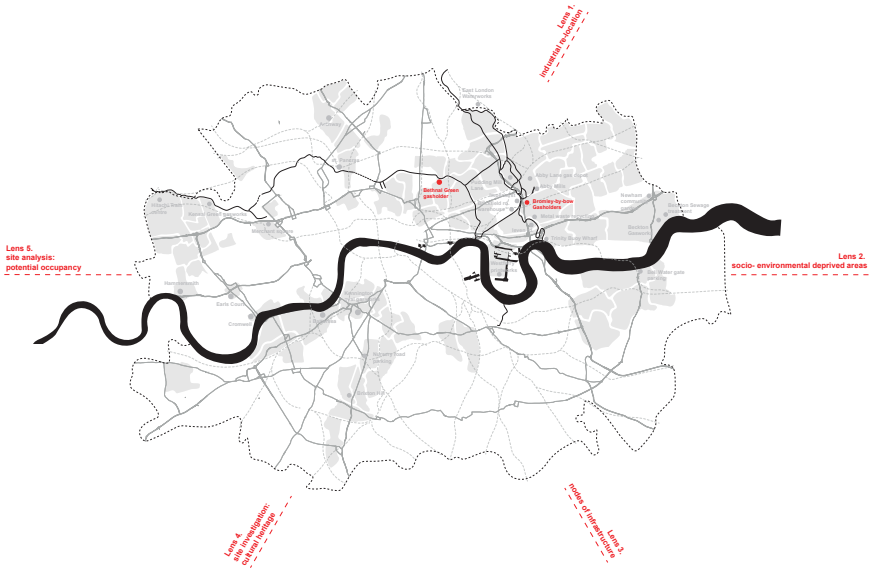
summary filtering selection

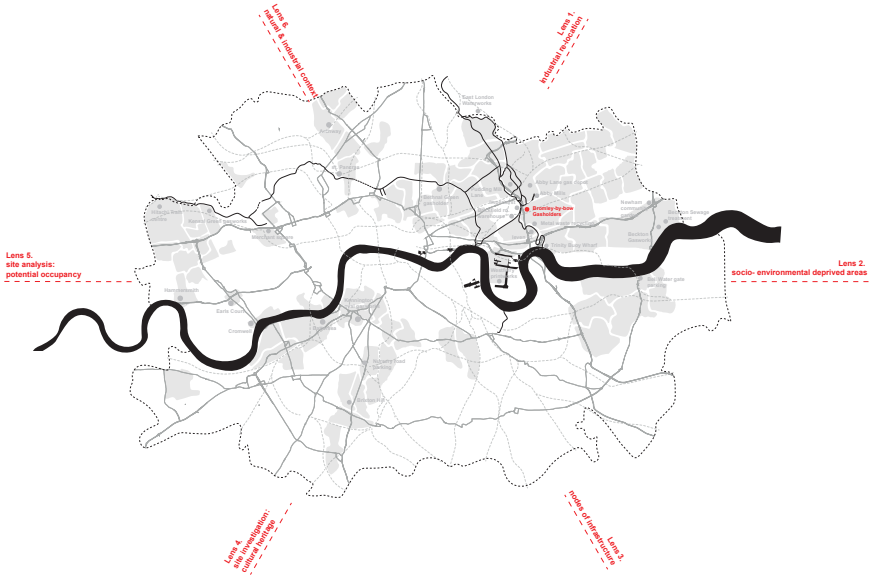







Lens 1.
industrial relocation
East London Waterworks
Bethnal Green gasholder
Kirby Mills
Bromley-by-bow Gasholders
Kennal Green gasworks
Beckton Gasworks
Lens 2.
socio- environmental deprived areas
Lens 4.
site investigation:
cultural heritage
nodes of infrastructure
Lens 3.


Lens 1.
industrial relocation
Bethnal Green gasholder
Bromley-by-bow Gasholders
Lens 5.
site analysis:
potential occupancy
Lens 2.
socio- environmental deprived areas
Lens 4.
site investigation:
cultural heritage
nodes of infrastructure
Lens 3.


Lens 6.
nature & industrial corridors
Lens 1.
industrial relocation
Bromley-by-bow Gasholders
Lens 5.
site analysis:
potential occupancy
Lens 2.
socio- environmental deprived areas
Lens 4.
site investigation:
cultural heritage
nodes of infrastructure
Lens 3.

CHAPTER 3

Reflection report

To summarize the whole process, it can be concluded that the approach investigated in the research has successfully translated into design. Eventually, the relationship between research and design is a clear, proportionate story, as the research provides the guidelines for the design of the brownfield development and simultaneously its most suited location within Metropole London.

However, the process of the graduation project was no straight coherent story line. Starting from the urge to address the social as well as the environmental issues, the appropriate focus of the project was not apparent until recently. The essence of the topic is about regeneration & ecological restoration. The social benefits are a derivative of this development and community inclusion. Once this epiphany shifted focus, the design got coherent. However, the mapping & research previously done is derived from an ecological as well as a social point of view as well. Reflecting on this process, the mapping of finding the most opportune-full brownfield site could have been conducted from a more ecological point of view. Even though this has been part of the mapping, other maps like cultural heritage & potential human occupancy are less relevant for the current development of the site. However, due to its landscape characteristics, the site ended up being perfect for the different landscape typologies and even helped me sharpen my topic of focus. In the end, this bumpy process helped me shape my project as it now exists and I'm satisfied with the result.

The choice of method was to develop a general approach for a contemporary, regenerative brownfield development. The argument for this approach comes from the general characteristics of the brownfield, in combination with the needs of the urban environment and finding the

relationship between the latter. The Brownfield in general can be seen as a summarized reflection of the problems addressed in the unhealthy, urban environment. To invent a general approach for these sites with similar characteristics and goals makes it a multi-scalar applicable development and therefore able to influence the larger urban organism. The topic of a contemporary brownfield development is deeply multidisciplinary. Environmental issues, natural dependencies & community understanding are a few examples where the disciplines of architecture and landscape architecture overarch and can be synergistically entailed in their approach, crossing disciplines of multiple master tracks. Metropolis London as the center of the industrial revolution contains many brownfields and therefore reflects the studio topic 'Heterogeneous London' relevantly.

The problem of the Anthropocentric urban environment is not unique to London. The unhealthy urban environment, the human-nature dichotomy and the Anthropocentrism that causes it are common in most urban metropoles. Therefore, the Ecocentric Third Generation city framework for regenerating brownfields would be relevant for most cities or industrial areas, London specifically as the center of the industrial revolution. Due to the abundance of brownfields in the urban environment of London, a counter manifestive development like the one discussed in the research paper will be most suitable. However, this strategy aims beyond the restoration of the ecology of the brownfield sites. Not only is the designer taking a new position towards the urban environment, it is also stimulating the user to do so, reflecting this in its (landscape) architecture. It aims for people to reconsider their position towards the urban environment and nature within.

However, multiple brownfield developments as discussed in an urban Metropole like London are unlikely to be realized. Due to the privatization of most brownfields in London, the absence of a profit model and the time of the development, it is not interesting to invest in. Because the development does have a high ecological & social value, it will most likely emerge from a top-down approach from Natural England & London Government, as no capitalist investor will invest time & money where no profit is feasible. It is the ethical, restorative development, which due to our current mindset & economical disadvantages will most likely not develop on the large scale. The prototype development will therefore be important for the succession of the following developments. Every tiny bit of restoration and awareness is a substantial improvement in a toxic metropole like London.

The final part of the graduation period will be reflecting on the theory to consistently develop a design derived from it. Reconsidering building criteria, aiming for regeneration, restoration, sustainability & an ambiguous community empowering program. So far, there has not been such a learning full experience as this graduation studio in the course of architecture studies. The elaboration of the project goes beyond the previous curriculums. Translating the readings & writing into designerly thinking, conducting the research mapping on several scales, and how this translates all into the design, is outstanding for the learning performance of the student.

- too much landscape approach
- too little building
-verkeerde focus in de mapping- sociaal had minder gekunt.
de focus was pas laat duidelijk

CHAPTER 4

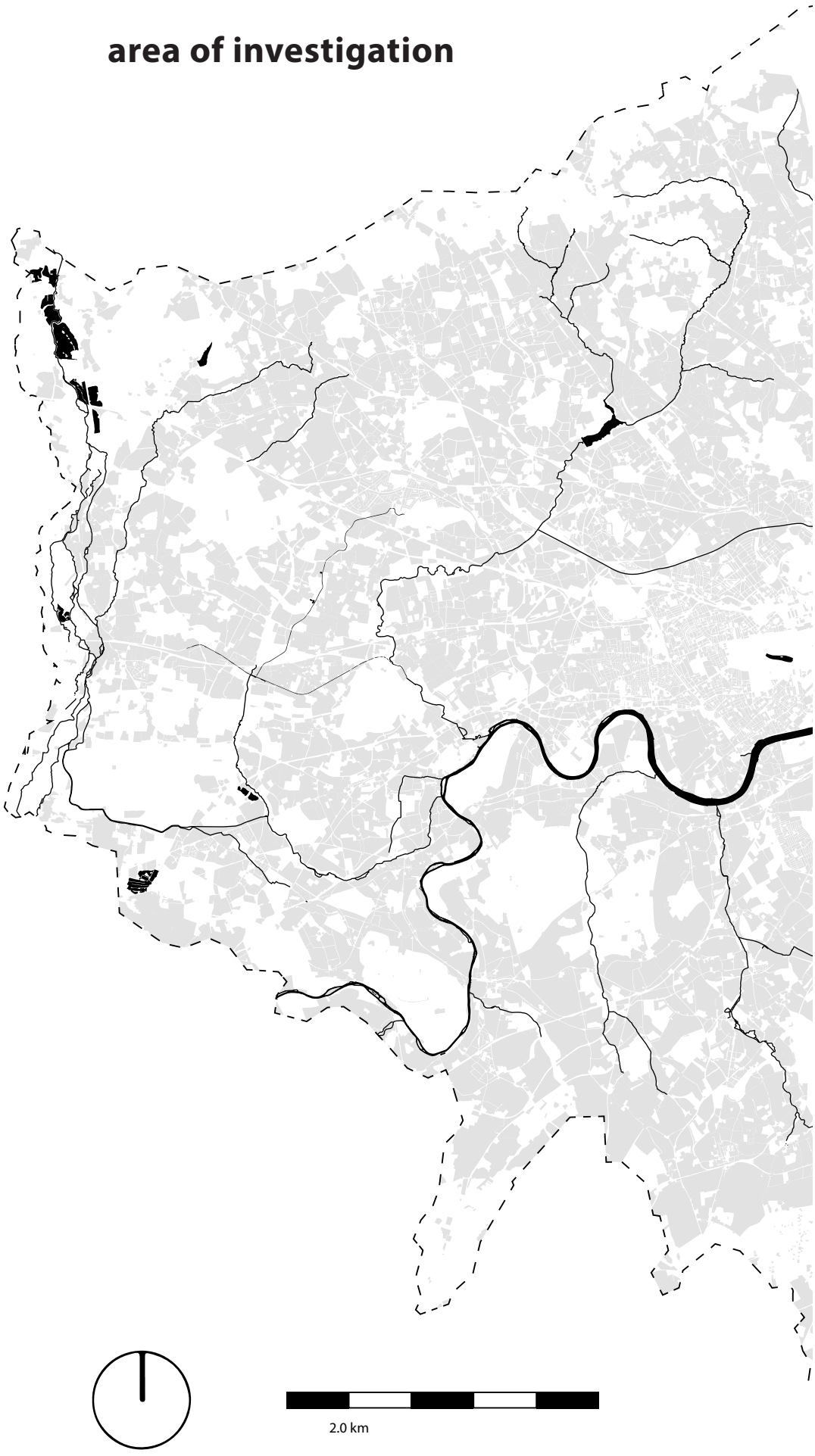
Site Analysis

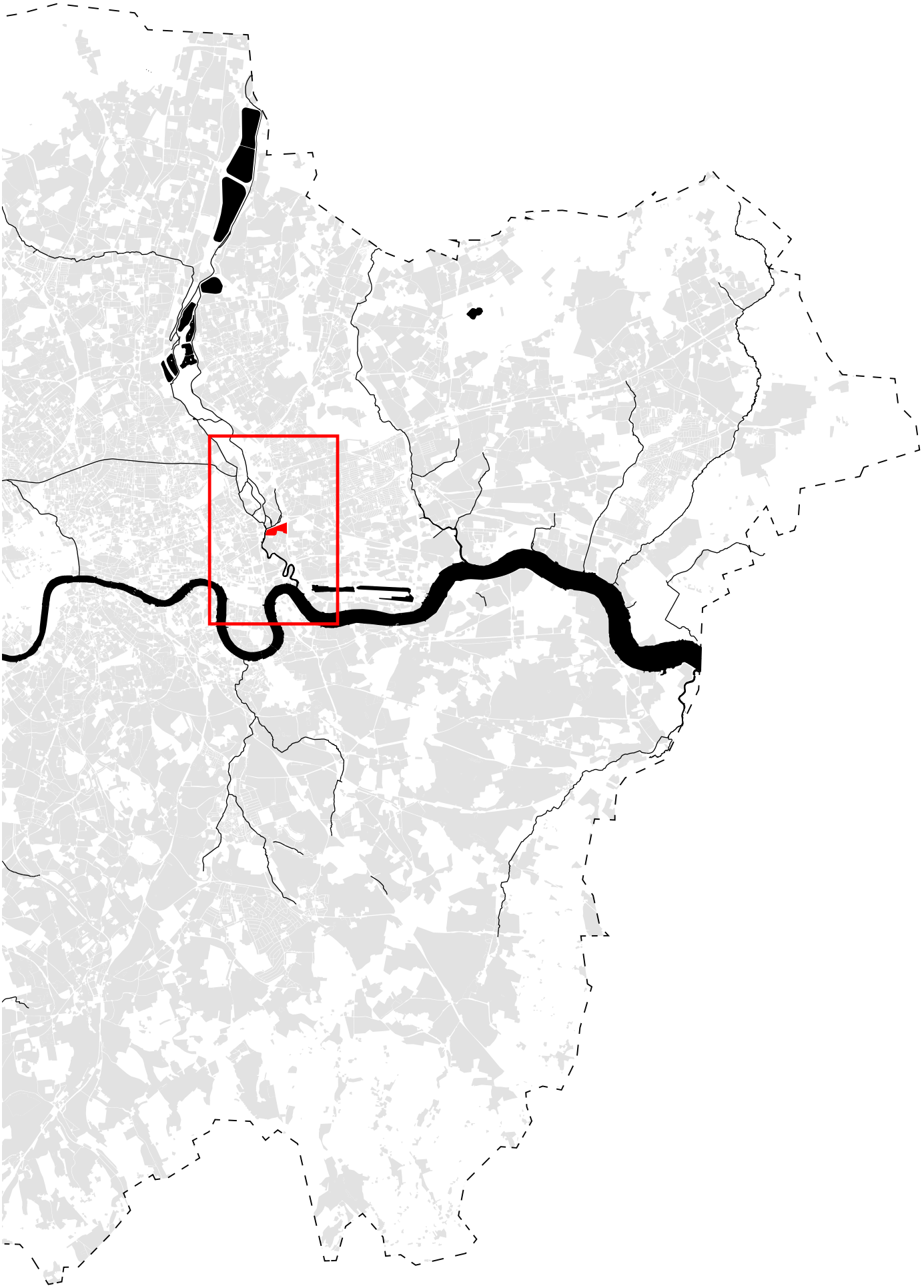
intro

The Bromley-By-Bow Gasworks as part of the Lea Valley region is situated in an area with a vibrant mixture of nature, industrial and residential areas. More specifically, the Bromley-By-Bow Gasworks is situated in an industrial enclave, adjacent to multiple vacant industrial sites with the appearance of Fourth Nature. The Vision for Lea Valley aligns with the analysis made & is therefore a guideline for the design. Due to the adjacent vacant industry, this site has the potential to become a testing ground of multiple restorative landscape typologies.

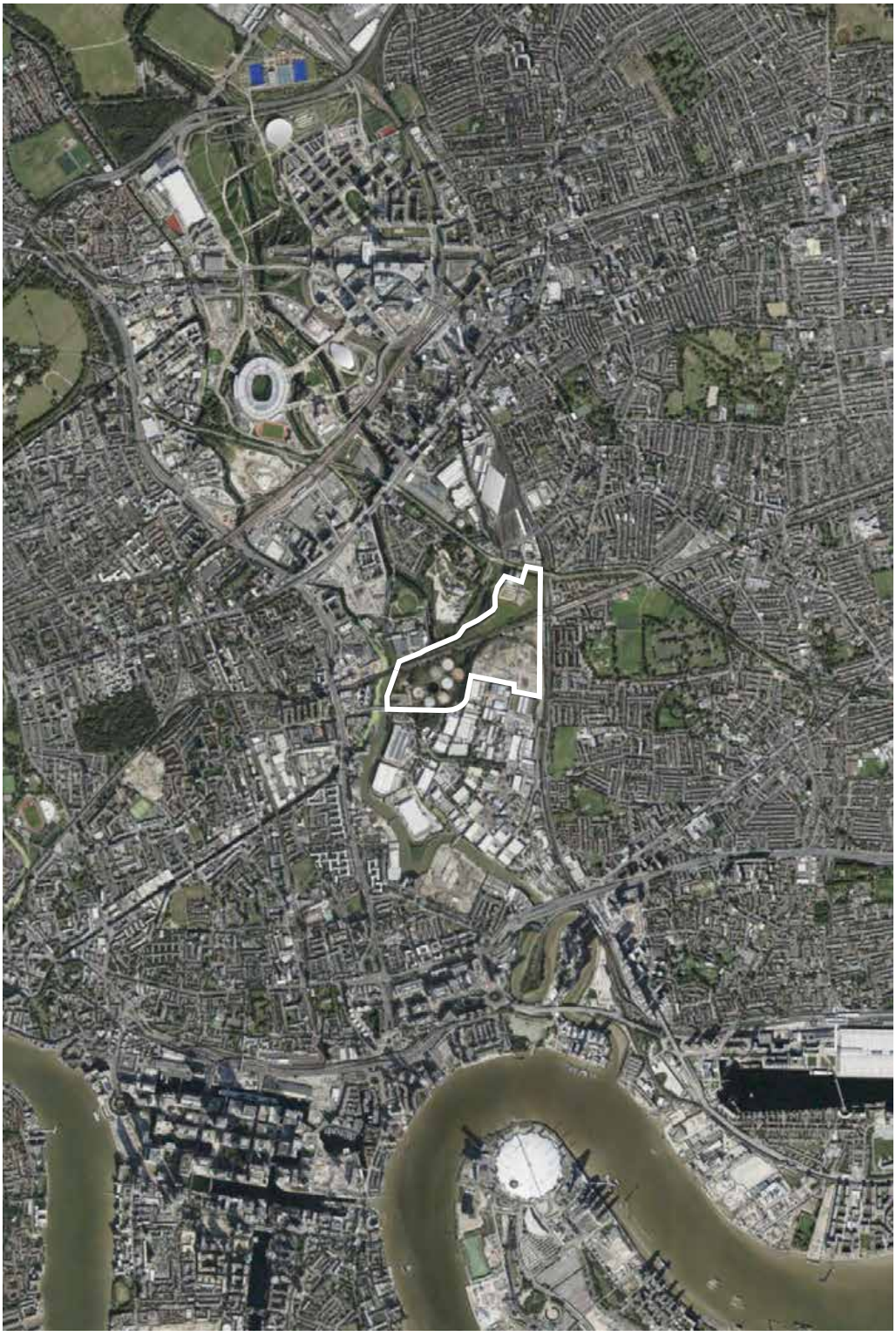
On the social aspect the location has the potential to stimulate community engagement in a vibrant way, connecting the more deprived areas of London.

area of investigation



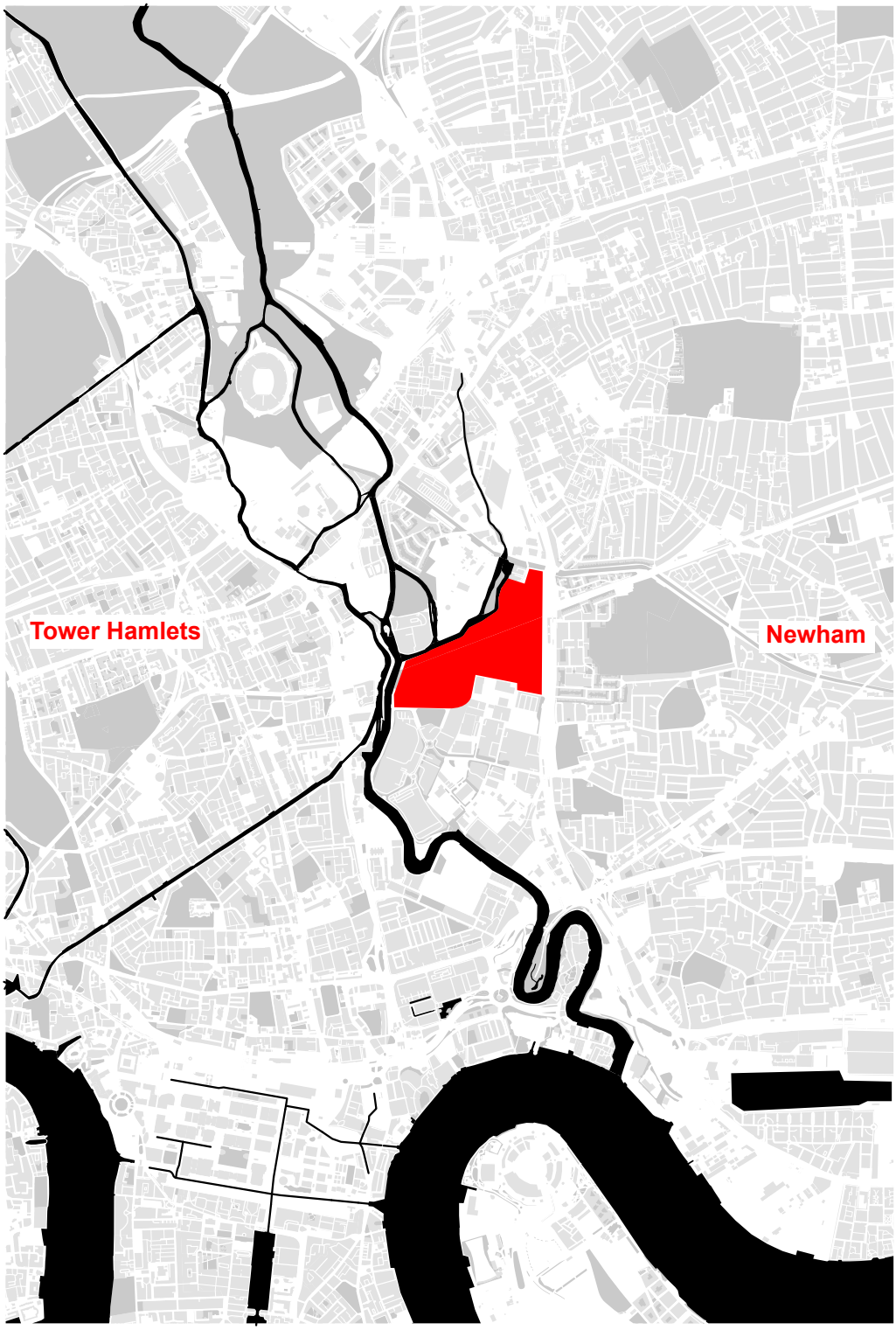


aerial



1.0 km

site



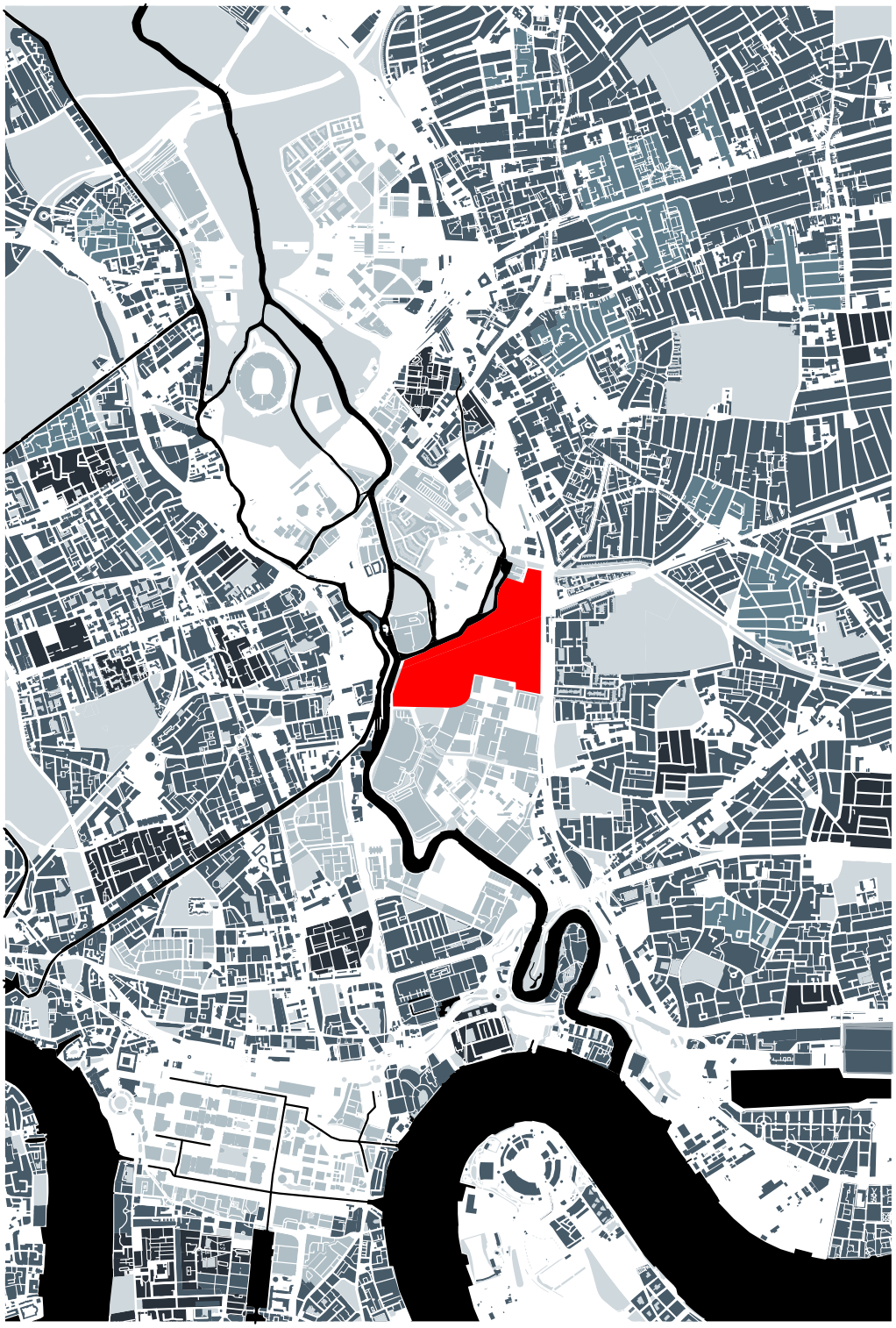
deprivation

1.0 km

deprivation scale 1:10

6 7 8 9 10

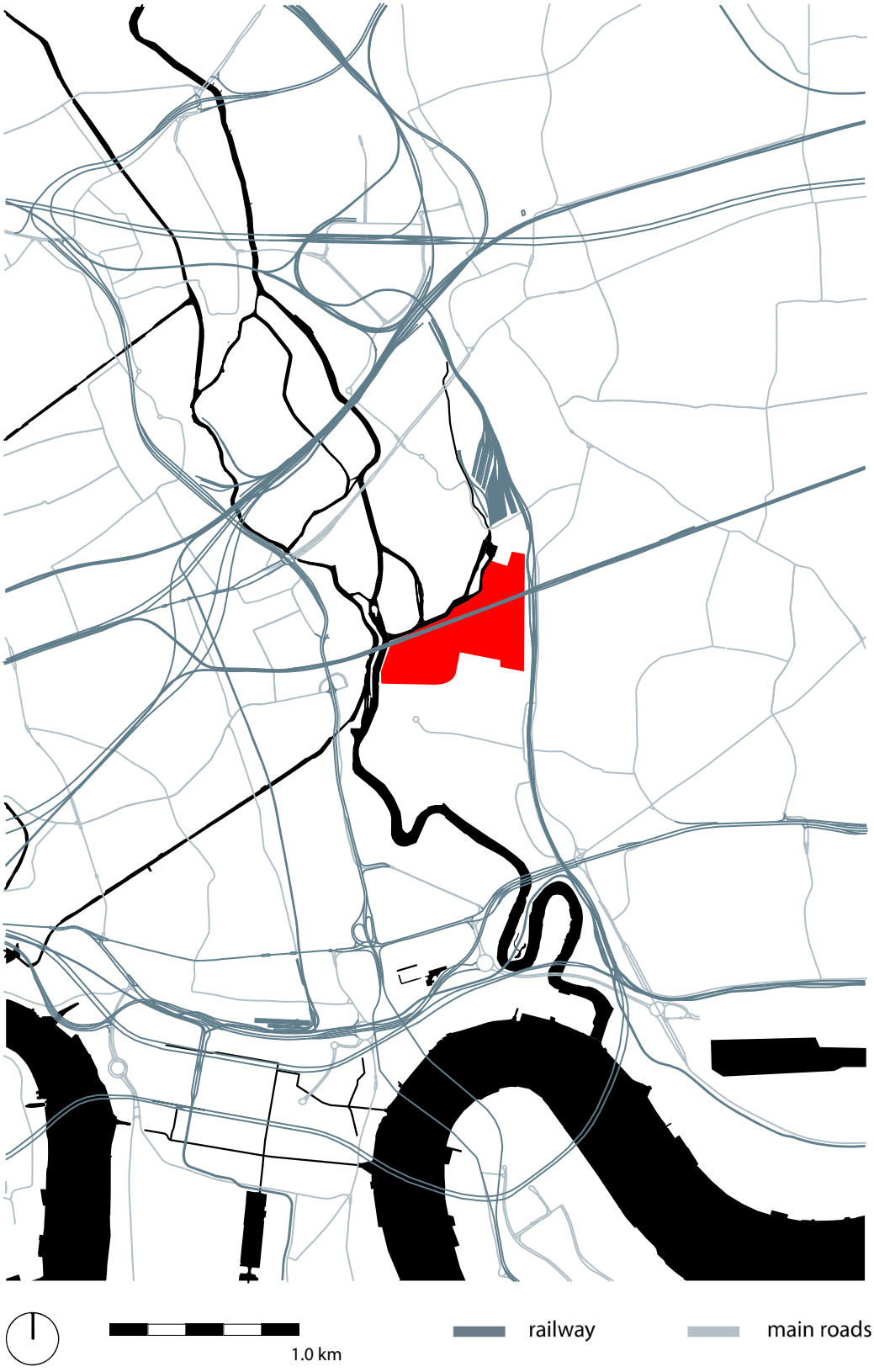
density



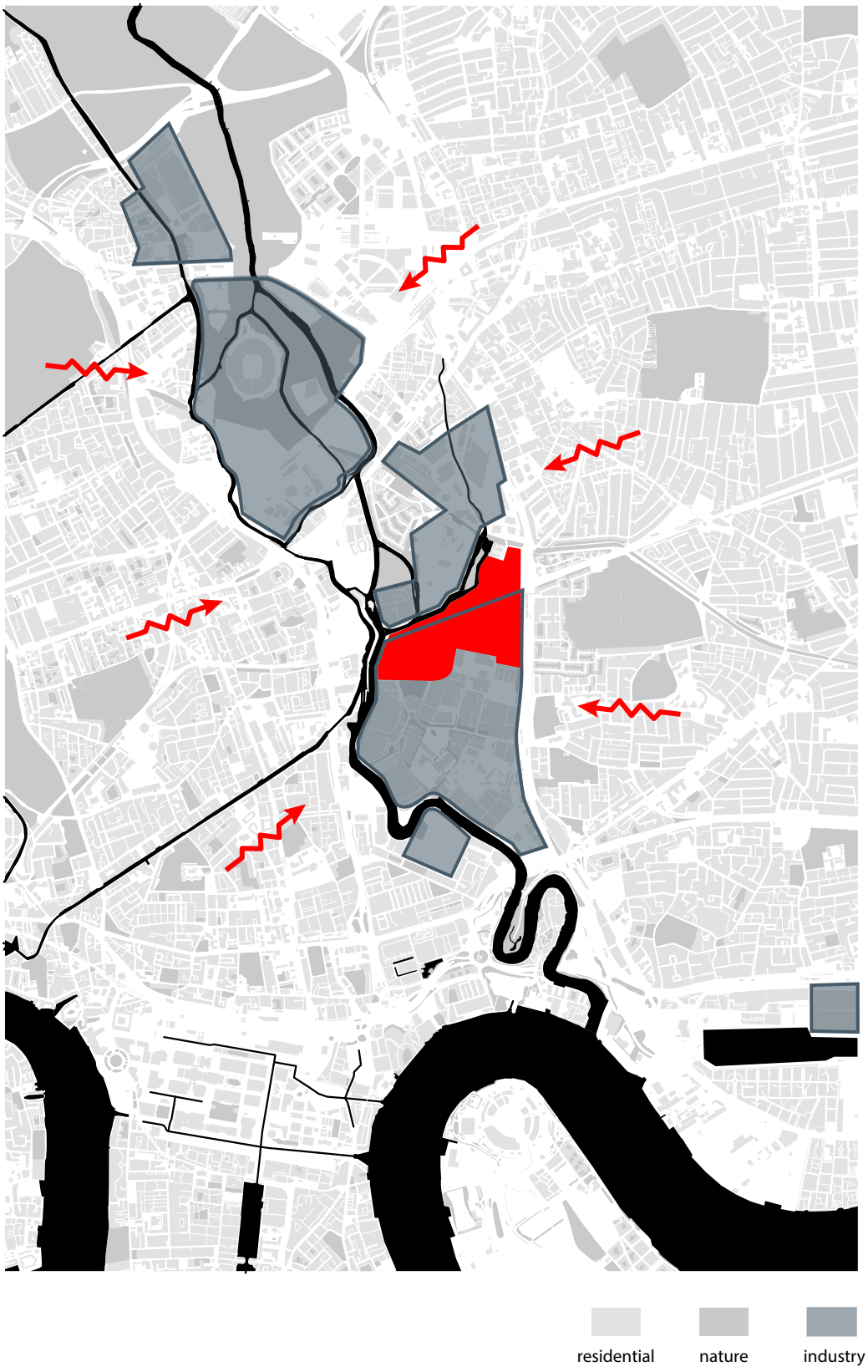
1.0 km

very low low medium very high higest

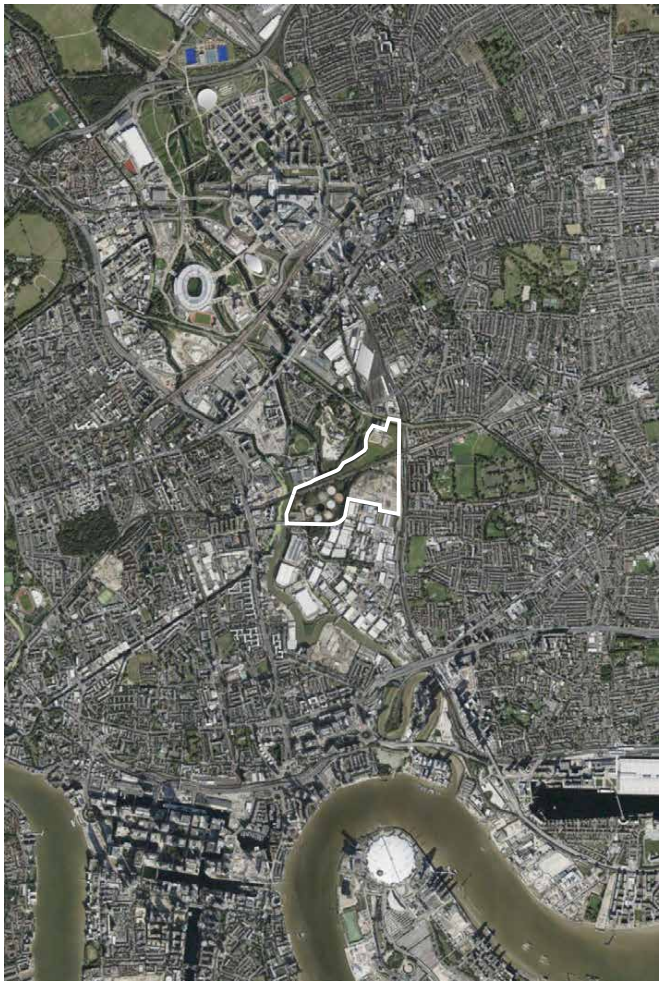
infrastructure



industry



aerial

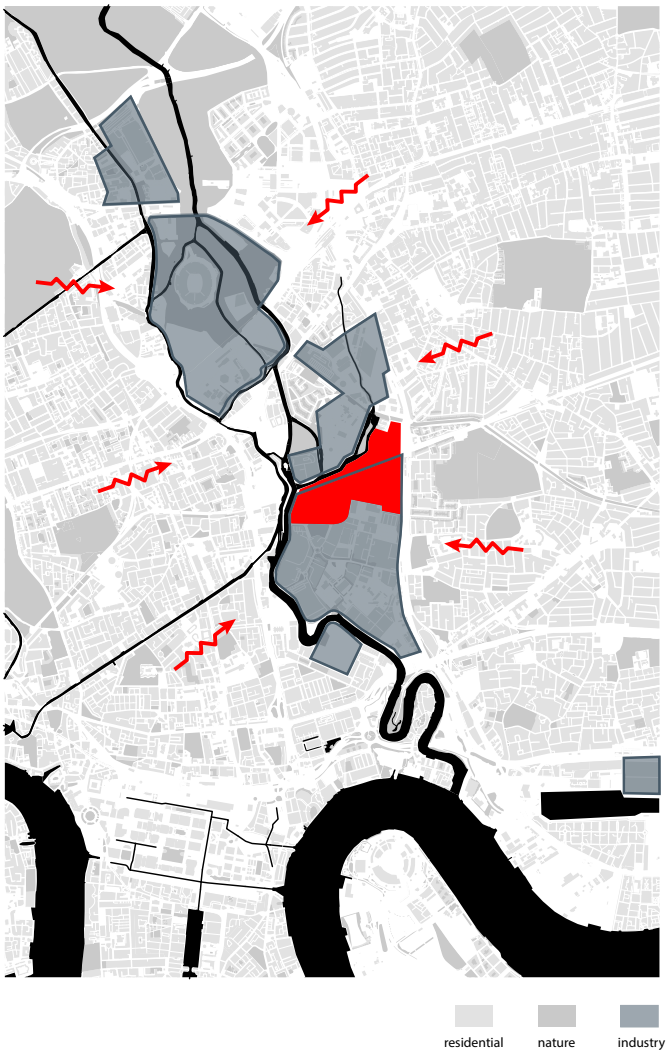


1.0 km

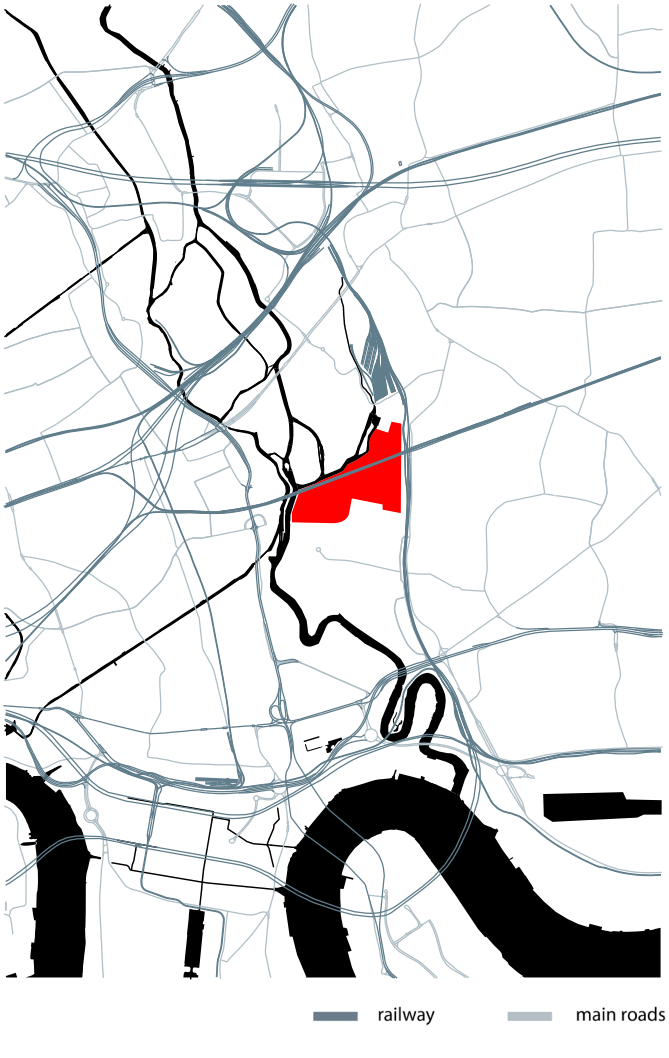
deprivation

deprivation scale 1:10

industry



infrastructure



London Government's vision Lea Valley

Increase access to open space, the Green Belt and the urban fringe

Conserve landscape and the natural environment and increase access to nature

Adapting to climate change

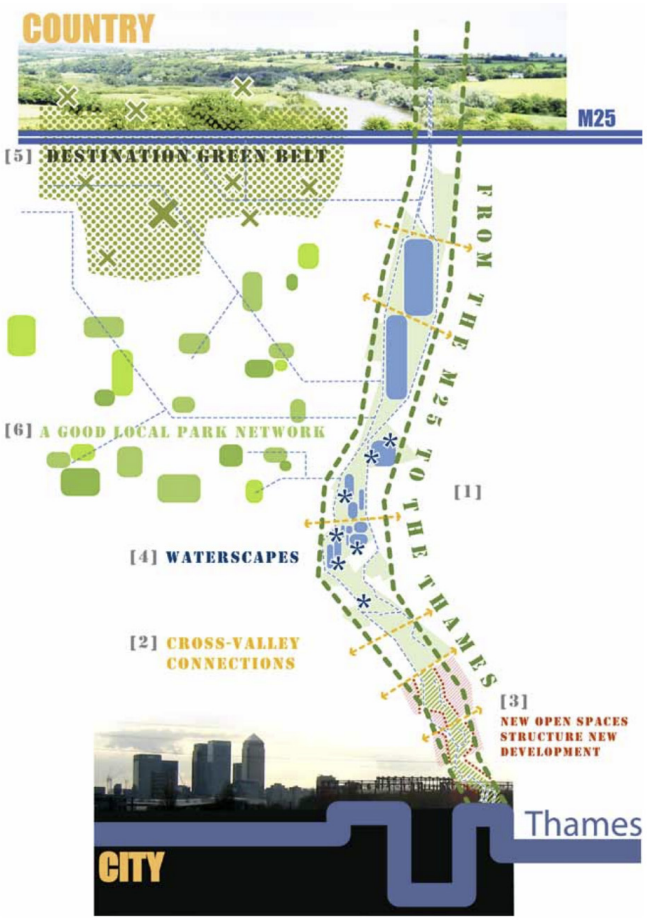
Making sustainable travel connections

Enhancing distinctive visitor destinations and boosting the visitor economy

Promote healthy living

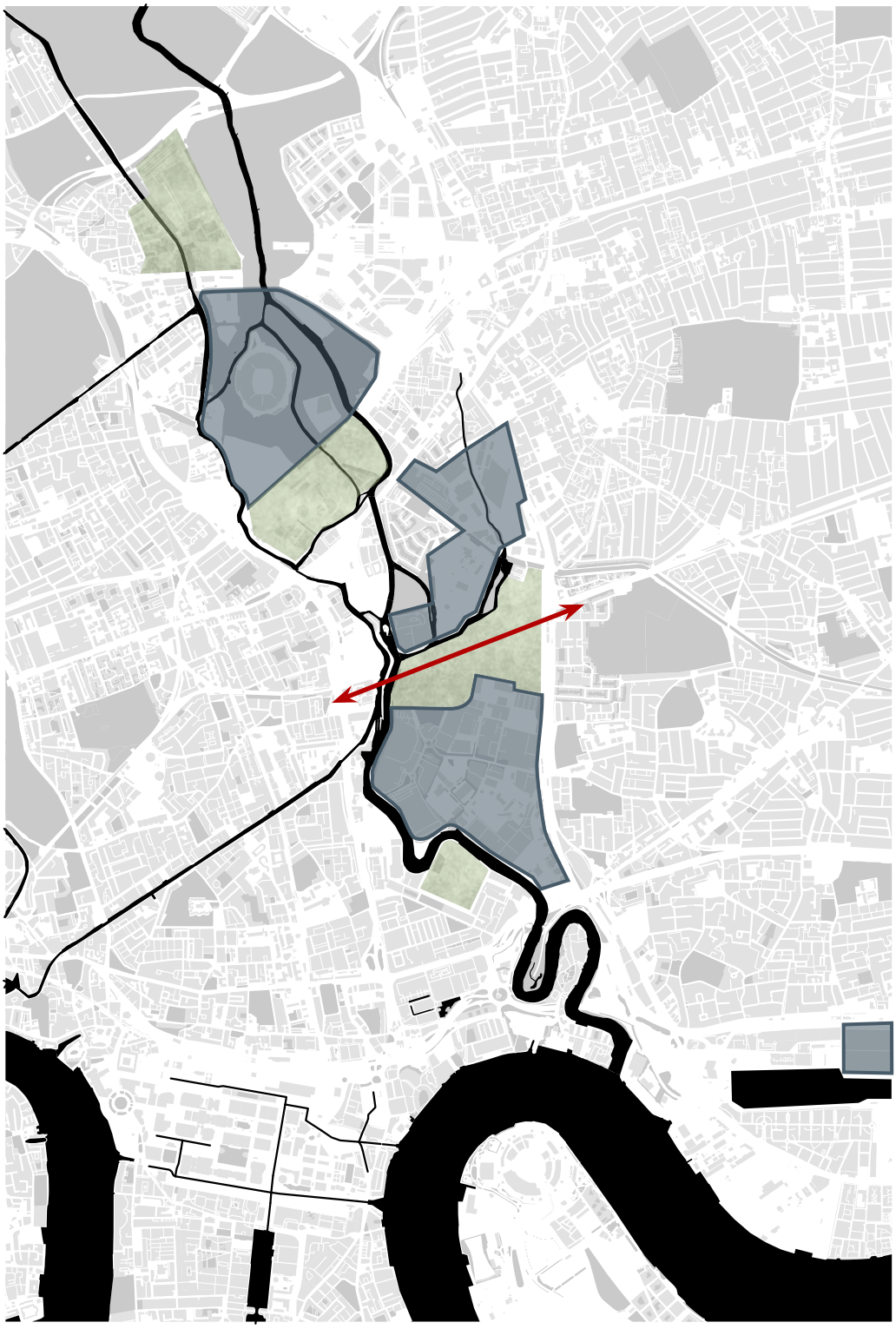
Promote sustainable food production

Promote green skills and sustainable design, management and maintenance

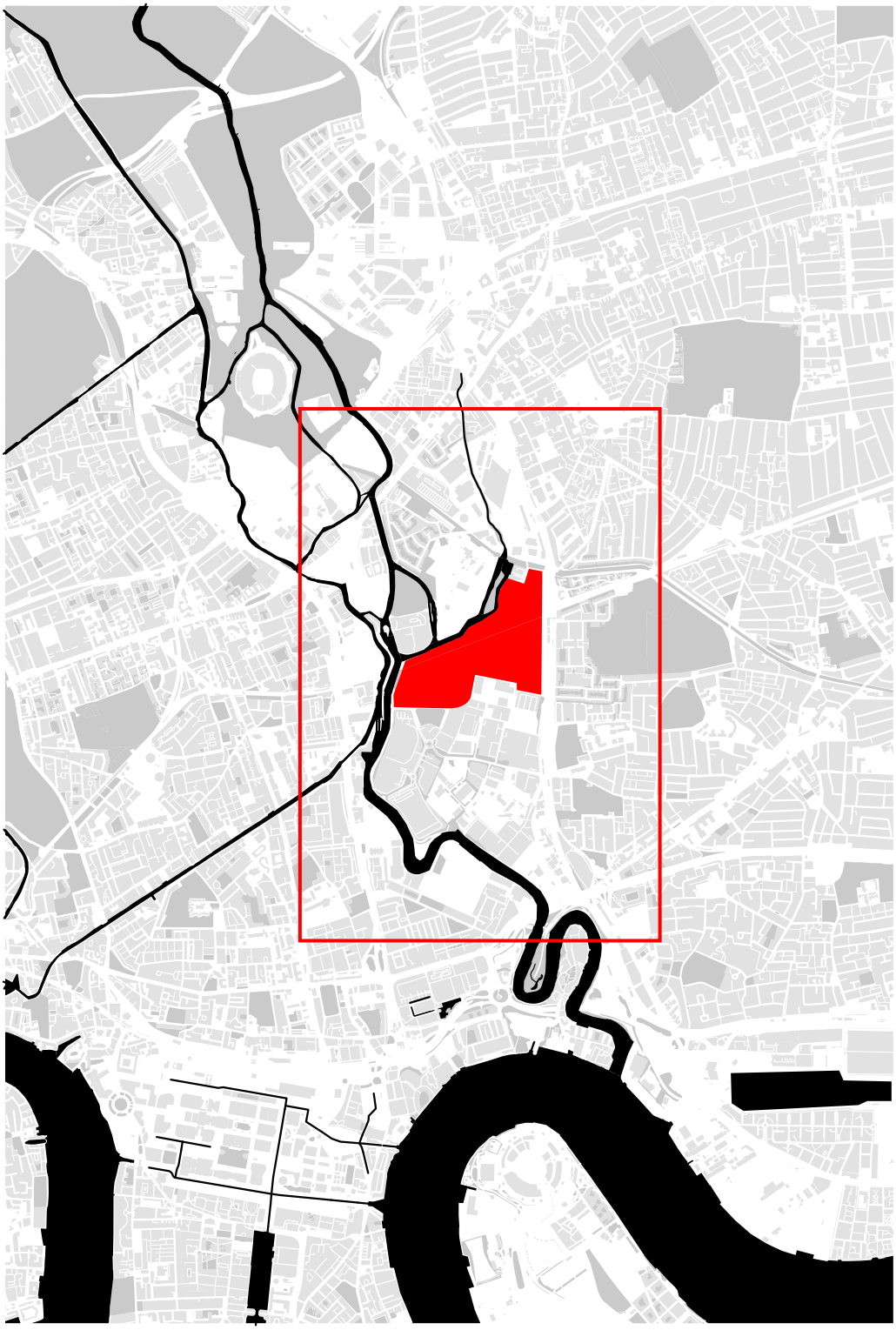


site as cross-valley corridor

site as catalyst for re-wilding

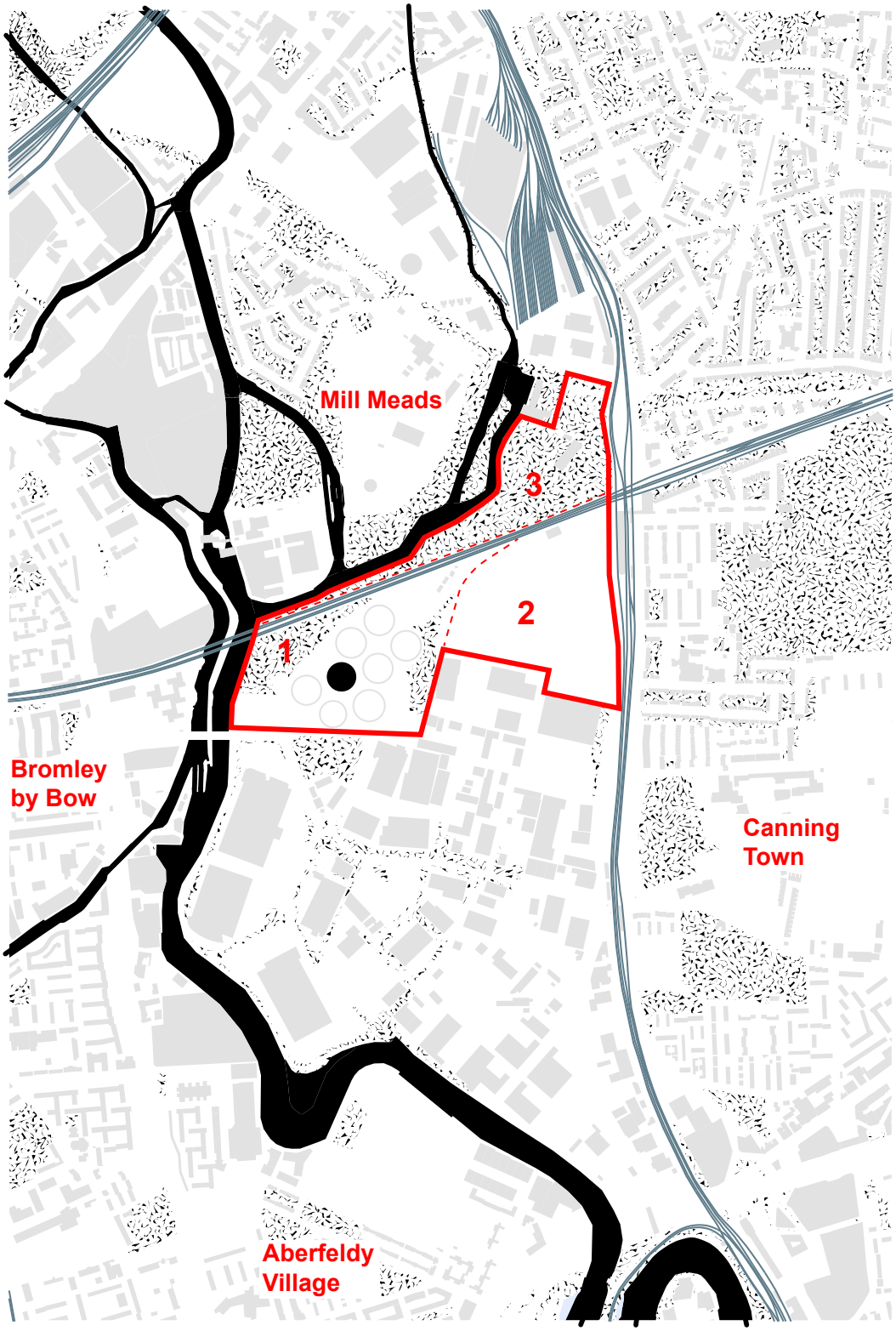


area of investigation

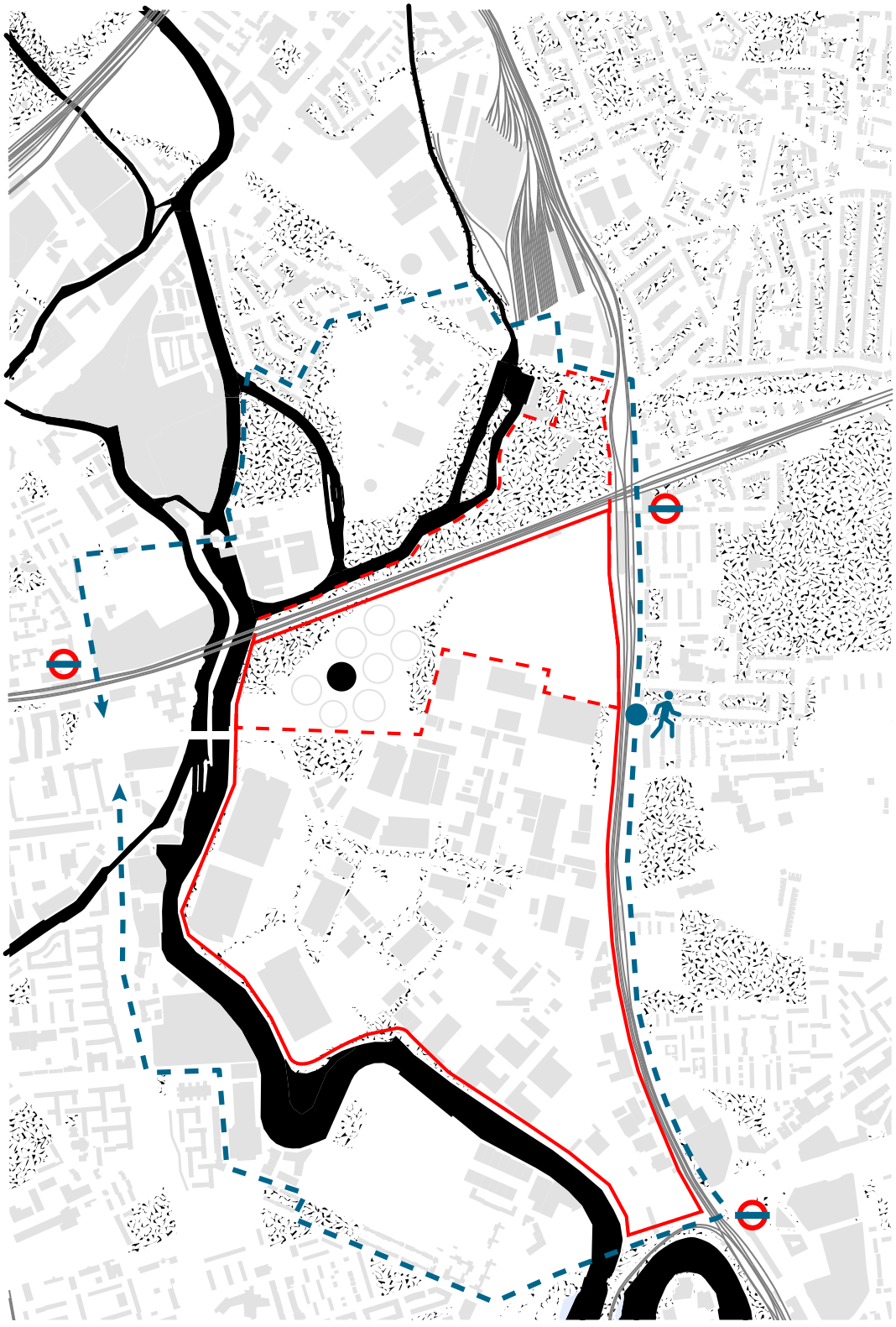


Aerial

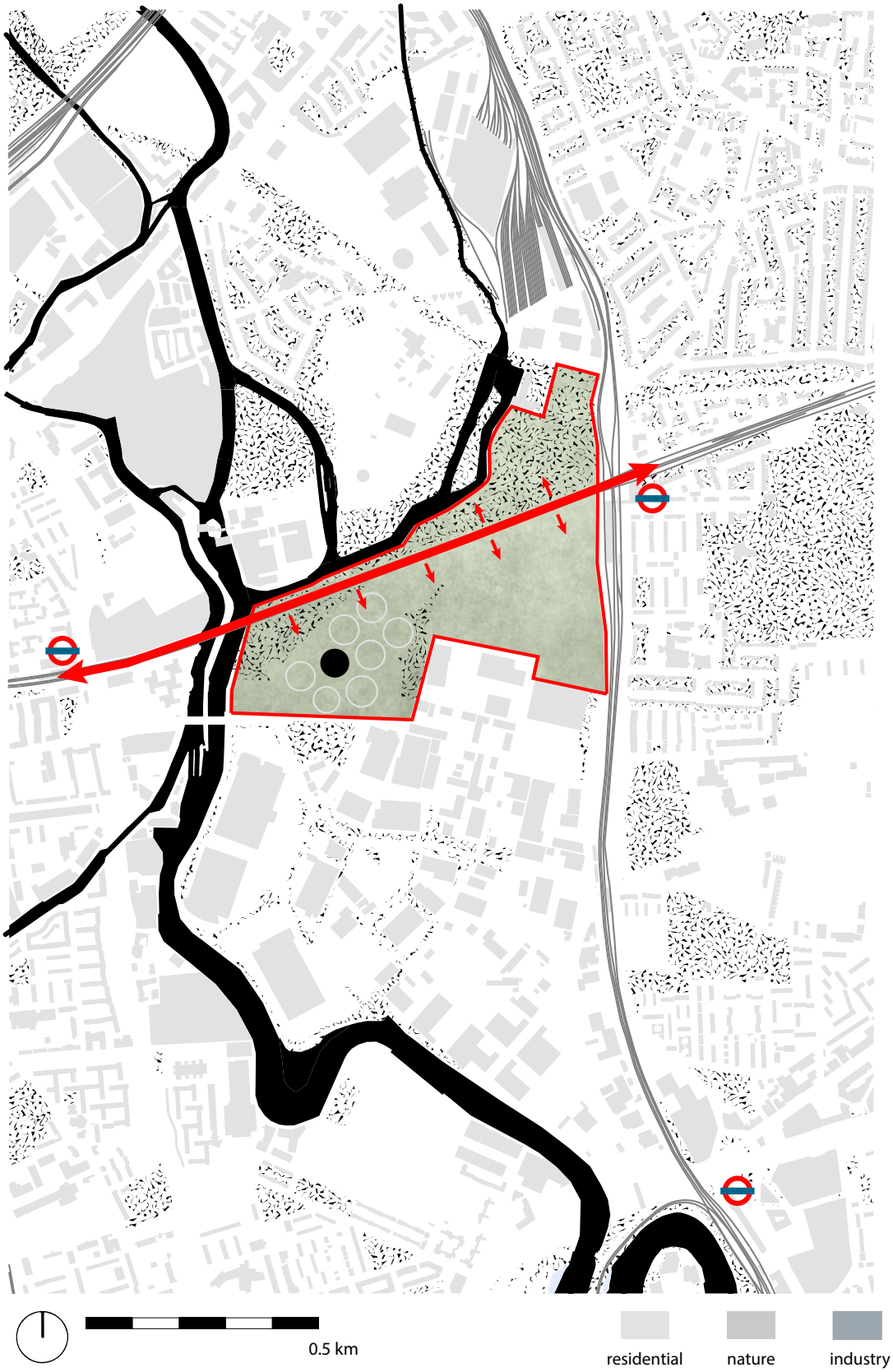
site division - one vacant system



infrastructural barrier



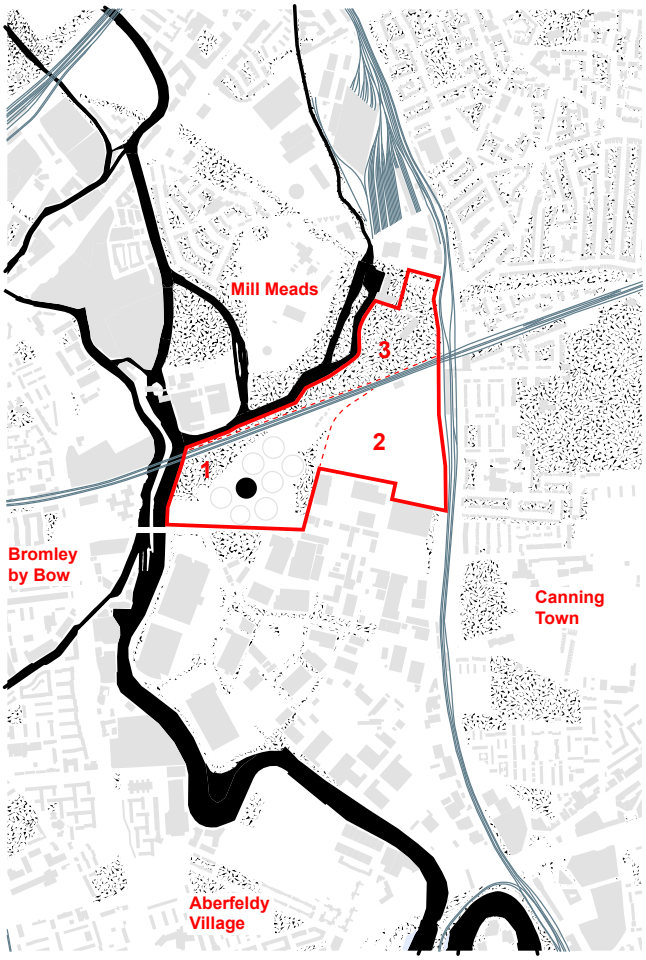
reconnection - re-wilding



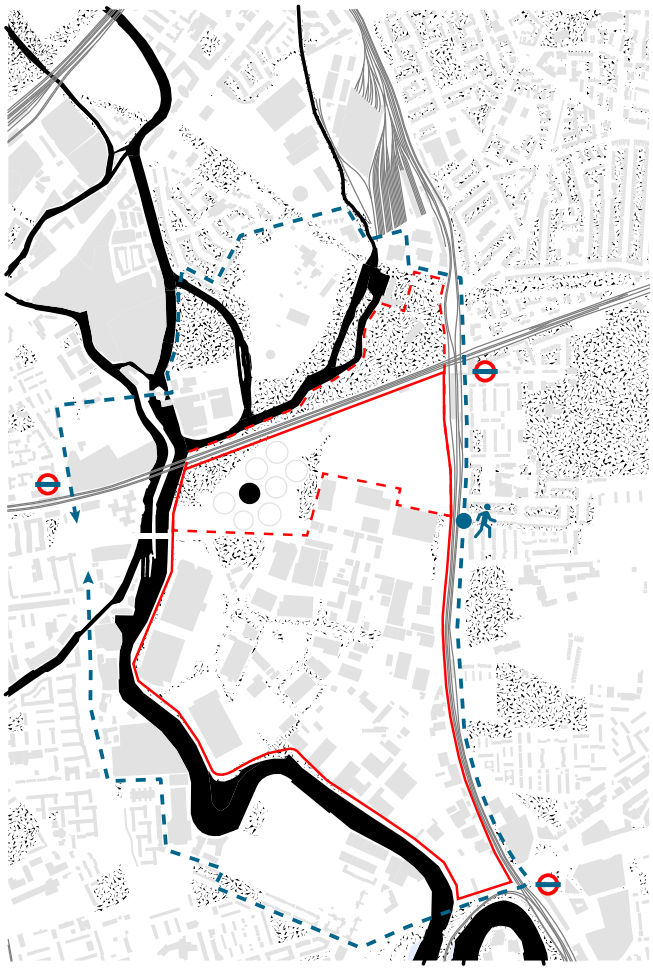
aerial

0.5 km

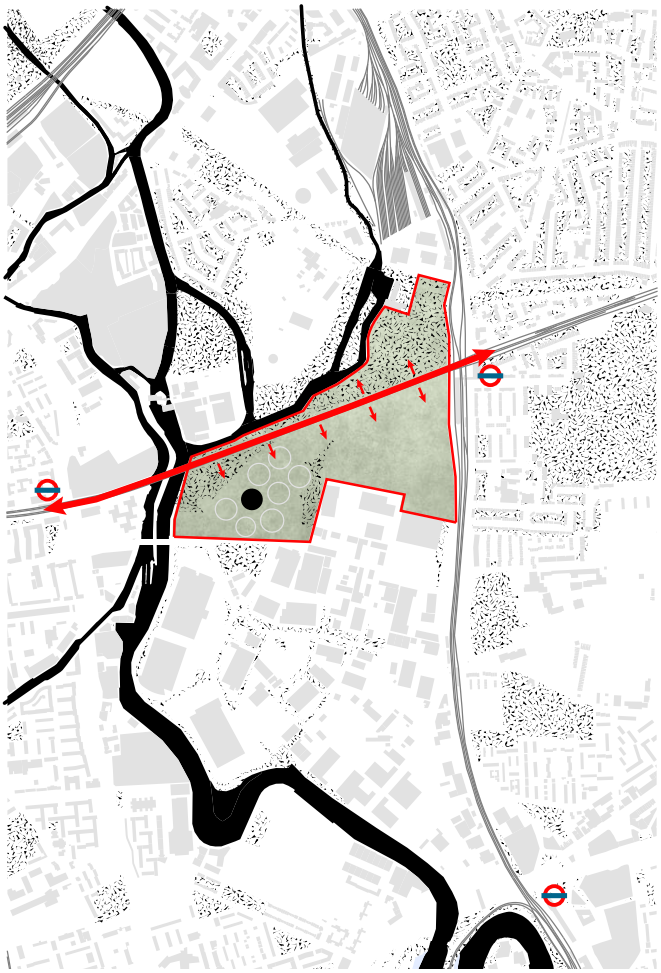
site



infrastructural barrier



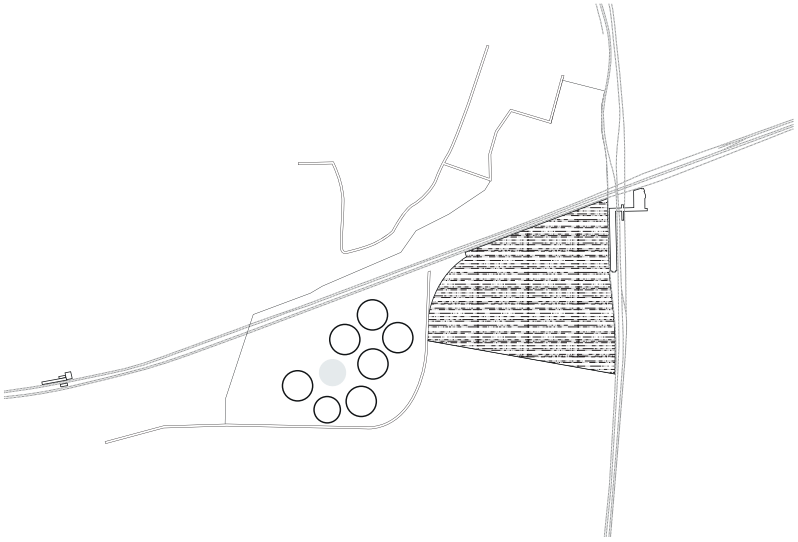
reconnecting - rewilding



one vacant system

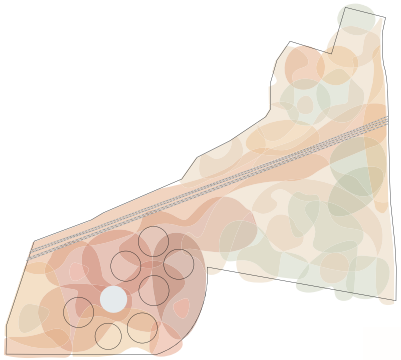
Analysis:

Existing landscape elements

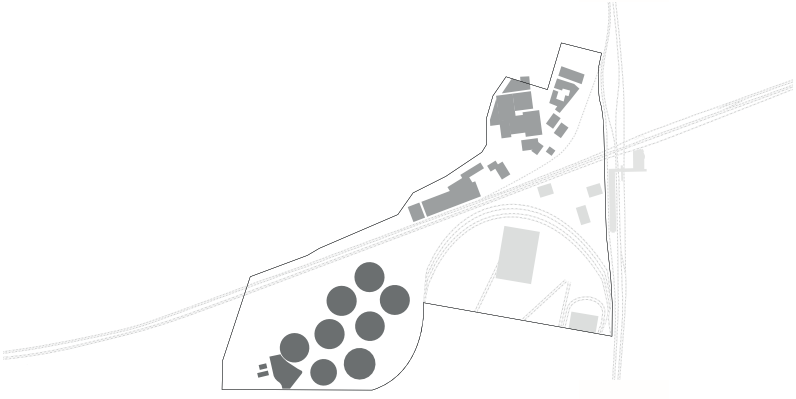


Existing landscapes

Pollution assessment

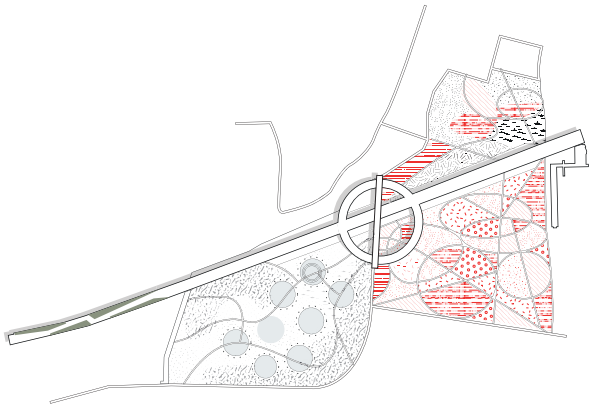


Historical polluters

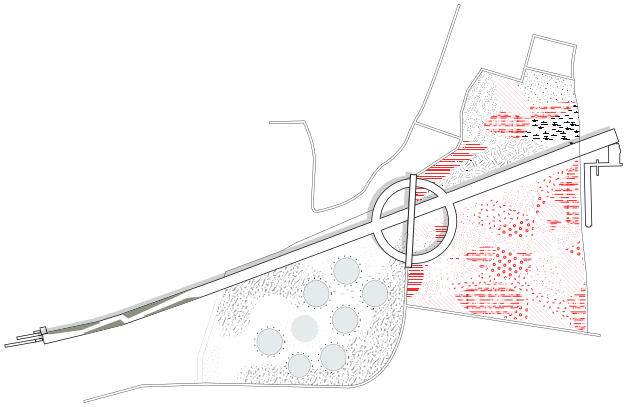


Masterplan:

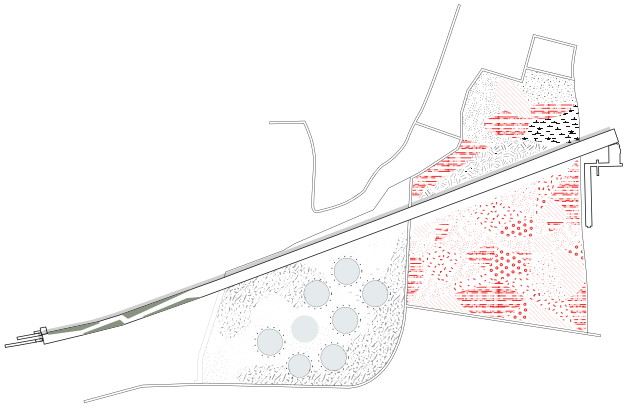
Infrastructure following landscape



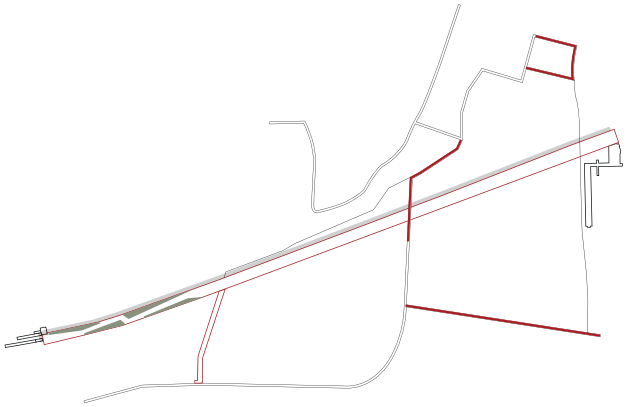
Building as junction



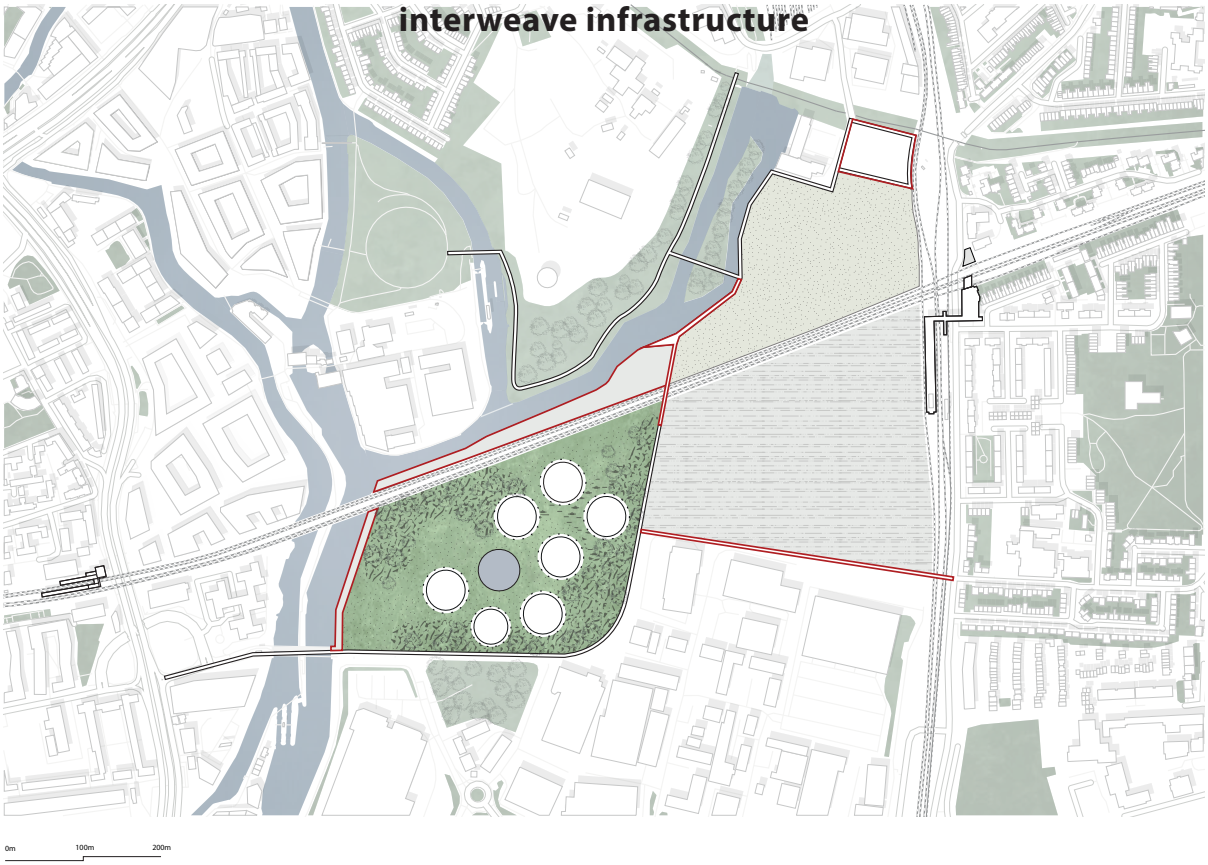
Landscape typologies

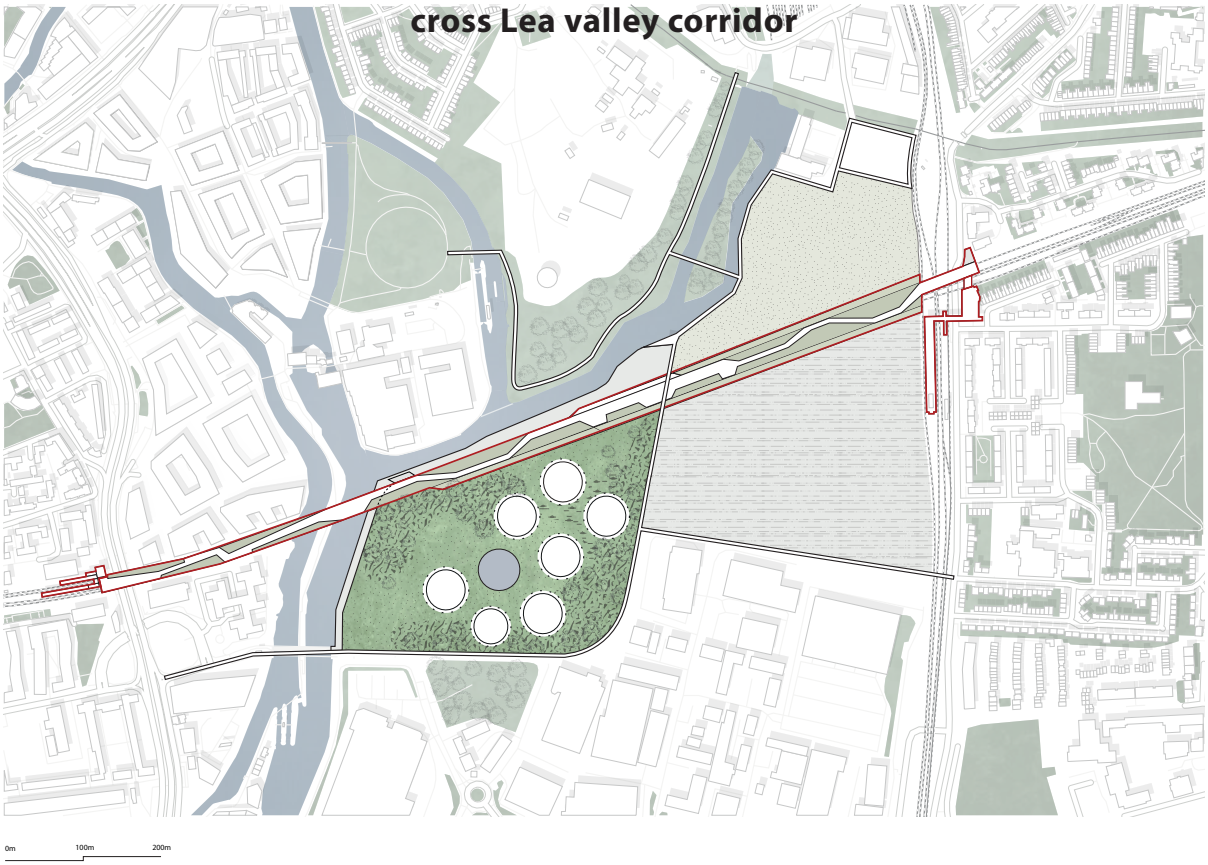


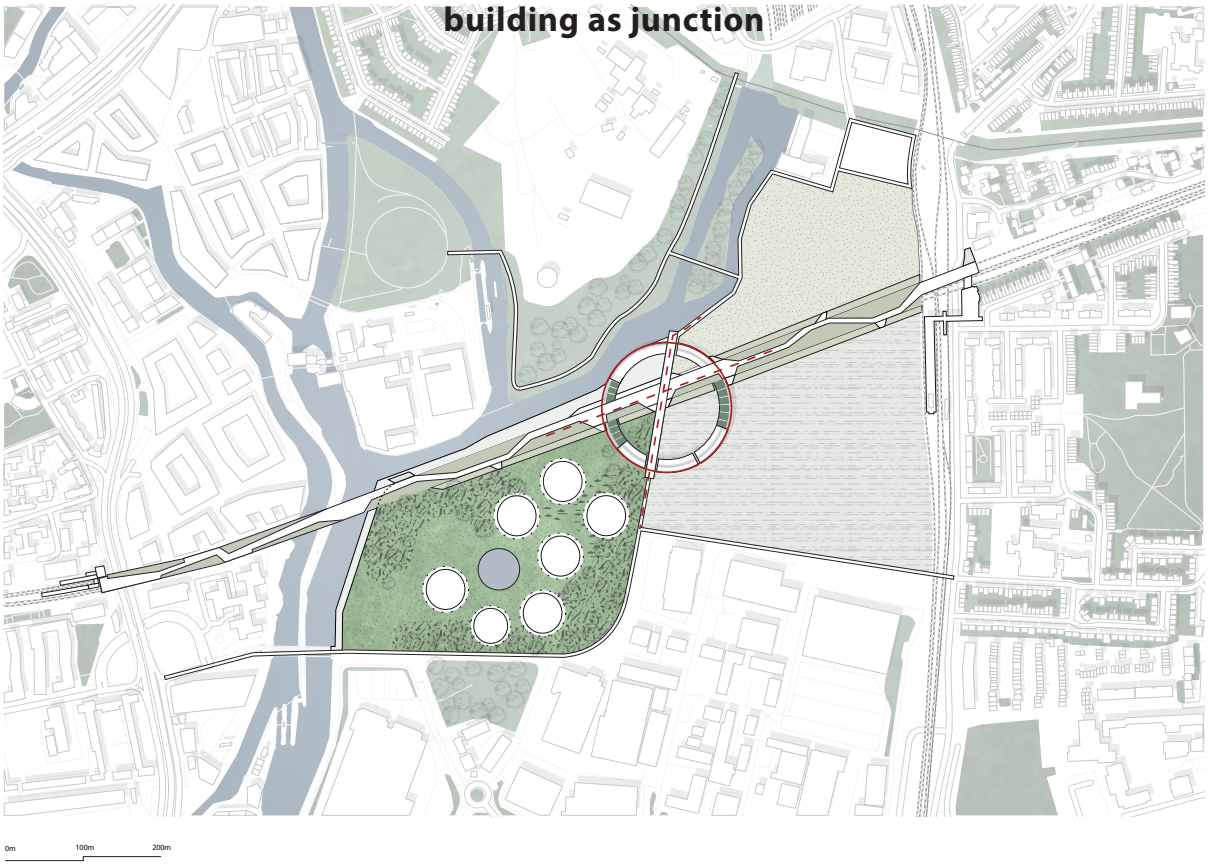
Interweave existing infrastructure



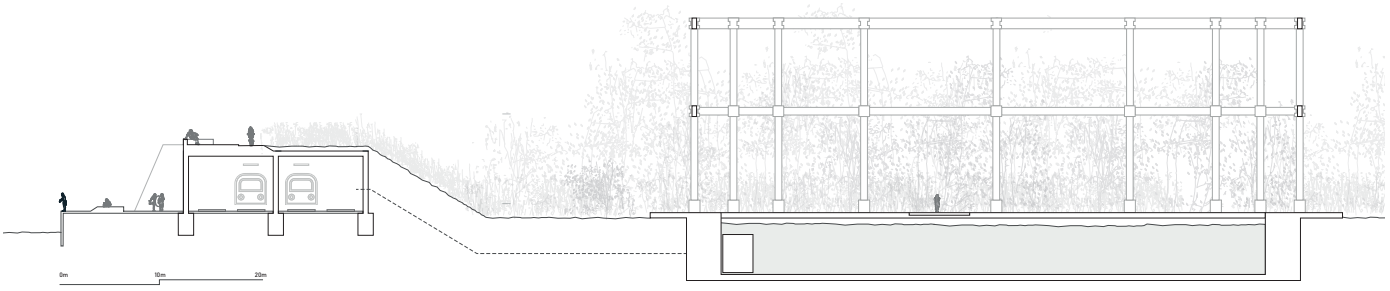

existing
3.
2.
1.
0m
100m
200m


interweave infrastructure
0m
100m
200m

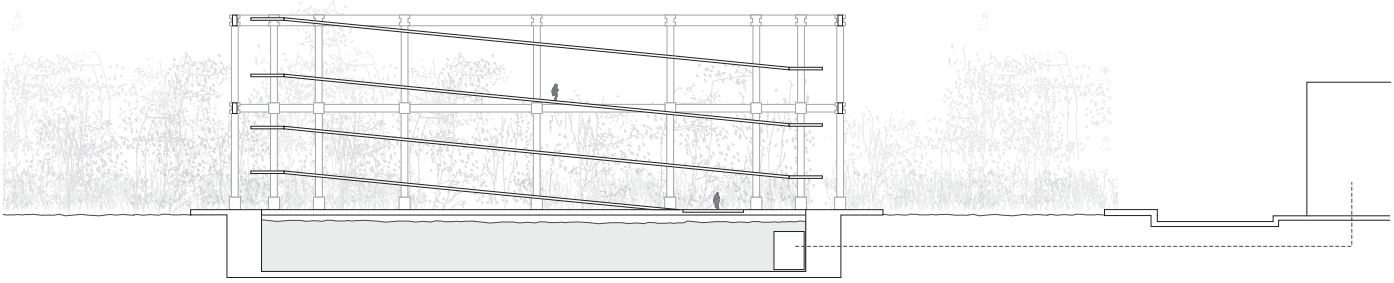

cross Lea valley corridor
0m
100m
200m


building as junction
0m
100m
200m

site section



masterplan



CHAPTER 5

references
list of figures

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Acosta, F., & Haroon, S. (2021). Memorial Parking Trees: Resilient Modular Design with Nature-Based Solutions in Vulnerable Urban Areas. https://www.mdpi.com/2073-445X/10/3/298

Arcgis. (2021). London Population Density [Map]. https://www.arcgis.com/apps/mapviewer/index.html?webmap=b452be9364694bfabf04fe1c6af7560f

Getty. (n.d.). he unexploded bomb was found by the gas works near Bromley-by-Bow station [Photograph]. https://mylondon.news.trem.media/news/nostalgia/terrifying-time-unexploded-bomb-the-23125541

Lichfields. (2016). Change in London's industrial floorspace supply (2000–2016) [Map]. https://lichfields.uk/blog/2019/november/28/in-search-of-london-s-future-industrial-land/

Montagu Evans. (2020, March). Aerial photograph showing the location of the former gasholder site at Marian Place facing south. [Photograph]. http://friendsofregentscanal.org/features/property-devt/Bethnal-Green-gasholders/planapp/docs/heritage-statement.pdf

Strava. (2021). Strava Heat Map [Map]. https://www.strava.com/heatmap#9.90/0.13188/51.58627/hot/all