

timeline of factory development



**A history of pollution**

**Lozerheide**

About 3 km from the Belgian border, and quite some distance from society, the factory sits on an island in the middle of the Lozerheide, part of the large Natura 2000 area known as 'Grenspark KempenBroek'. Previously a forgotten corner, Lozerheide was cultivated in 1892 when the brothers Dor bought the land after discovering its benefits in terms of the redundant water presence and well connected infrastructure with the Iron Rhine and the Zuid Willemsvaart being close by. Since then the landscape has changed drastically under the influence of the Zinc factory.

**Budel-Dorplein**

Simultaneously while building the new factory, a small community was formed on the intersection of existing sand roads and a new road parallel to the new railway that connected the community to the Iron Rhine. This community was provided for by the factory; housing, electricity, water, leisure, a place of worship, healthcare and more was all accounted for. The 60's and 70's were a period of big change for the factory. The high pollution of the factory had to be put to a halt, and this marked the end of the original factory that used thermal refining processing of zinc, resulting in large scale pollution of soil, water and air. The new factory made use of a production method using mostly chemical processes such as electrolysis to produce zinc.

**The factory and its environment**

While there's two sides to the story, the presence of the factory in the area has been problematic. The indifferent demeanour that the factory has towards its surroundings has manifested in different ways: Since +/- 2000 the ABdK (Actief Bodembeheer de Kempen) have spent 14 years and 150 million euros sanitising the area in a radius of 30km around the factory. While this operation was a relative success, the level of zinc & cadmium in the ground is much higher than the rest of the country to this day. The only contribution of the factory in this process is closing off the jarosite-basins, a site for dumping hazardous waste, with a layer of sand and covered up by solar panels.

**Other notable changes consist of:**

- Dumping hazardous waste from the production on site
- The cutting off of a large body of water, using one half for dumping waste
- Influencing the water bodies in the area; by pumping water needed in the production cycle
- The restricting of large areas of land

While some of these problems have ceased to exist, with the factory now having a clean production cycle, the Lozerheide has dramatically been influenced under the presence of the factory.

**Jarosite**

When changing to a new method of production in 1973, a new problem surfaced. As a result of the chemical production cycle large amounts of toxic output is generated which is known as the toxic material Jarosite. The material contains multiple heavy metals like lead, arsenic and cadmium, all harmful to the environment. Zinc manufacturers worldwide have accepted this to be a collateral product of production. Worldwide more than 50 million tons of Jarosite is stored in the ground, with potential leakages being a giant threat to the environment. At the Nyrstar site in Budel-Dorplein, approximately 2 million tons of jarosite is stored on large basins protected with a layer of plastic foil and covered by sand.

**Approach**

With this project I attempt to visualise the long history of pollution by introducing a new production site, parallel to the existing factory. The new production site works to process the 2 million tons of jarosite into clean building materials with the addition of effluent, another wasteful product.

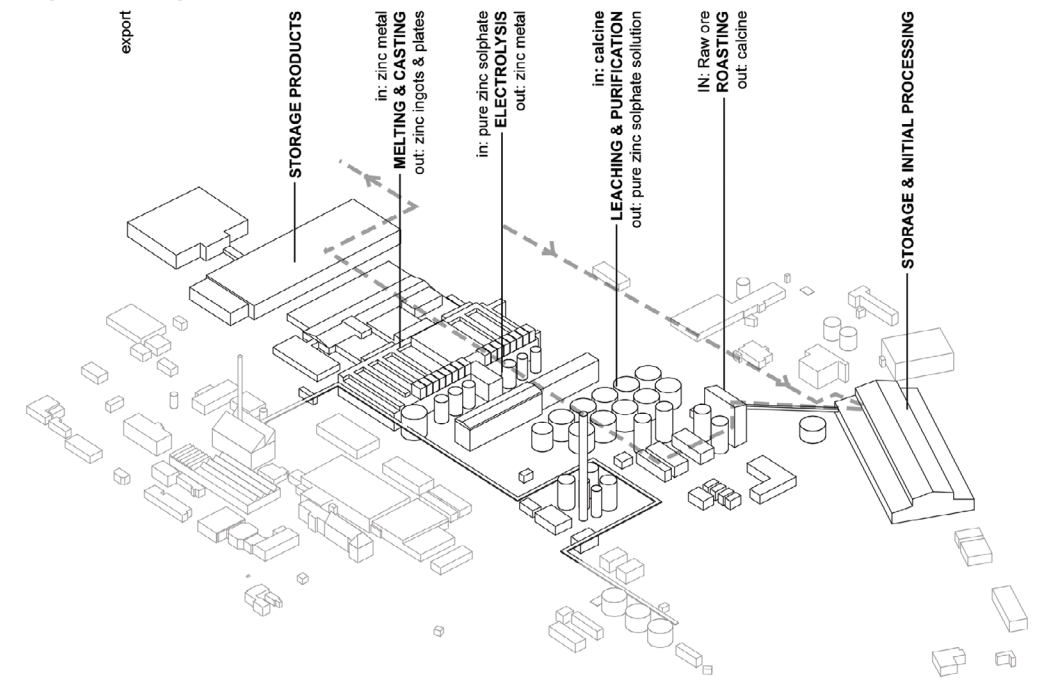
Breaking down Jarosite and effluent into useful materials and clean water is a process that takes several steps, each of which have their own area on the project site. All of these steps can be viewed from up close by the visitor via the pedestrian route that is laid out.

First the jarosite is excavated from the existing basins, after having removed the solar panels covering them. The dug material is stored in silos, as well as the effluent which is imported from an external source. The first step in the production process is separation of solids from liquids. In this area a high catwalk sits in between the separation tanks. After separation, the liquid is transferred to the reactor where a process consisting mostly of bacterial reaction removes sulphate from the liquid. The solids are transferred to the thermal plant, where thermal treatment at temperatures below 1000C using chlorination is used to remove the metals. Metals like lead, silver and zinc are concentrated and a clean granular product is produced. This product is further processed into a basalt like material by pouring it into moulds, resulting in construction products that can be any shape and size necessary.

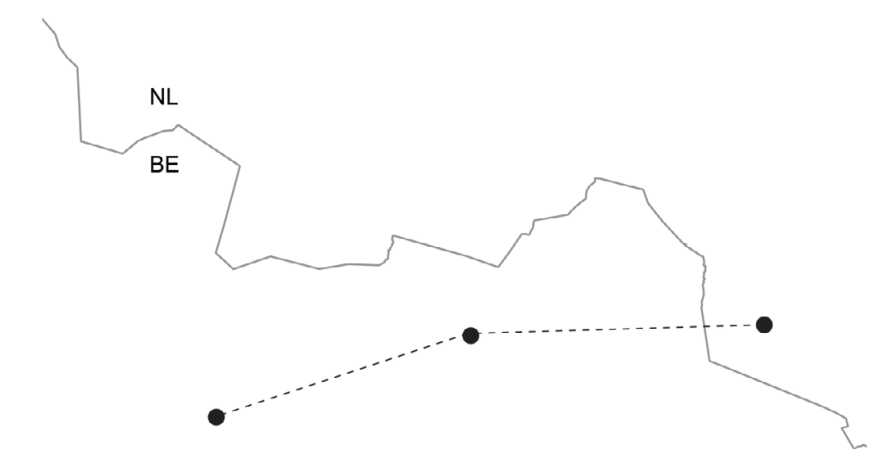
The two separate water flows that are put out by the thermal treatment and sulphate removal are then transported to the front side of the factory and stored in the waterpower. In the visitor center, next to the pond that is used for seepage by the factory, the water is purified in a visible manner, before it is put out into the landscape as a water stream.

The water stream serves as a visual reminder of the longevity of creeks and rivers, and the potential that they have to carry pollution to distant areas.

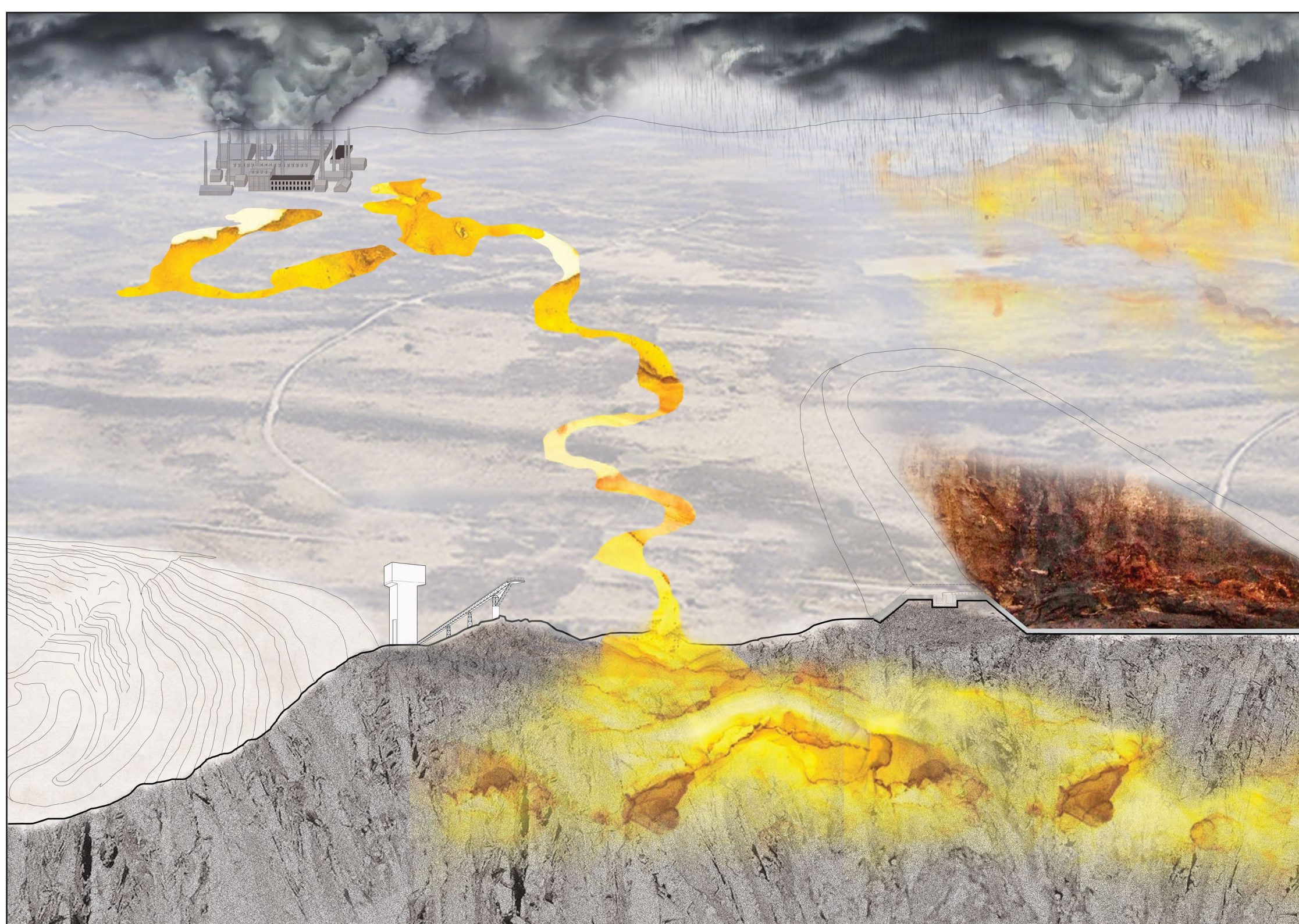
**zinc production process**



Nyrstar global zinc enterprise



cross border factory community



pollution collage





existing jarosite basins

solar farm

excavation site

excavation dump

jarosite storage silos

effluent storage silos

thermal treatment

sulphate removal

separation of liquid & solids

material processing of solid output

water output

existing railway supply

visitor pedestrian bridge

supply route

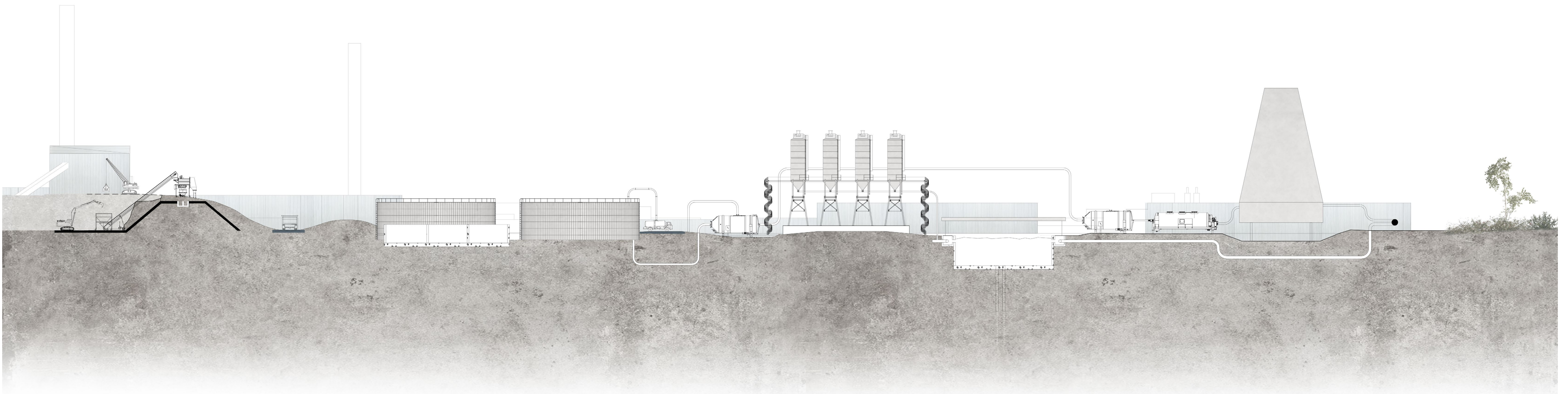
water tower

visitor center & water purification

visitor entry

water stream





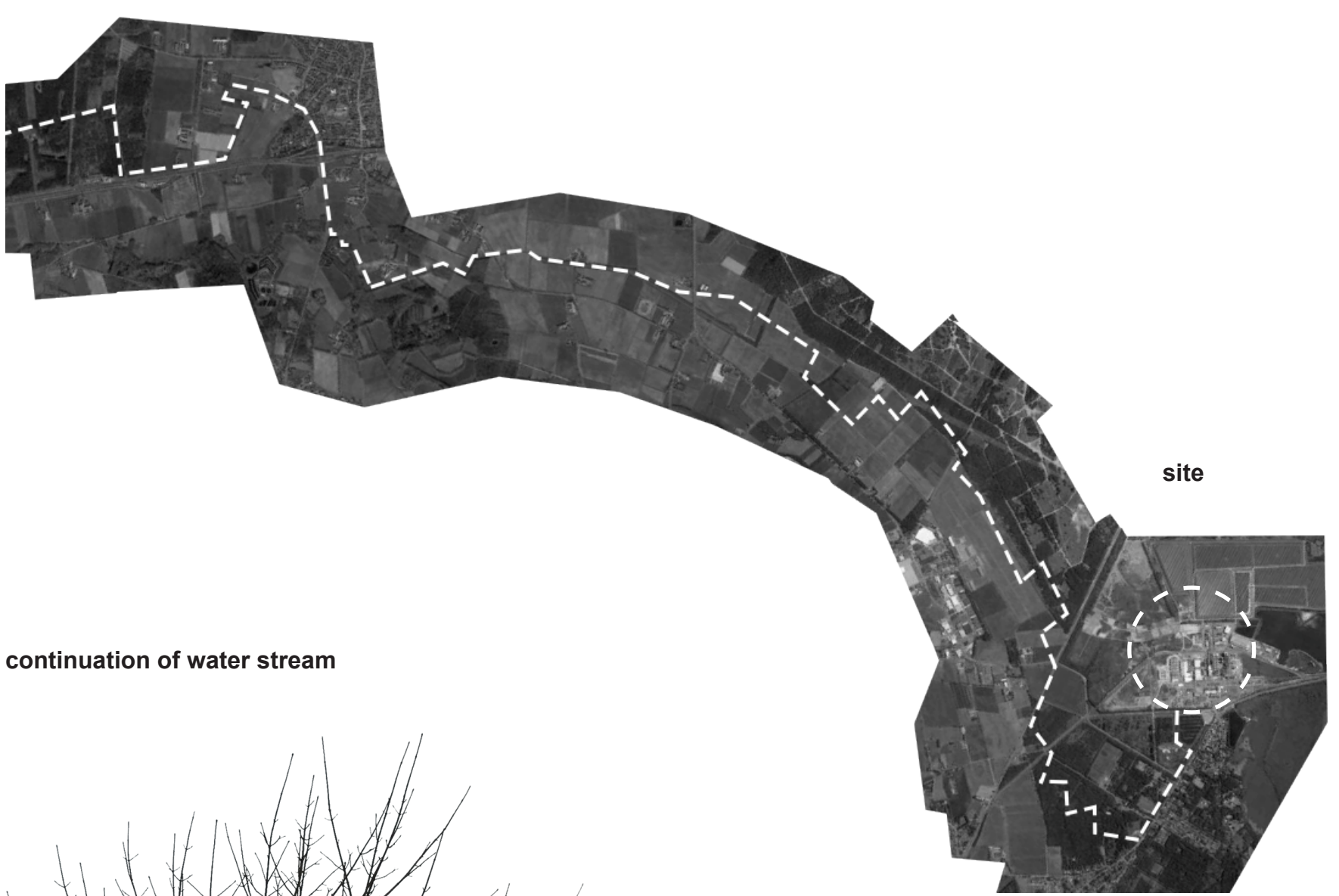
section of the processing site 1:750



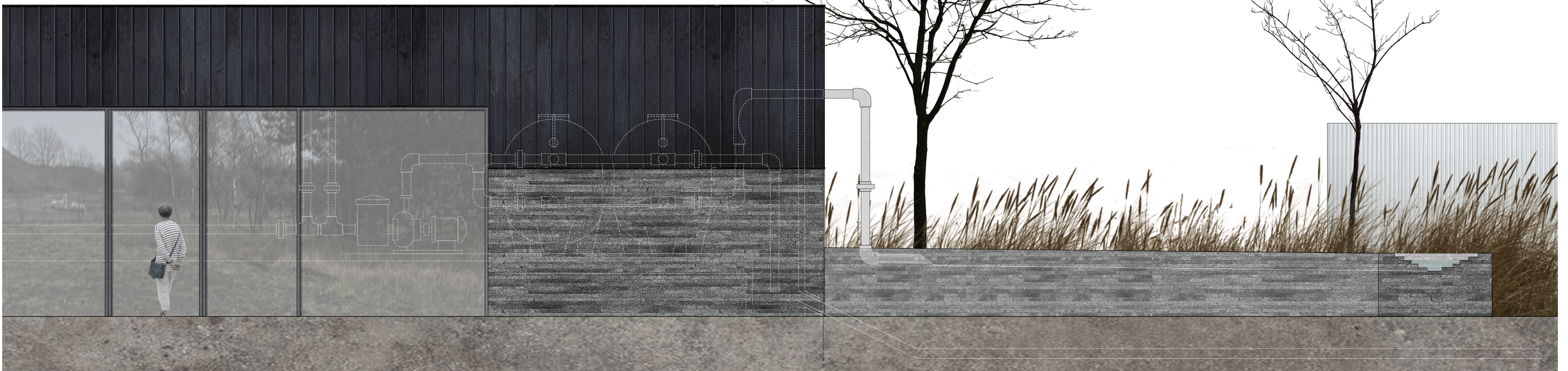
aerial view of the factory site & intervention



view of the watertower & visitor center



continuation of water stream



fragment visitor center & water purification 1:50