Limburg Dross  Future Spatial Forms of Industrial Productive Landscapes
DROSS

Vacant space in the city which is a consequence of defunct economic and production systems or urban sprawl and could benefit from reprogramming.

According to Alan Berger:

“Adaptively reusing this waste landscape figures to be one of the twenty-first century’s great infrastructural design challenges.”
SITTARD-GELEEN
size 1.963 ha  households 15,680  population 32,444

Geleen

residents:
- 32.3% work in Geleen
- 19% work in Sittard
- 14.7% work in Parkstad Limburg
- 11.4% work in Maastricht
STAATSMIJN MAURITS
Staatsmijn Maurits

1926-1967

6,500 miners below ground
2,800 workers above ground

shaft depths: 341/455/548/660/810m

size 5,000 ha
jobs 10,000
length 180km
tons 7mil
1968
CHEMELOT
Chemelot

90+ companies

Research & Development
Start-up
Established Business
Service Provider

large chemical industrial complex

size
800 ha

jobs
6.500

visitors
1.000

Note: start years refer to years when production started. End years refer to closure in the cases of coal and coke, and sale in the case of plastics.
demarcated as “landscape” but its inaccessible...

no integration of campus into structure vision for 2020
chemelot in the background
no real edge condition
romantiscizing the site
Due to the site's mining history, we also have detailed underground mappings of fault lines and other tectonic features. However, much of it was removed to build highways and other large infrastructural works.

The major feature of the site is the man-made hill whose top is formed by the Maas River during the times when it was still allowed to change course. The site, due to its heavy industrial use in the past, has very little "virgin" soil, terrain, or planting. The soil is primarily sandy and silty loam as the site lies in the Maas Valley. The site lies on a terrace formed by the Maas River during the times when it was still allowed to change course.
ELECTRICITY

40% Limburg

NATURAL GAS

4-5% Netherlands
WHITE BIOTECH & BIOECONOMY
TO CREATE A NEW SPATIAL COHESION

TO CHANGE THE RELATIONSHIP OF CHEMELOT TO THE CENTER OF GELEEN

TO CREATE A PRODUCTIVE PERFORMATIVE LANDSCAPE FROM WASTED SPACE
(that used to produce 700 million kWh/yr)

ECOLOGICAL

phytoremediation
phytodemarcation

SPATIAL

expand the green network of the city
establish new civic space

RECREATIONAL

connect existing paths
add recreational space for all age groups

PRODUCTIVE

energy
biomass
1. civic axis
   - Reconnect the campus and the city to encourage exchange

2. campus and city
   - Redvelop the industrial zone into new mixed use and civic space

3. fragmented landscapes
   - Connect vacant landscapes into one large system of productive and recreational spaces

4. city center
   - Remove highrise blocks replace with properly scaled mixed use to open up access to market

5. energy production
   - Use the site for energy production once again: rebuild on the former mining site
1. SPATIAL - URBAN DESIGN
2. CONNECTION - LANDSCAPE
3. ENERGY PRODUCTION

EXISTING PLANS FOR THE AREA
EXISTING SITUATION
We tend to categorize our descriptions of nature into three types: the garden and park (first nature), agricultural lands and pastures (second nature), and wilderness (third nature).

1st nature: private gardens, city park
2nd nature: city orchard, meadows, biomass fields
3rd nature: CO2 compensation forest, agro-forest
1st nature - neighborhood park

2nd nature - biomass

3rd nature - coppice forest
INSPIRATION - mining maps
FAULT LINES AND COAL SEAMS
FAULT LINES AND COAL SEAMS
LANDSCAPE - faults
LANDSCAPE - axis shift
Limburg walking routes

Green metropolis routes

Train stations and bus line connections

Official bike routes
MUNICIPALITY

companies

companies

masterplan

designers

transport

facilitators

energy

producers

employees

researchers

engineers

power company

planners

business
groups

housing
corporations

business
groups

land
owners

developers

local
initiatives

residents
EXISTING SITUATION - 2014
Swales to filter storm runoff

Transition between housing and landscape

City fruit and nut orchard

Meadows under powerlines with paths mown through
Proposed transitional zone between the city and the space under the powerlines
EXISTING SITUATION

- median one way road
- bike path
- parking
- trees
- sidewalk
- vacant lot

NEW SITUATION

- median
  - 1.70m
  - 4.0m
  - 1.5m
  - 2.0m
  - 3.0m

- new house
- private garden
- Malus spp.
- Pyrus spp.
- Prunus spp.
- Juglans regia
- telephone
- storm sewer
- water main
- main sewer
- electricity
- gas
- one way road
- bike path
- parking and trees
- sidewalk
- new building
- city orchard
- meadow
- mown path
EXISTING SITUATION
median one way road bike path parking and trees sidewalk vacant lot

NEW SITUATION
median 1.70m 4.0m 1.5m 2.0m 3.0m

- new house private garden
- telephone storm sewer water main
- electricity gas hot and cold district heating
- main sewer
- one way road bike path parking, swale and trees sidewalk
- new building

...
EXISTING SITUATION
median one way road bike path parking and trees sidewalk vacant lot

NEW SITUATION
median 1.70m 4.0m 1.5m 2.0m 3.0m new house private garden Malus spp. Pyrus spp. Prunus spp. Juglans regia telephone storm sewer water main main sewer electricity gas hot and cold district heating

new house private garden city orchard meadow mown path
Planting for bioswales:

- Angelica sylvestris
- Butomus umbellatus
- Typha latifolia
- Lotus pedunculatus
- Filipendula ulmaria
- Galium palustre
- Centaurea jacea
- Valeriana officinalis
- Lathyrus pratensis
- Cardamine pratensis
- Ranunculus flammula
- Veronica beccabunga

Asphalt surface course 4cm
Slope 5% to swale
Asphalt base course 10cm
40cm compacted aggregate
Existing soil, compacted

Concrete curb 10cm with intermediate cuts
Set in foundation
15cm check dam
45cm soil prepared for planting
Filter fabric
30cm aggregate
Ø 15 cm perforated PVC drain pipe

Sloped concrete curb 10cm
Set in foundation
30x30cm concrete pavers
10cm sand foundation
40cm compacted aggregate

2m
Direct connection of the city to the park

Park with large trees - solitaires or groups

Wildflower meadows encircling lawns

Phytoremediation of polluted soils
phyto extraction
Helianthus annuus
Agrostis castellana

phyto stabilization
Brassica juncea
Triticum aestivum
Agropyron cristatum

phyto degradation
Armeria maritima
Salix viminalis and others
Populus deltoides
1st generation

Zea mays
Brassica napus
Beta vulgaris
Triticum estivum

2nd generation

Agroforestry-poplar, robinia, birch
Short rotation coppice-poplar, robinia, birch
Panicum virgatum
Miscanthus x giganteus
Zea mays
+2.0
Robinia pseudoacacia
Brassica napus

* all fields with maximum 6% slope

Triticum aestivum
Brassica napus

+1.0
1:1 slope

+0.0
+1.0
+2.0
+1.0
+0.0
-1.0
3 m

* all fields with maximum 6% slope
Transition from biomass fields, with axes formed by fault lines, through an ecological houtwal, to the production forest behind.
PHASE FOUR - REDEVELOPMENT COMPLETE - 2030
Water as a feature

Reflection of the hill in water

Campus path network and open space

Agrarian ideal
Transition from the Chemlot campus to the OPAC reservoir
kebonized wooden decking 15cm boards
reservoir basin 20cm poured in place concrete
40cm compacted aggregate
existing soil
soil for planting 45cm
max. water level
min. water level
water lilies
water hyacinth
wild celery
hard stem bulrush
pickerelweed
burreed
soft-stem bulrush
pickerelweed
flowering rush
reed
yellow iris
cattail
woolgrass
concrete paver
water depth 100cm
water depth 55-100cm
water depth 25-55cm
water depth 0-25 cm
water delivery shaft
drain cover
CHEMELOT

- increase in campus quality will attract more companies
- greater connection to Geleen, feels less isolated
- chance to advertise changing practices to the world

RESIDENTS

- access to higher quality green space
- connection of walking routes in the area
- city park on their doorstep
- increase in housing values

GELEEN

- chance to redevelop a dying area
- attract new residents and businesses
- increase quality of life
- work towards a sustainable city
corn and corn stover et al. biomass to produce 307,200 MWh/yr need 4.388 more ha within 50 km or to produce 100,000 tons biomass (38 million liters ethanol) for economy of scale need 23.431 ha or 10% of Limburg agricultural land within 50 km.