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How to deal with residential areas and
areas of public use in the vicinity of
Seveso establishments

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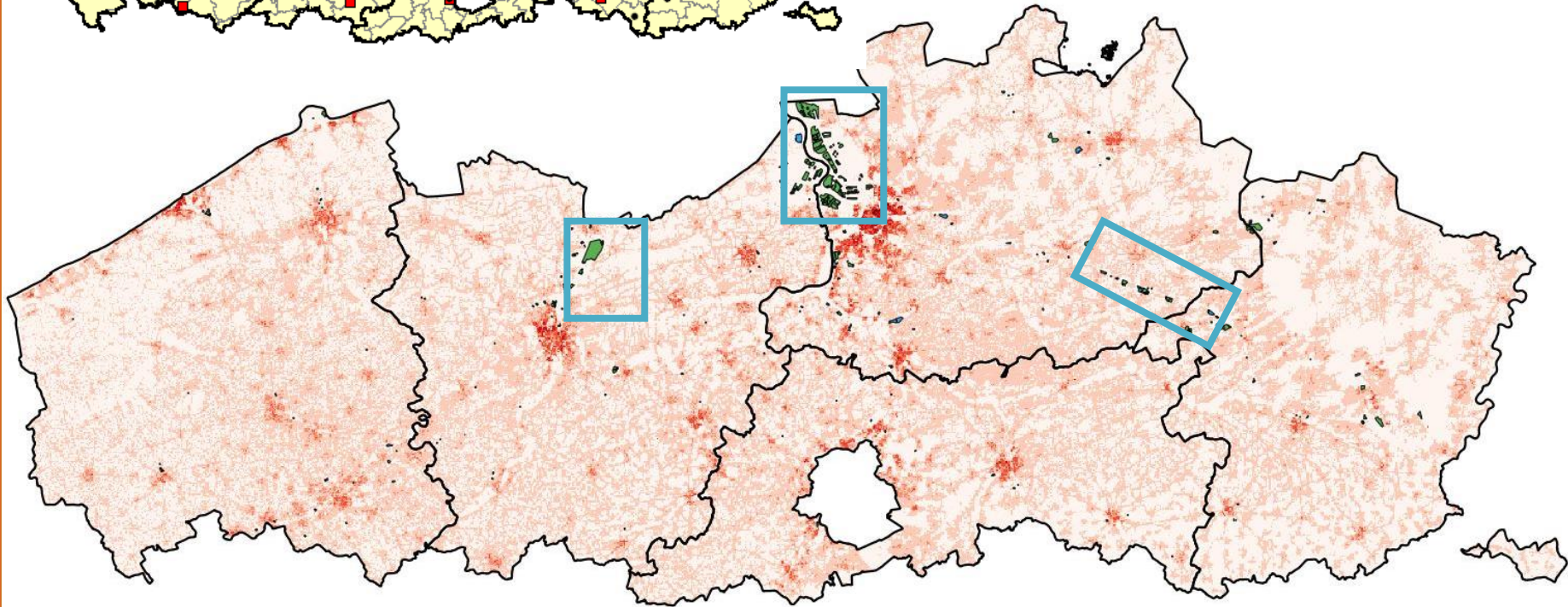
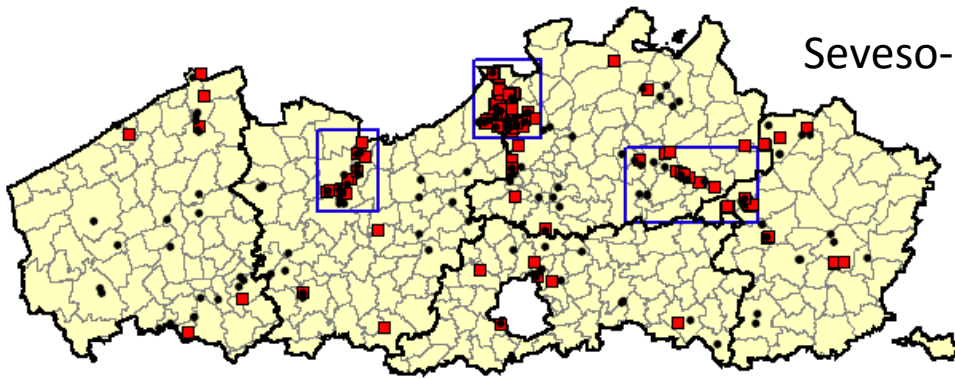
DEPARTEMENT
OMGEVING



Flanders (Belgium): situation

- ▶ Dense population, dense road and railway network
- ▶ 164 uppertier Seveso establishments
- ▶ 118 lowertier Seveso establishments
- ▶ Concentrated in 3 areas
 - × Port of Antwerp
 - × Port Ghent
 - × Albert canal
- ▶ Rest dispersed

Seveso-establishment (lower/higher tier)

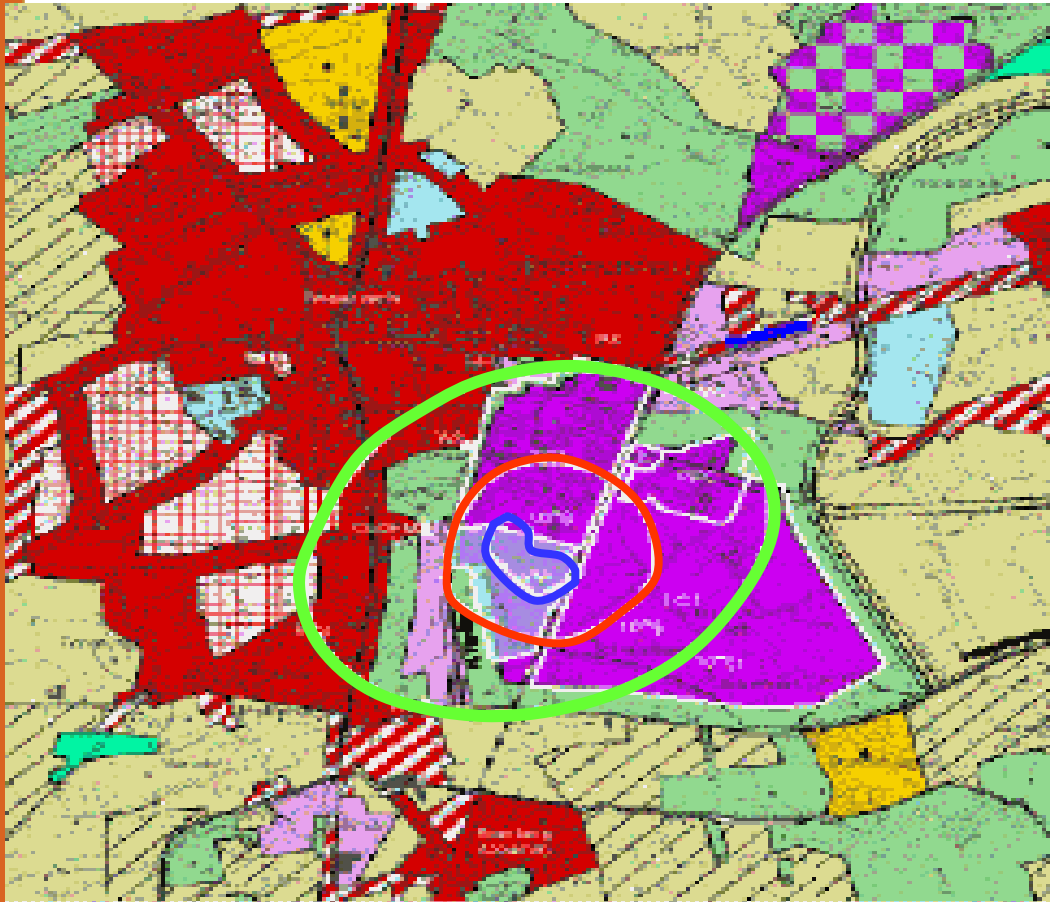


Concentration of population versus Seveso-establishment



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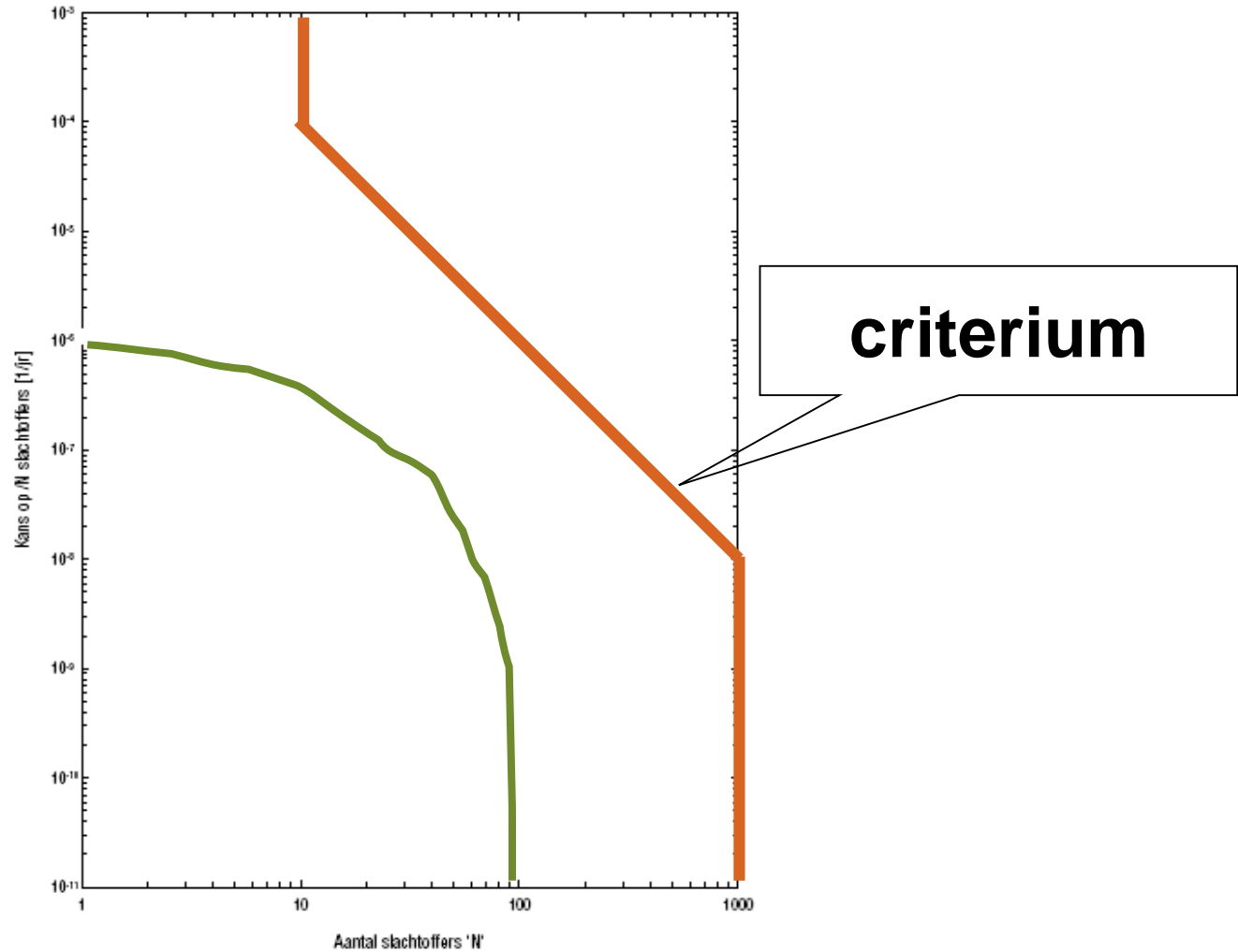
Flanders: criteria - IRC



Risk Acceptability	IRC
Border of the establishment	$10^{-5}/y$
Border of residential area	$10^{-6}/y$
Border of area containing vulnerable location	$10^{-7}/y$



Flanders: Criterium – Societal Risk (SR)



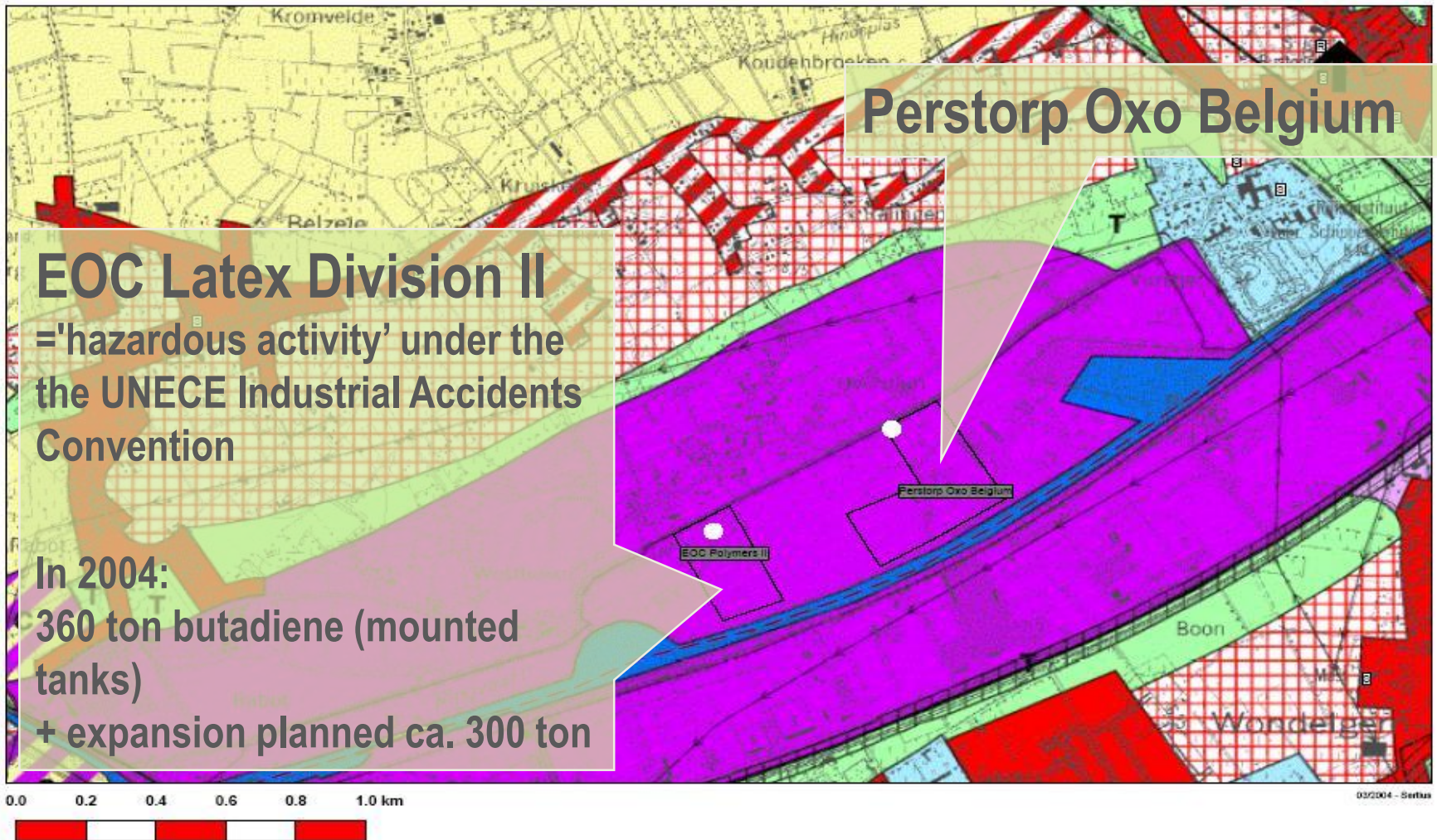
Areas of special attention

- Residential areas (IRC 10^{-6} /y and SR)
 - Residential zoning
 - Group of at least 5 dwellings in non-residential zoning
- Areas with a vulnerable location (IRC 10^{-7} /y and SR)
 - Schools (< 18 years)
 - Hospitals
 - Retirement homes
- Buildings and areas of public use, recreational areas (SR)
- Major transport routes (probability/effect)
- External sources of danger (probability)
- Areas of particular natural sensitivity or interest (effect)

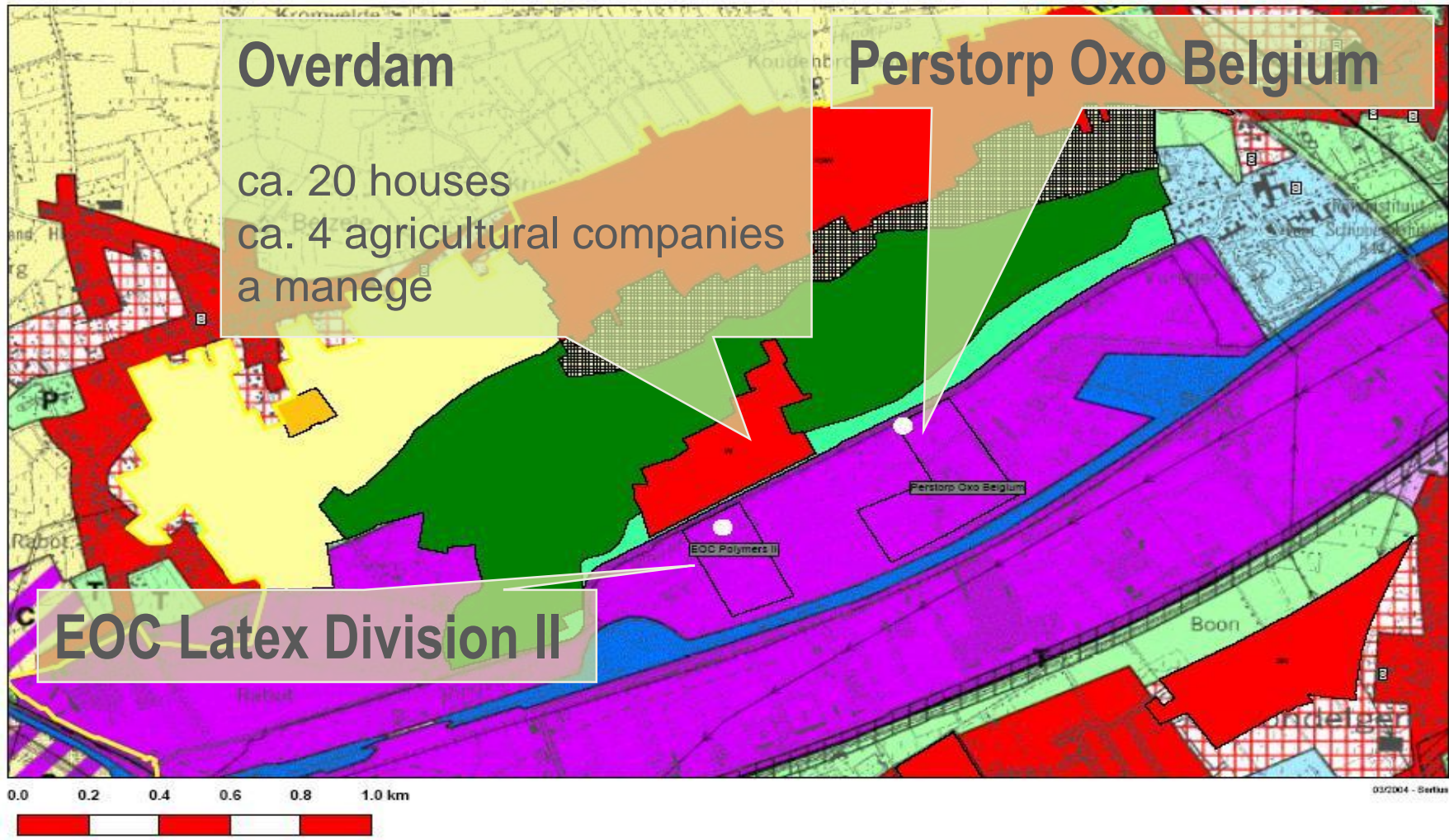
Case 1 (2004)

Residential area nearby Seveso establishments

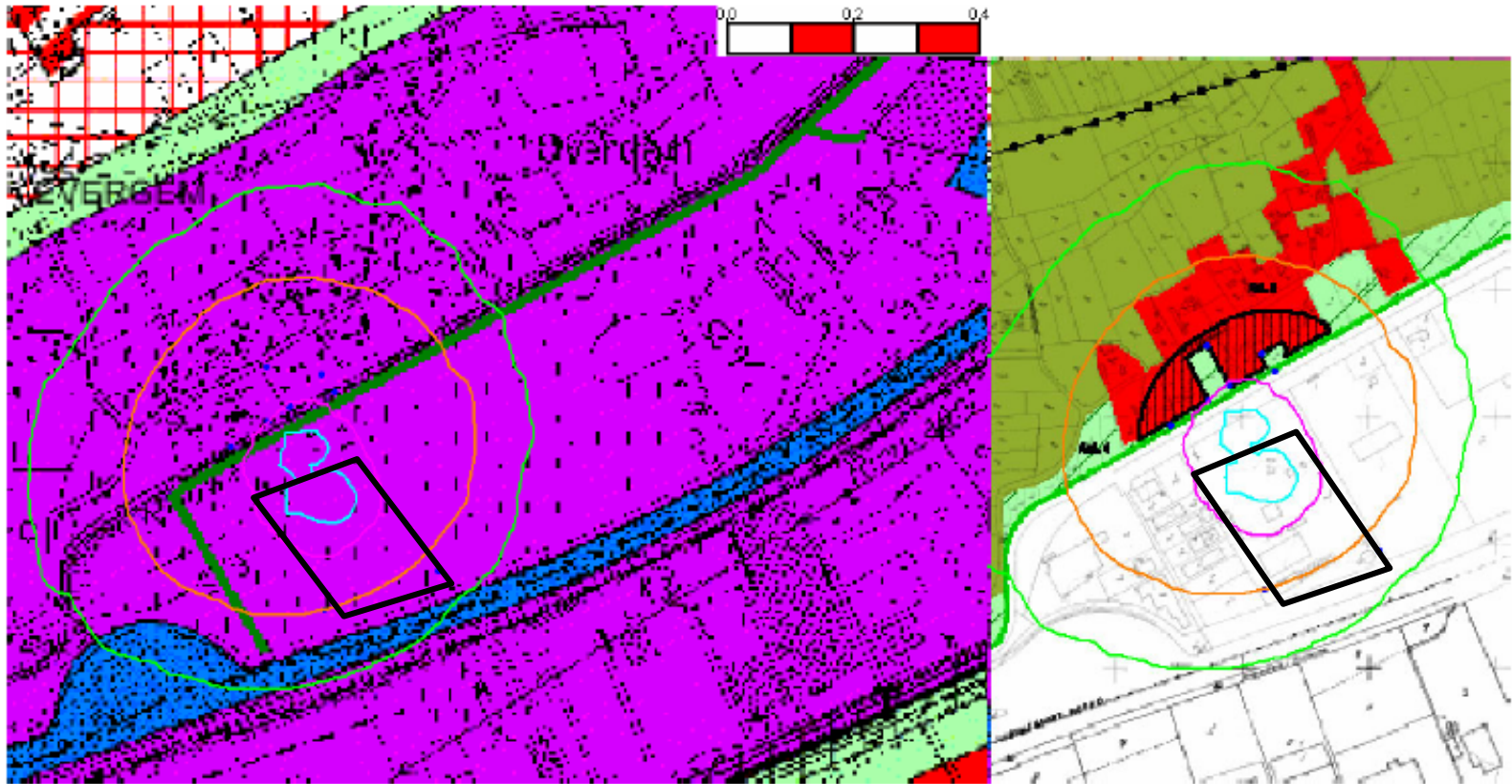
Residential area nearby Seveso



Residential area nearby Seveso



Historical situation versus LUP proposal



10-4/jaar

10-5/jaar

10-6/jaar

10-7/jaar



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Conclusion case 1

- ▶ **Results in Spatial Safety Report**

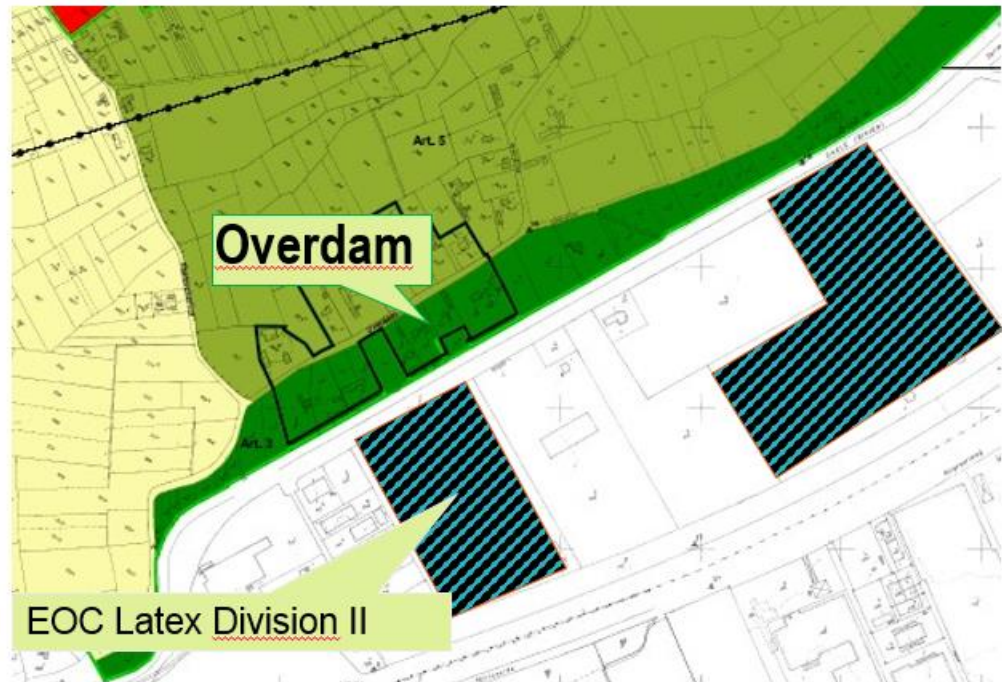
- ▶ **Decision**

- No residential area in LUP

- In period of 10 years no houses in area within $IRC = 10^{-6}/\text{year}$

- ▶ **Result**

- Safe situation





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Case 2 (2017)

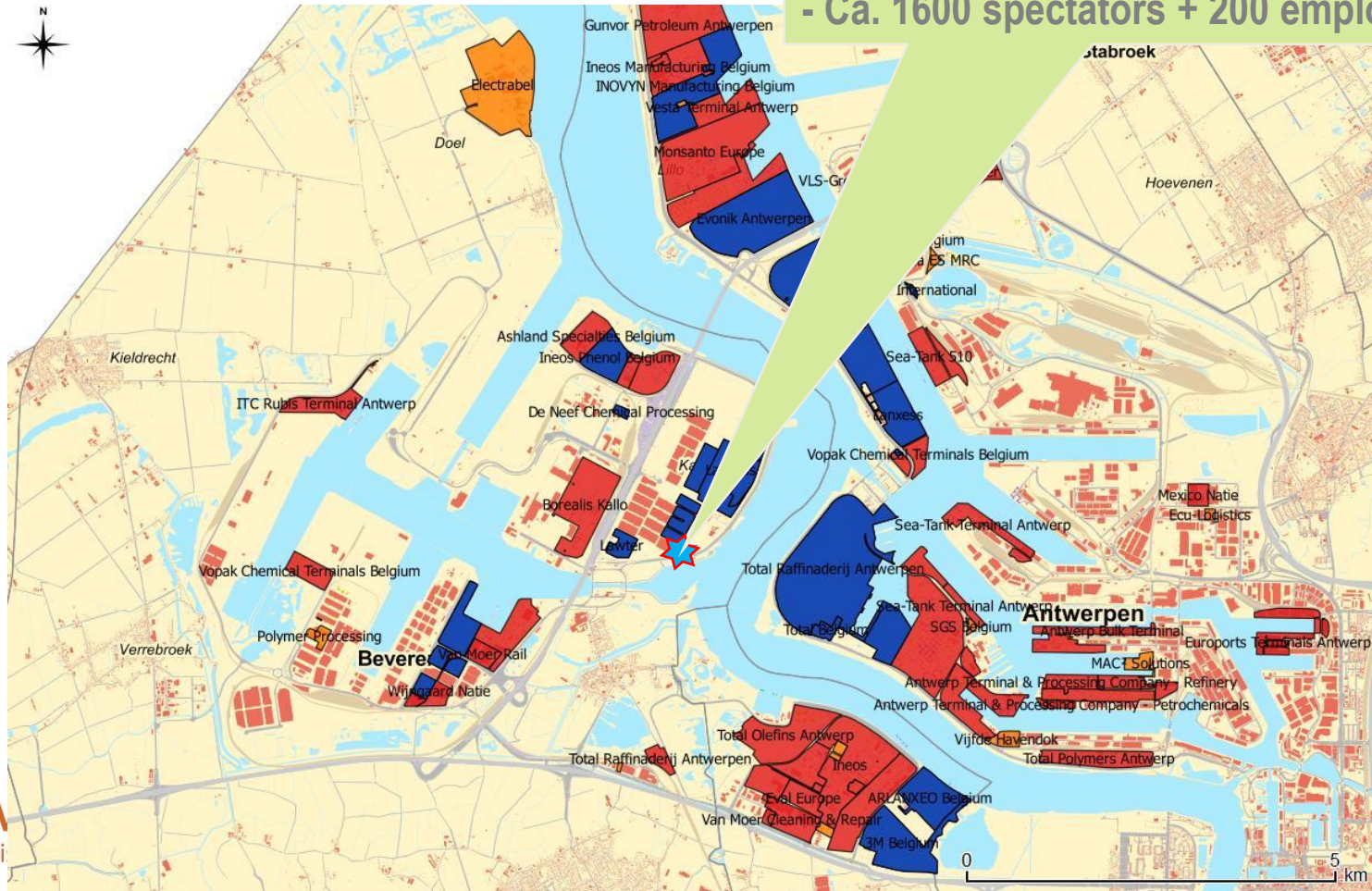
Theater performances nearby Seveso establishments

Theater performances nearby Seveso establishments

► In Port of Antwerp

Theater performances

- Period of 2 years (from wed. till sunday)
- Ca. 1600 spectators + 200 employees



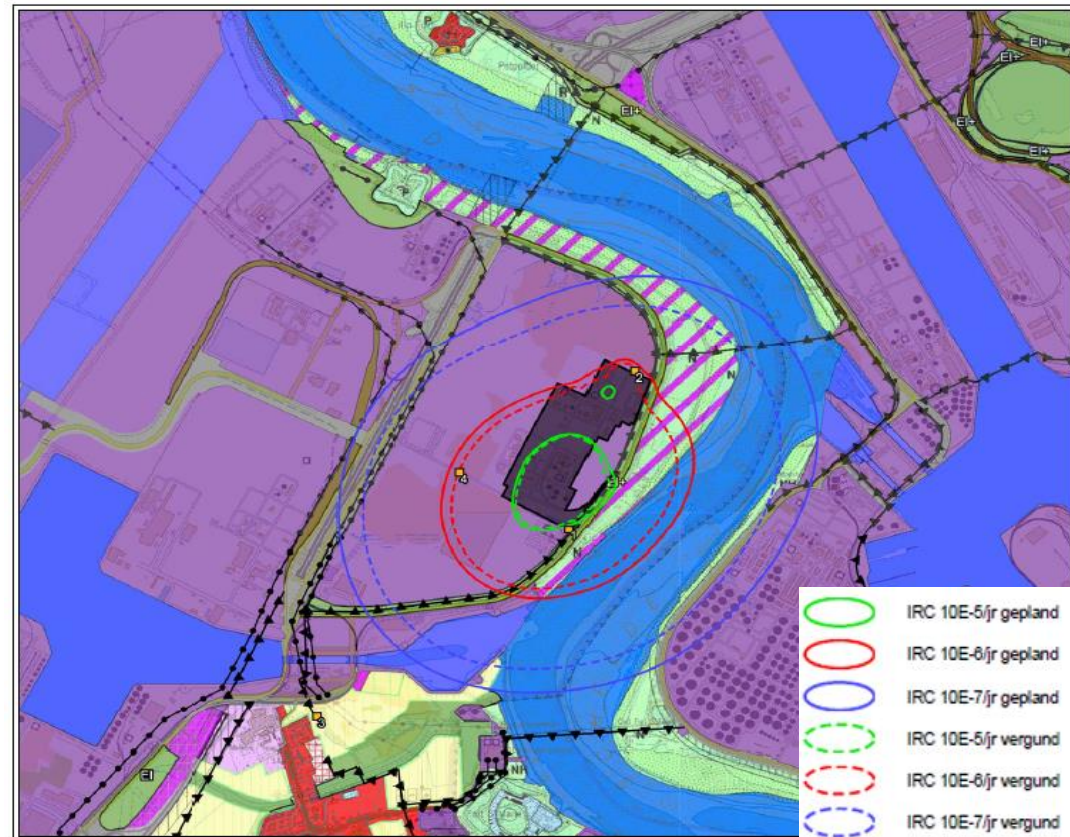
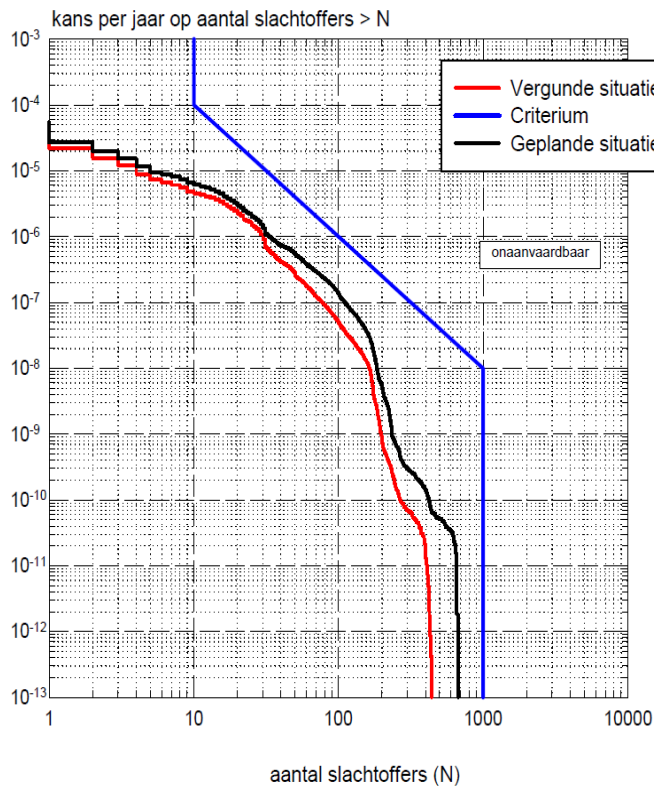
Theater performances nearby Seveso establishments

► Risks

- Nearest Seveso-establishment: 20m
- 21 Seveso-establishments with 1%-lethality-distances over the specific location
 - × 16 establishments with toxic substances
 - × 18 establishments with flammable substances
 - × 21 establishment with ecotoxic substances
- > those establishments containing hazardous substances are defined as a 'hazardous activity' under the UNECE Convention on the Transboundary Effects of Industrial Accidents
- Storage & handling Chlorine within 500 m



Theater performances nearby Seveso establishments



Conclusion case 2

▶ Technical advice

- No appropriate safety distance between Seveso establishment and area of public use
- Augmentation of consequences of a major accident

▶ Result

- New location = Safe situation

Lessons Learned

Land use planning

▶ Use of Spatial Safety Report

- Examination
- proposal of solutions

▶ Technical advise specific for

- New rule since jan. 2018: technical advice for act within the framework of building permits

▶ Challenges

- How to deal with events/festivals (like Tomorrowland, ...)
- Developing a quick scan method to evaluate the impact of off-site developments on the societal risk of Seveso establishment