

eNoses to sniff the environment



September 14, 2023

About Comon Invent



Company details

Comon Invent BV

Founded: 1995

Delft, the Netherlands

2023

2000+ eNoses

100+ eNose networks

25+ Countries

Simon Bootsma

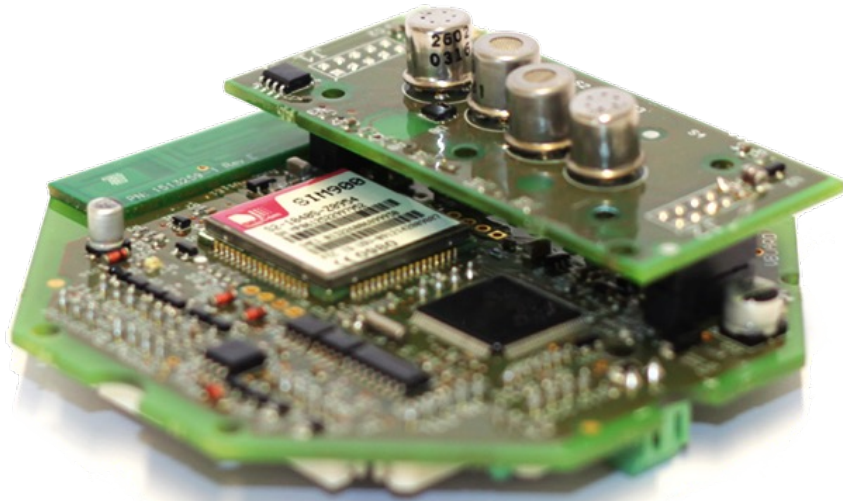
comon

 invent

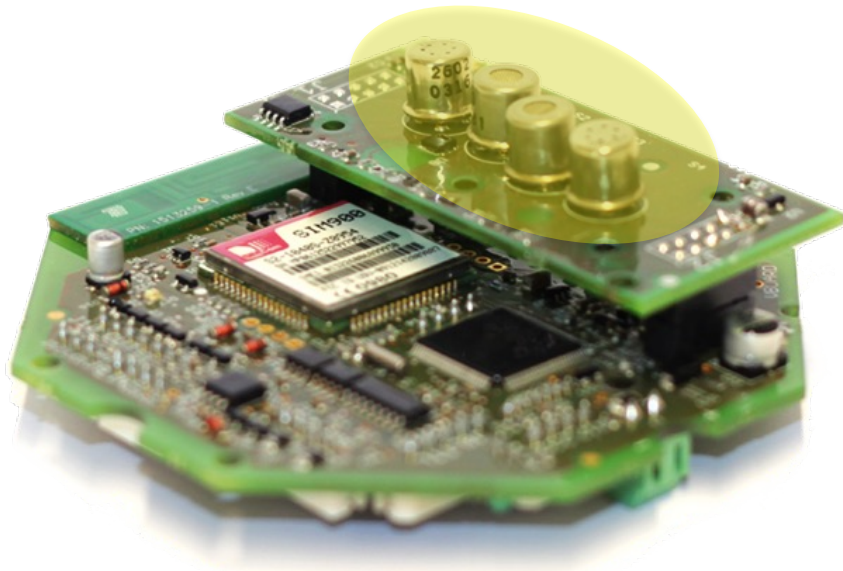
Launching customer 1998



Electronic Nose concept



Electronic Nose concept

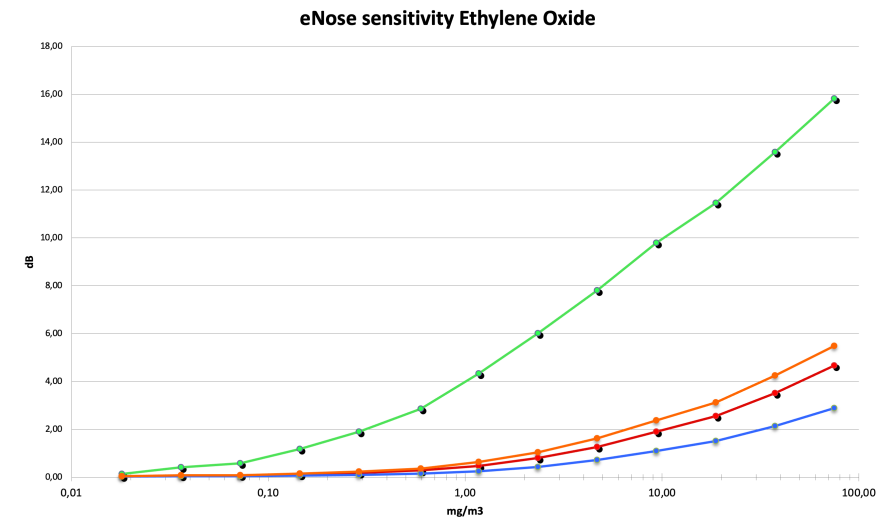
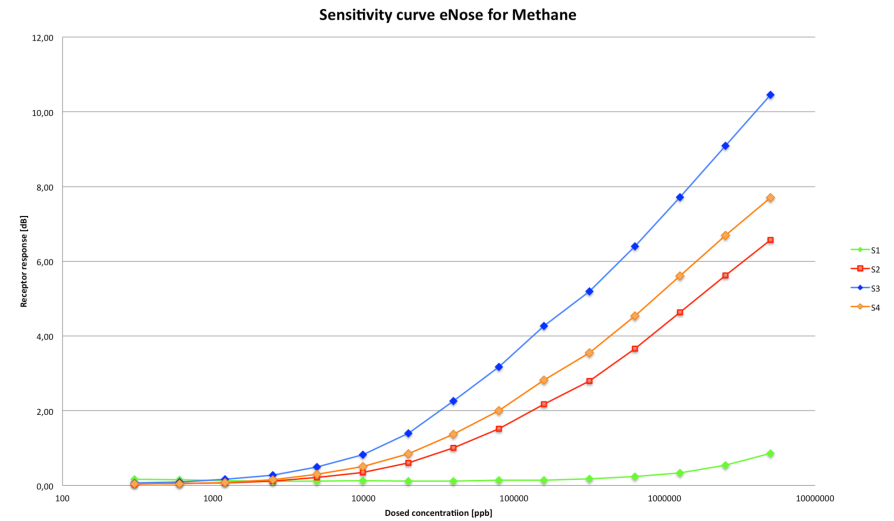
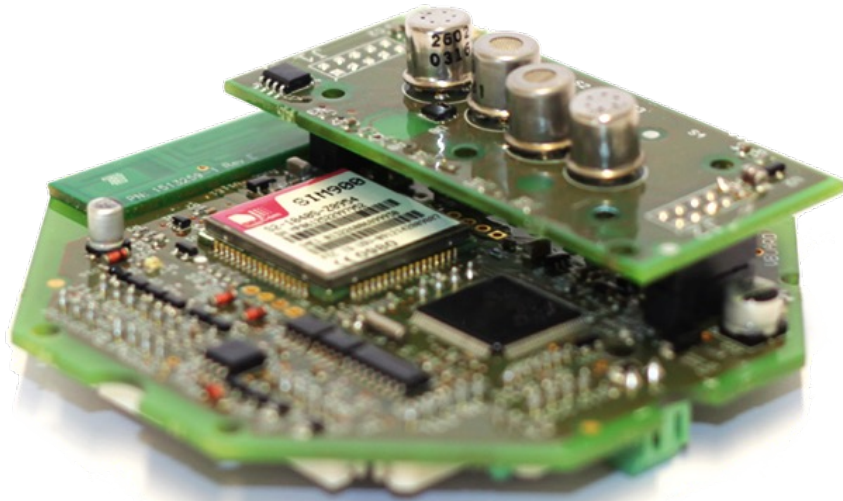


Sensor array

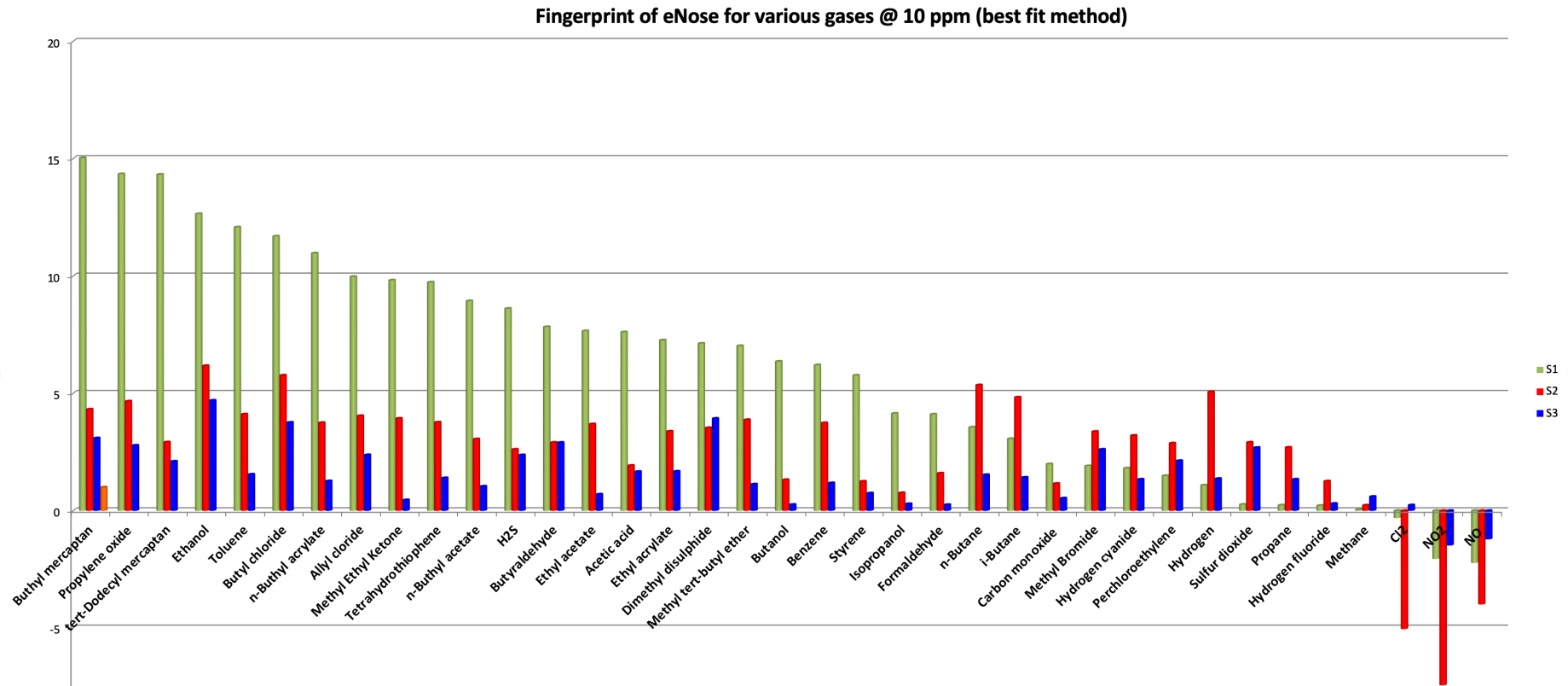
4 broad spectrum gas sensors

- each sensor responsive to reactive trace gases
- Large dynamic range - ppb - vol%
- Sensor robust: lifetime > 5 years
- No need for periodic calibration
- online drift compensation
- onboard humidity & temperature sensor for cross sensitivity correction.

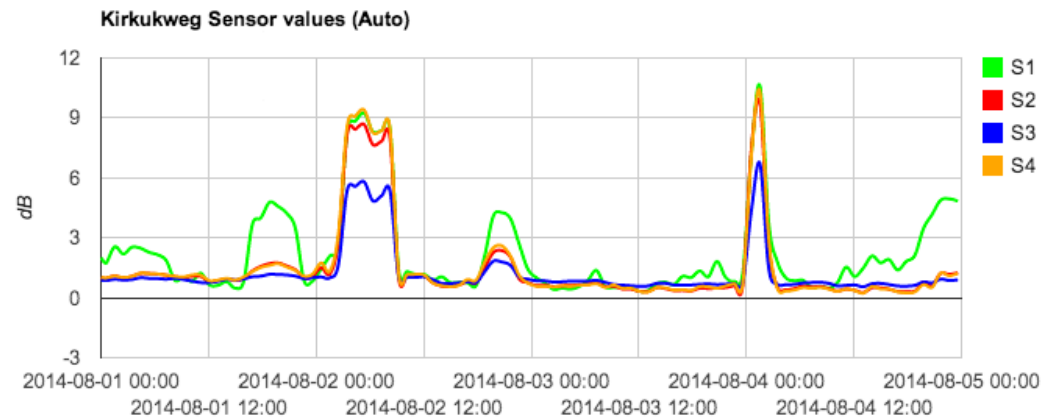
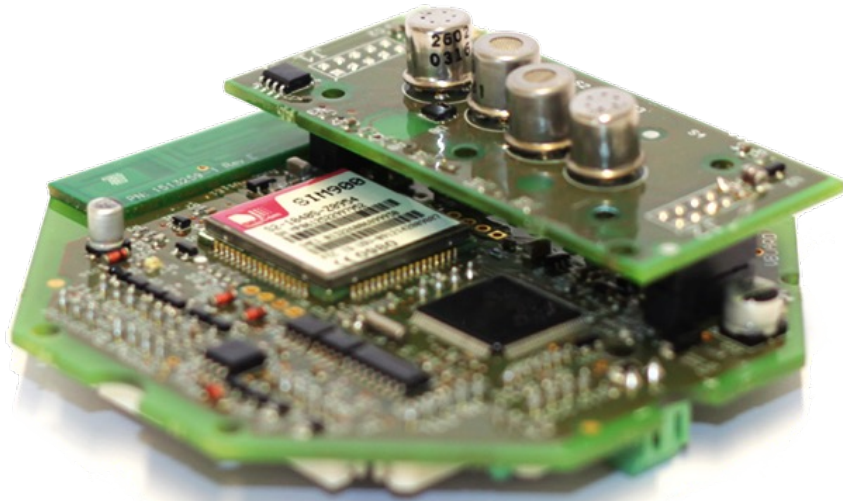
Electronic Nose concept: Pattern recognition



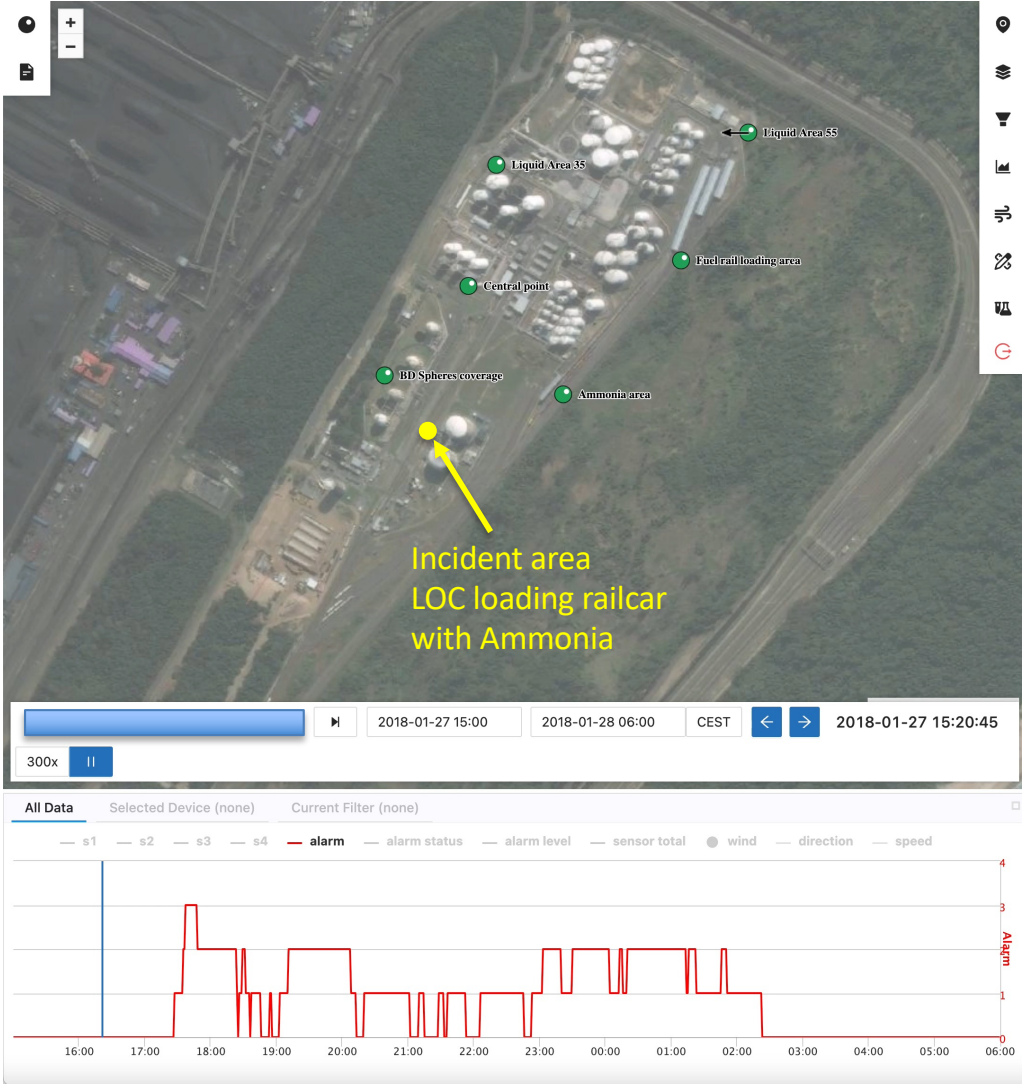
Electronic Nose concept: Finger print Library



Electronic Nose, eNose: Online



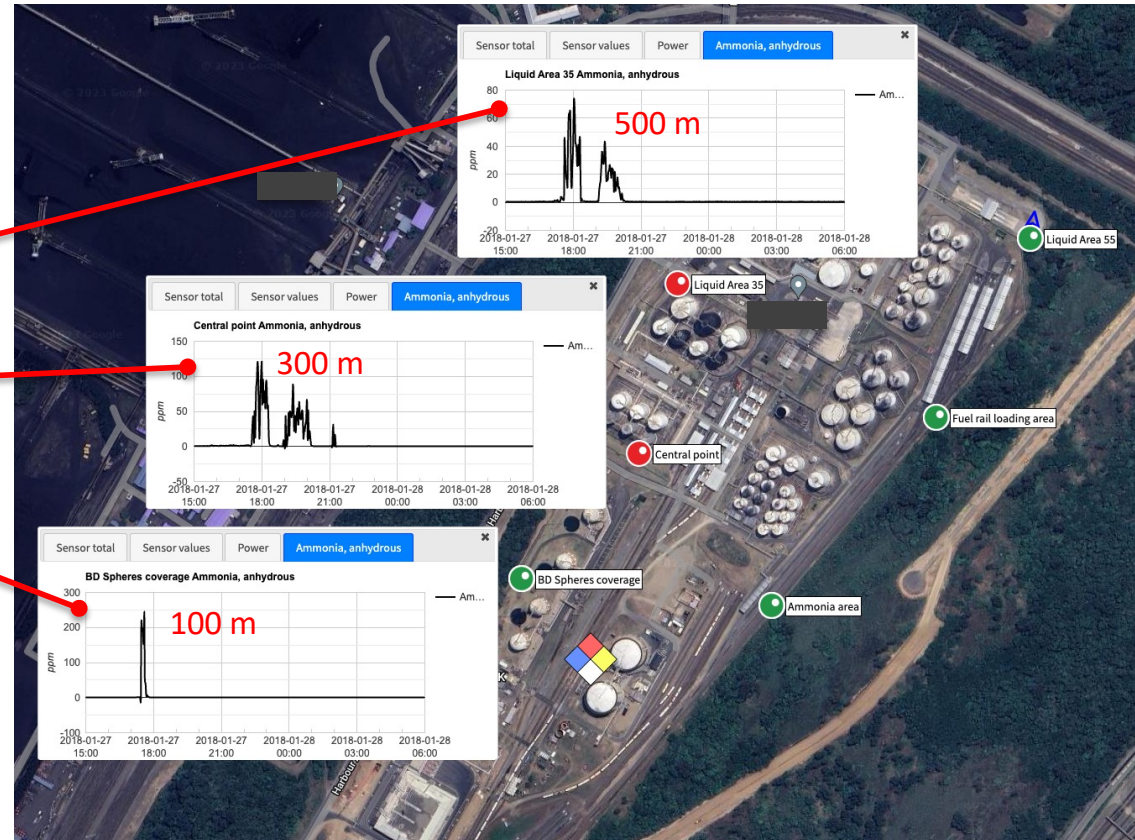
Case: Ammonia leak



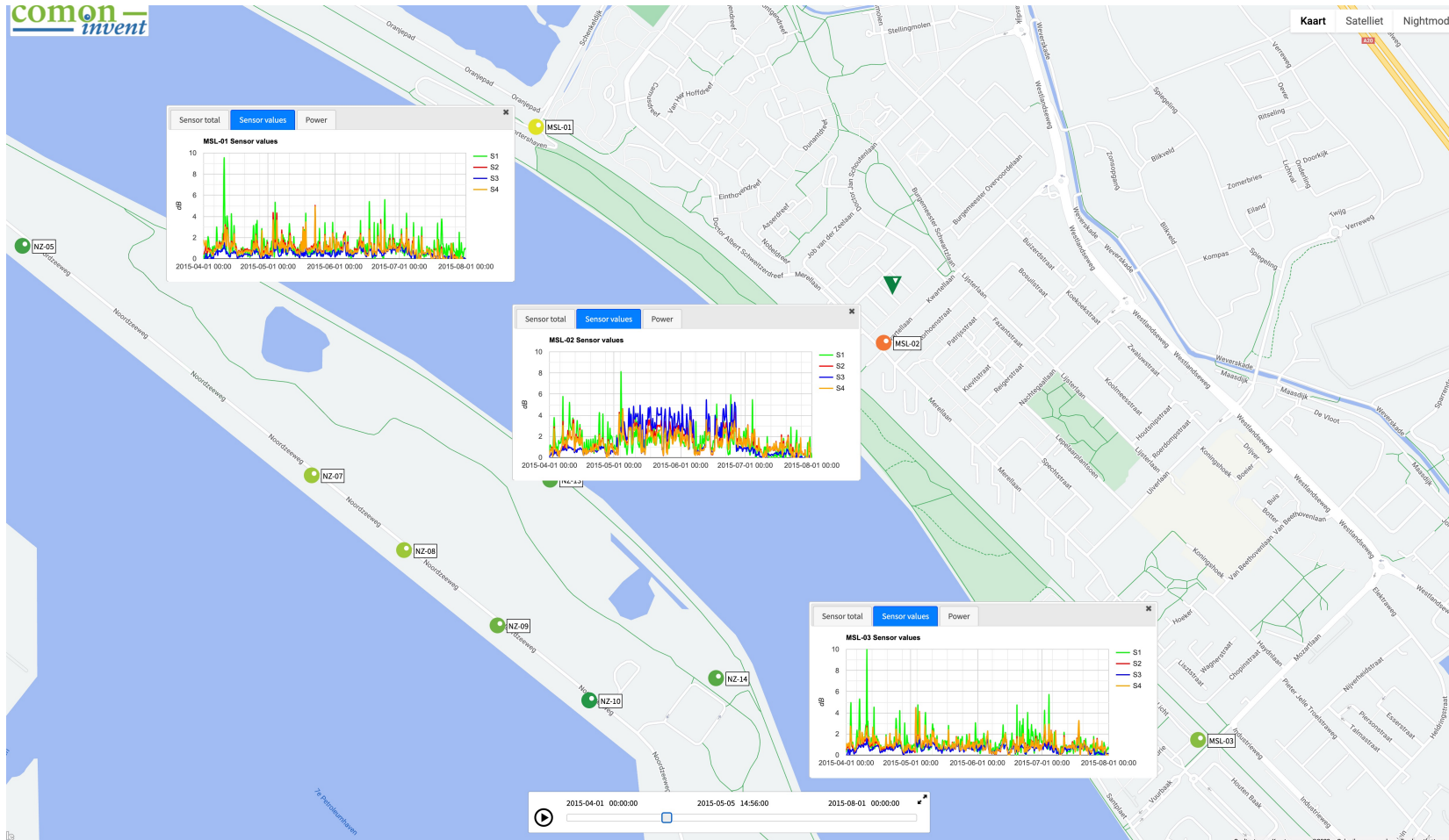
Case: Ammonia leak

Ammonia concentration in air (ppm)	Health Symptoms
< 25	Detectable by smell. Maximum Permissible Exposure Limit (PEL) ¹
30	Uncomfortable, breathing support required. Maximum exposure 15 minutes ¹
50	OSHA ² maximum exposure limit
100	Irritated eyes, throat and mucous membranes. Mild eye nose and throat irritation. May develop tolerance in 1-2 weeks with no adverse effects.
140	Moderate eye irritation, no long-term effect in exposures of less than 2 hours
400	Moderate throat irritation. Damage of mucous membranes with more than 1 hour exposure
500	Immediate danger to life limit (IDLH)
1.000	Caustic to airway
1.700	Fatal after short exposures - less than half an hour
> 15.000	Immediate hazard to life
160.000 - 170.000	Full body protection required

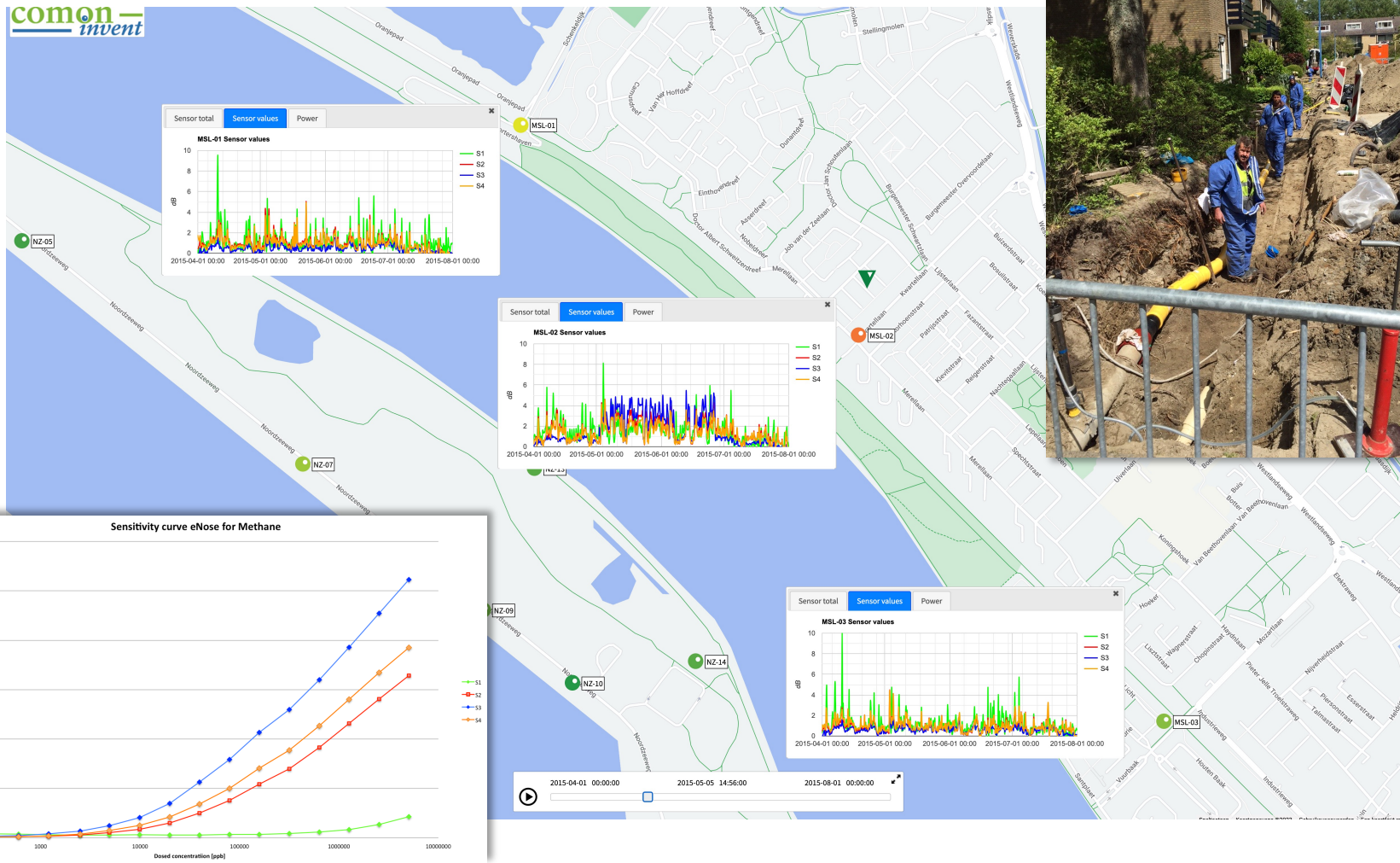
- ¹ ACGIH - American Conference of Industrial Hygienists
- ² OSHA - Occupational Safety and Health Administration



Case: Methane

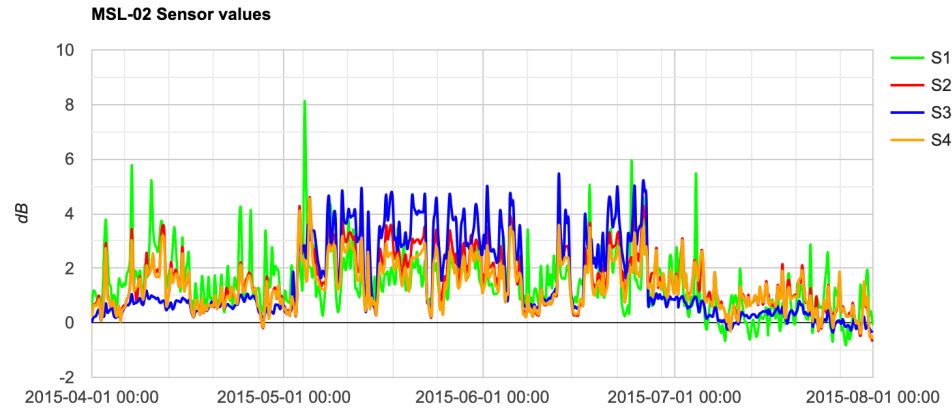


Case: Methane

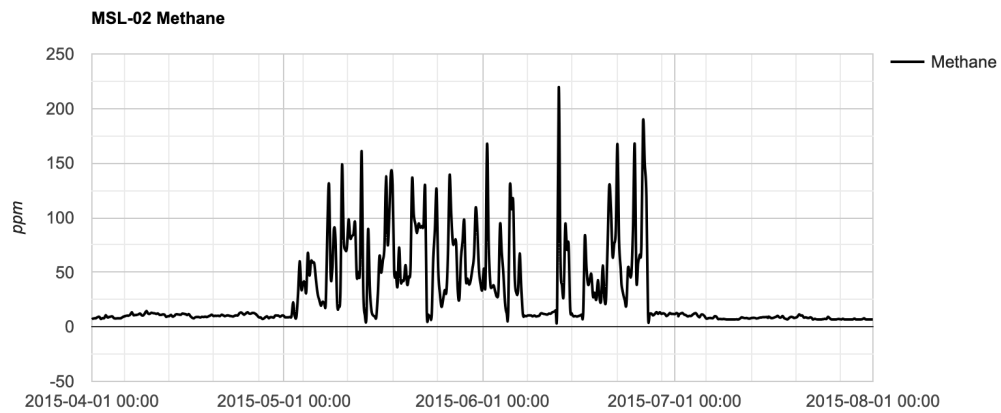


Case: Methane

Sensor total **Sensor values** Power Methane



Sensor total Sensor values Power **Methane**

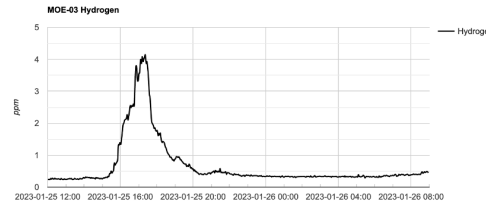


Case: Hydrogen



Case: Hydrogen

40 km



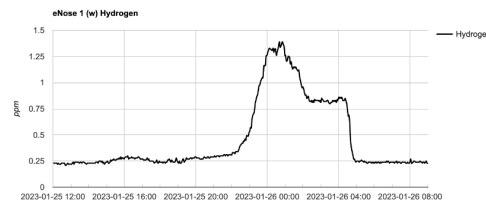
4 ppm

130 km



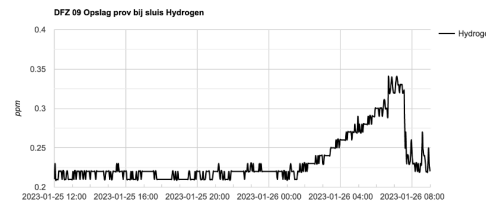
2 ppm

190 km



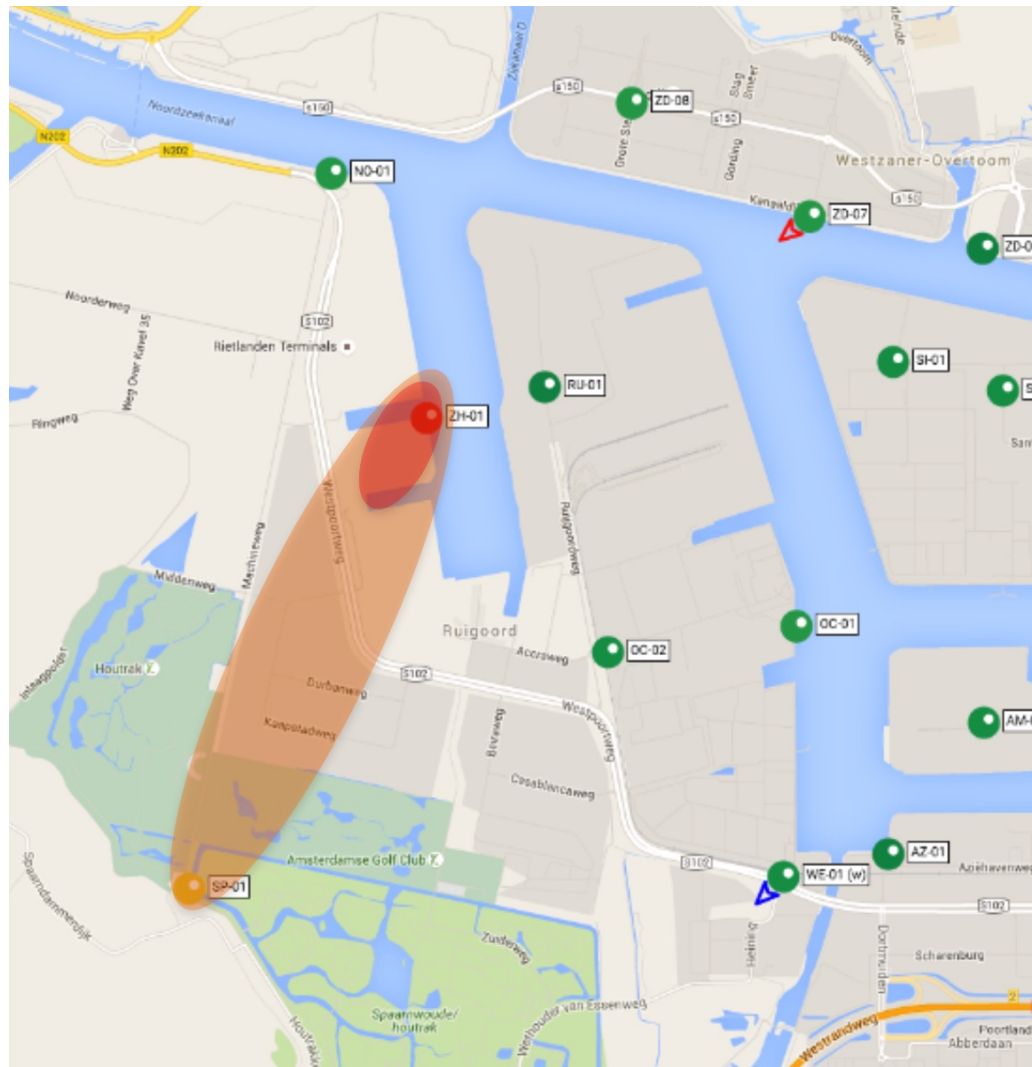
1 ppm

280 km

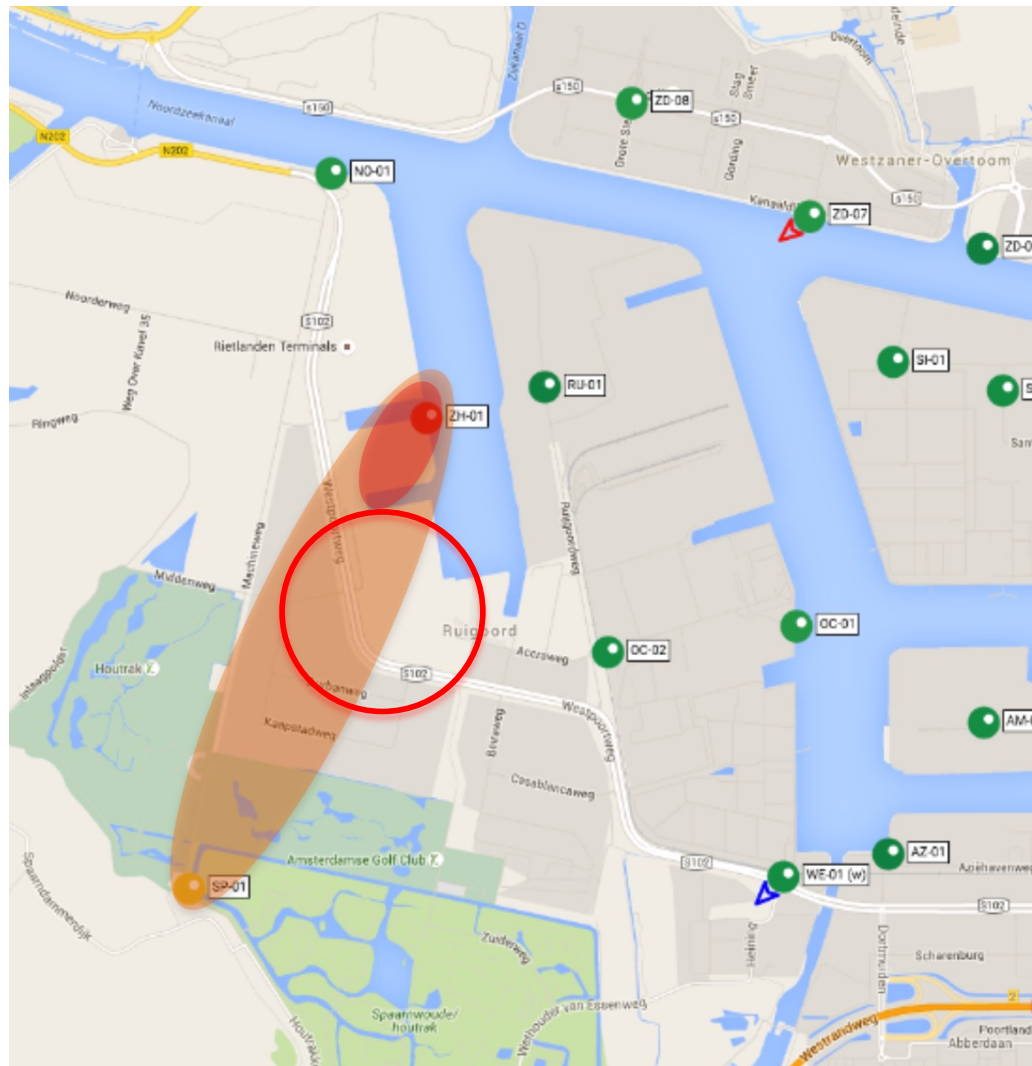


0.2 ppm

Case: Naphtha



Case: Naphtha



Case: Naphtha



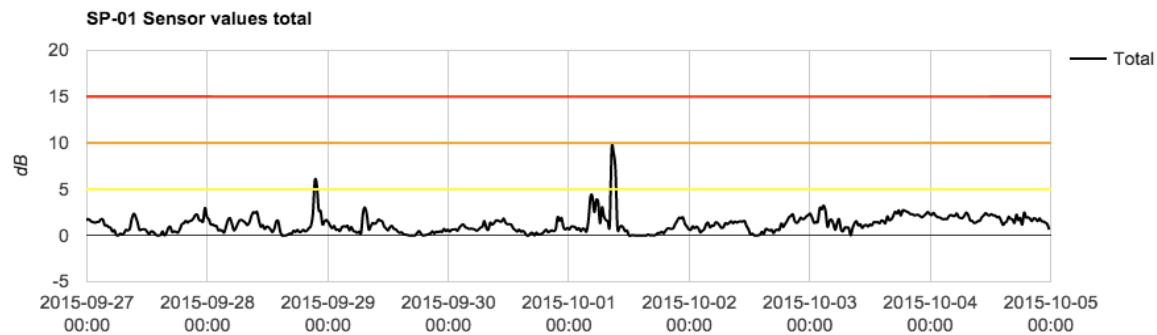
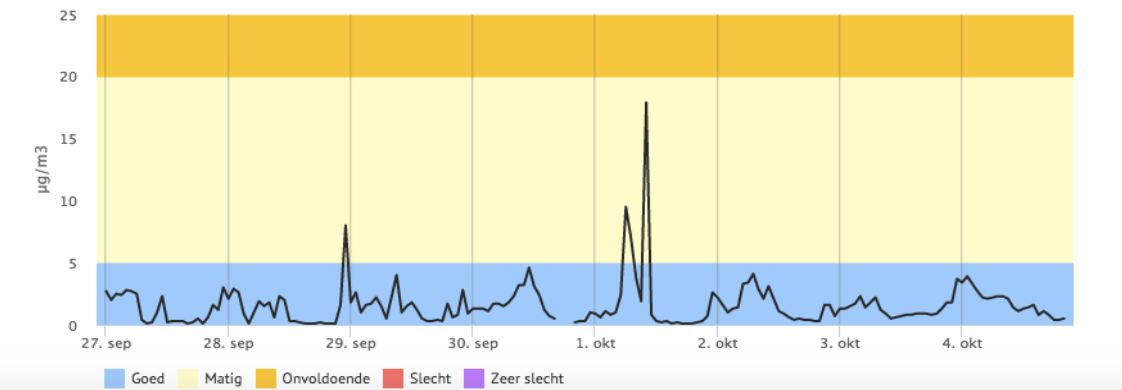
Case: Naphtha

Spaarnwoude

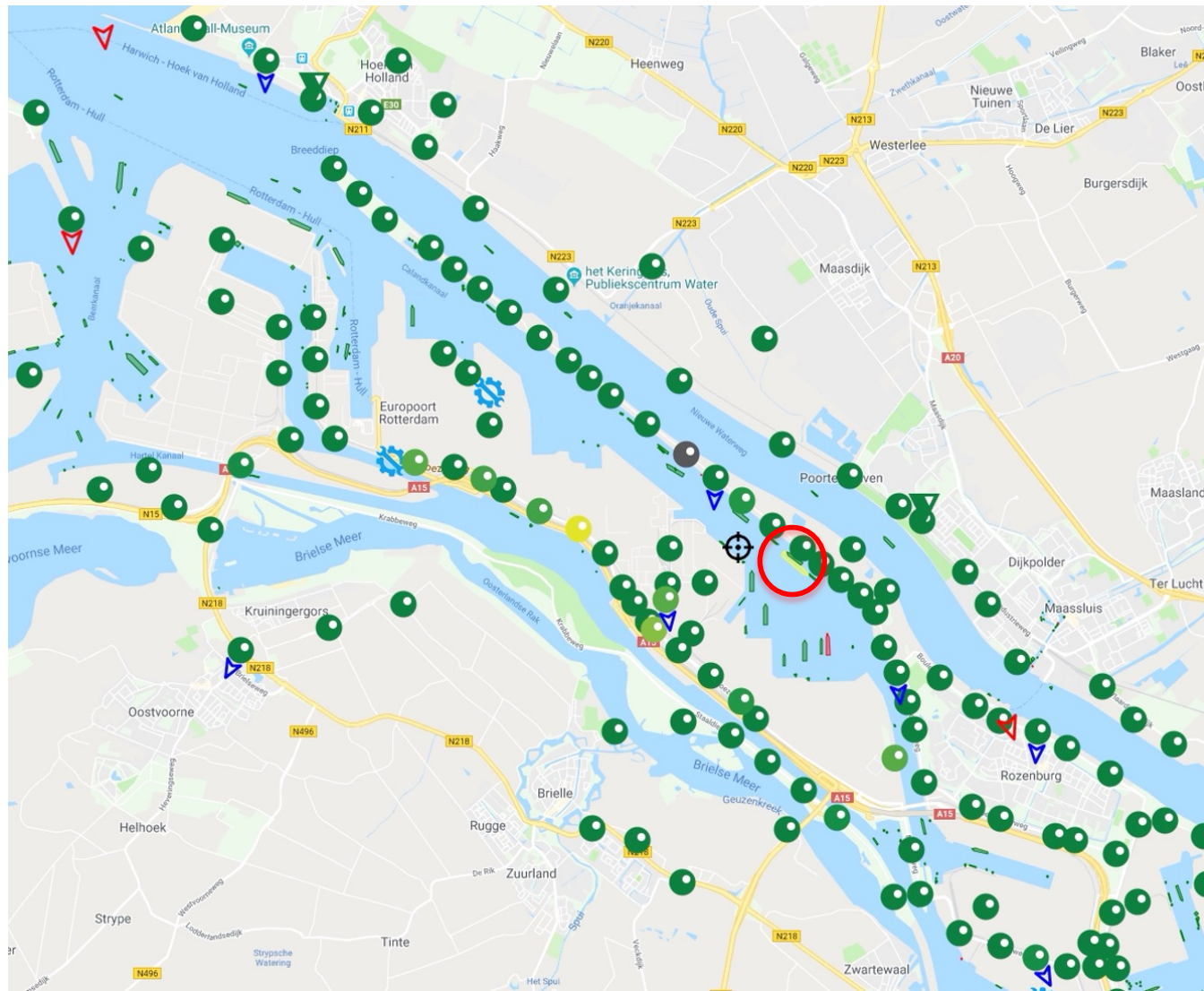
Meetstation Spaarnwoude is een achtergrondstation. Op deze locatie wonen geen mensen en wordt de luchtkwaliteit voor een deel bepaald door de uitstoot van de industrie in de haven van Amsterdam. In opdracht van het Havenbedrijf Amsterdam meet de GGD Amsterdam hier de luchtkwaliteit.

NO2 NO PM10 PM2.5 **Benzeen** Tolueen Tabel

Uurwaarden Week 40, 2015 Toon selectie

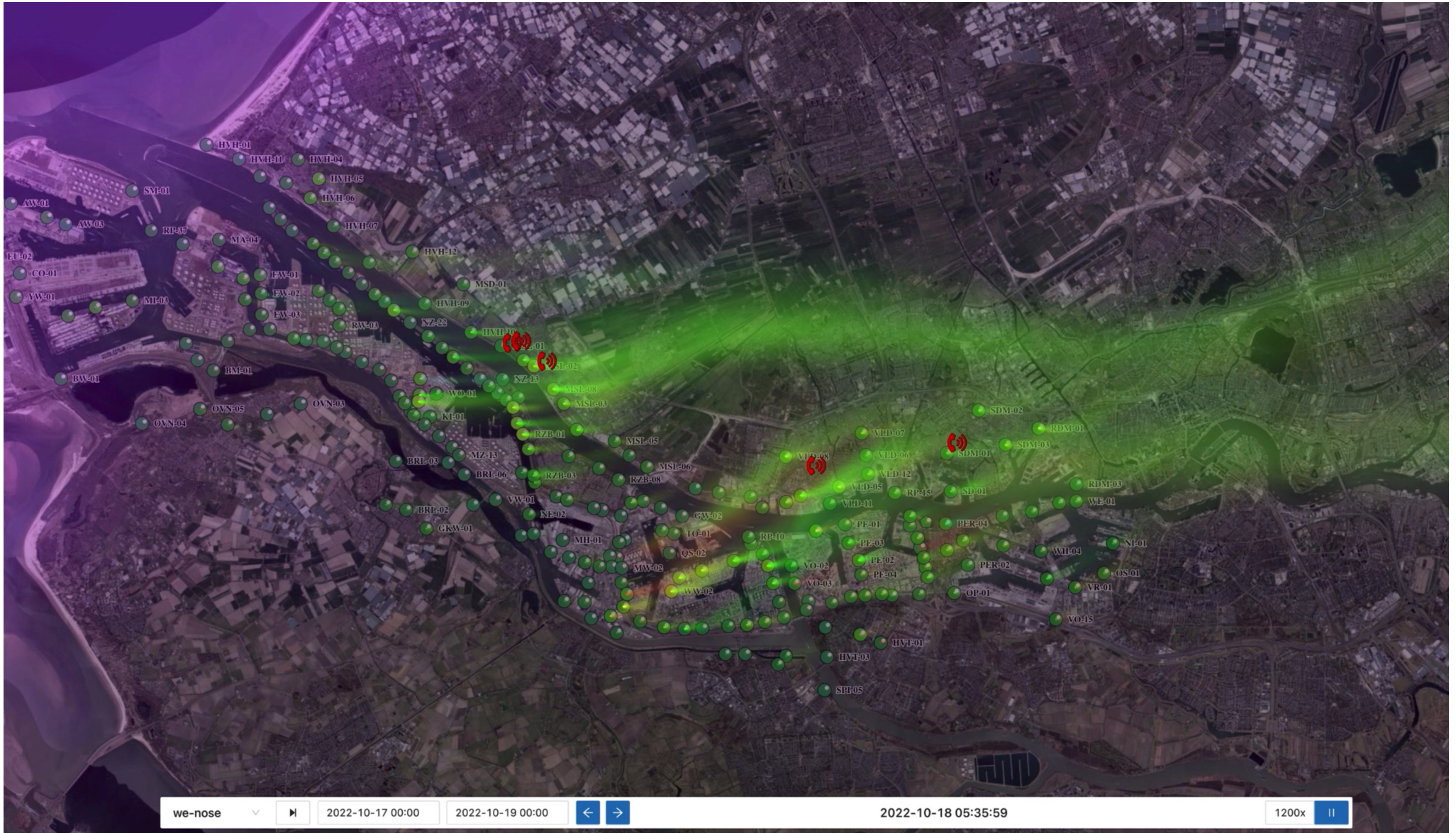


Case: Degassing vessel



Case

- Ethylene Oxide incident
- Ethyl Acrylate Incident
- Heat exchanger leak incident
- Butane Blending incident
- Sinking floating roof Toluene tank incident
- Jet-A1 spill
- NG Condensate incident
- Meth lab!



Thank you very much for your attention