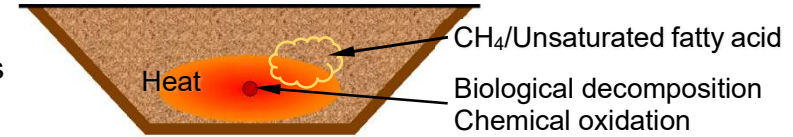


# IE-3 Detection of subsurface fire in waste pile: proposal of investigation flow and a case study in an inappropriate landfill site

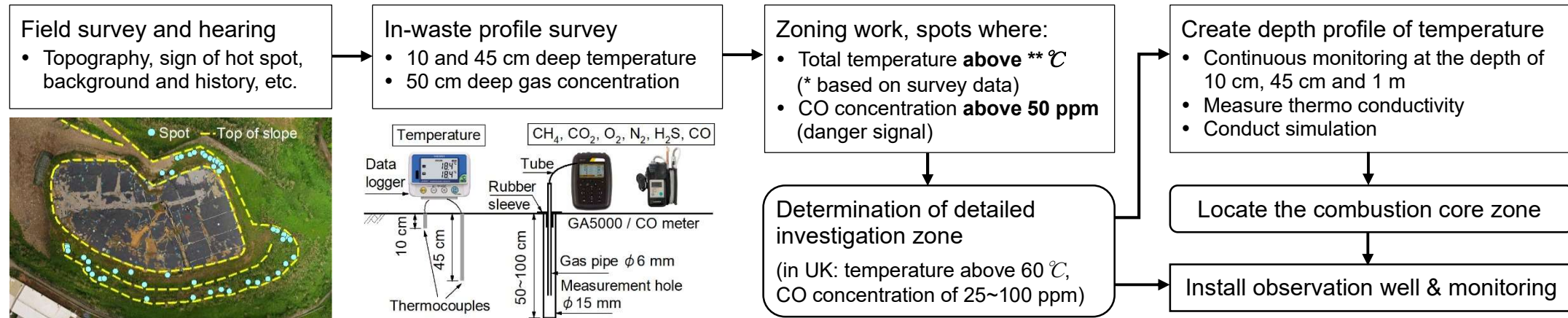
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## Background

- Risk of subsurface fire in waste piled up in illegal dumping site, inappropriate landfill site, etc.
- “Hot spot”: accumulation of heat, raising temperature, presence of combustible material or gas
- Preliminary investigation flow to determine the area of “hot spot” for detailed survey

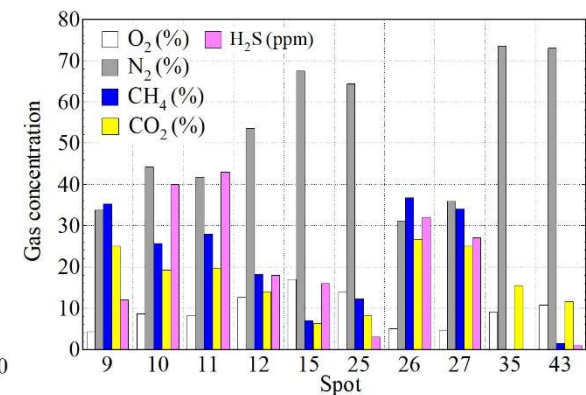
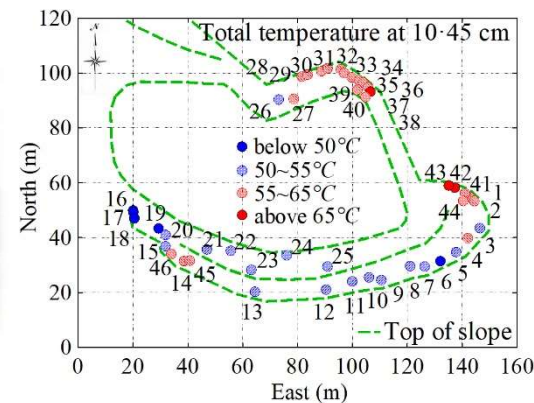
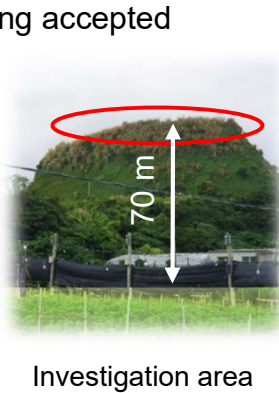


## Proposal of investigation flow



## Case study

- Inappropriate landfill site, industrial waste exceeding accepted capacity, piled up to 70 m
- Investigation area: top of the waste pile (46 spots)
- Atmospheric temperature: 20 °C ~ 27 °C
- 10 cm deep: 24 °C ~ 28 °C, **32.7 °C** (highest)
- 45 cm deep: 28 °C ~ 36 °C, **39.6 °C** (highest)
- 1 m deep (continuous monitoring): **45 °C ~ 50 °C**
- CO concentration: **< 2 ppm**
- No risk of subsurface fire



## Conclusion

- In-waste temperature distribution and gas concentration can be used to locate the hot spot for further detailed investigation on subsurface fire.
- In the case study, in-waste temperature at 1 m deep < 60 °C and CO concentration < 50 ppm, no risk of subsurface fire.