Trinity River Authority of Texas

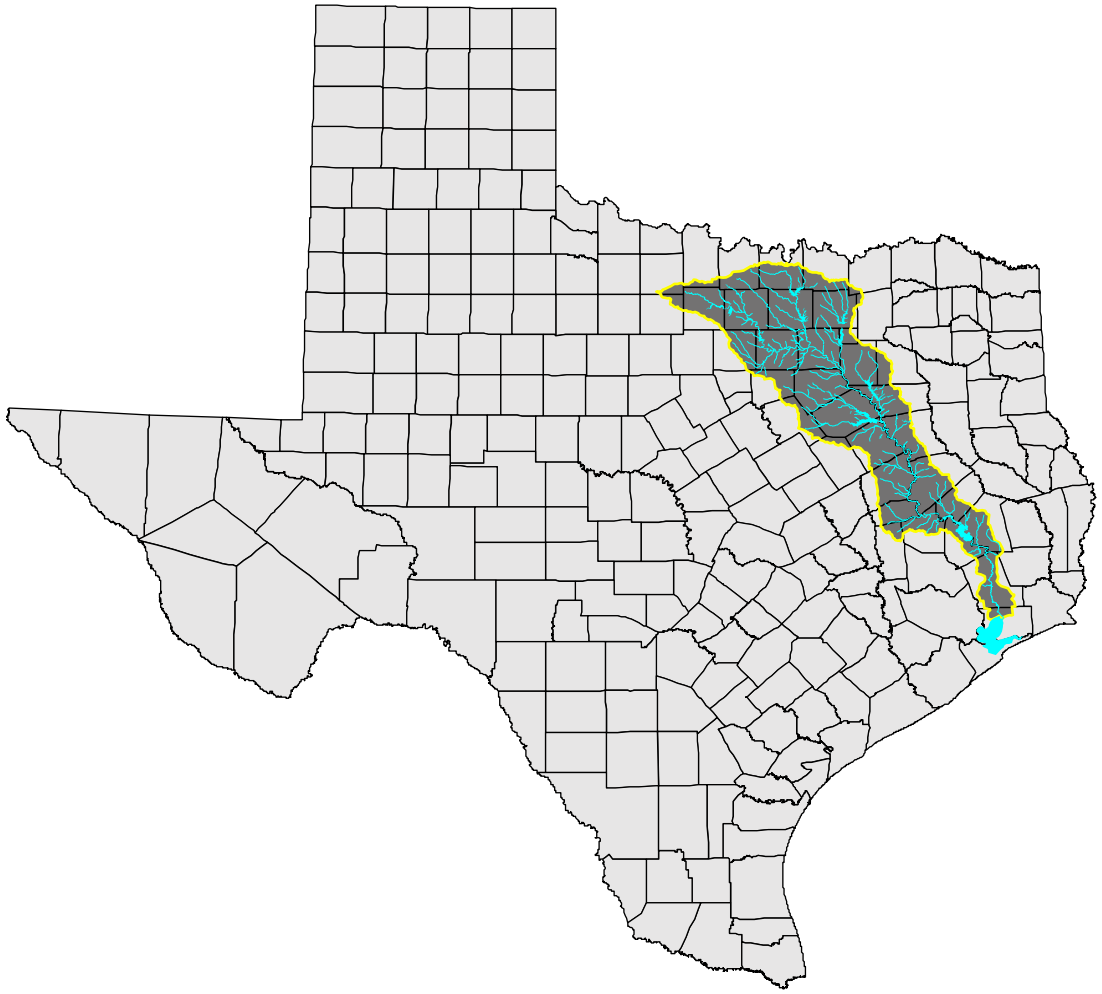
Enriching the Trinity basin as a resource for Texans

Chasing Ghosts: Modeling Odors at Municipal Wastewater Facilities

Wastewater Treatment ▪ Water Treatment ▪ Water Storage ▪ Lake Livingston ▪ Recreation

Steven Daniels - TRA
Richard Claro - Envirosuite

Trinity River Basin and TRA



Created by the Texas State Legislature in 1955.

Political subdivision of the State of Texas.

quasi-government, or

special purpose district.

Non-profit

no revenue from a direct tax

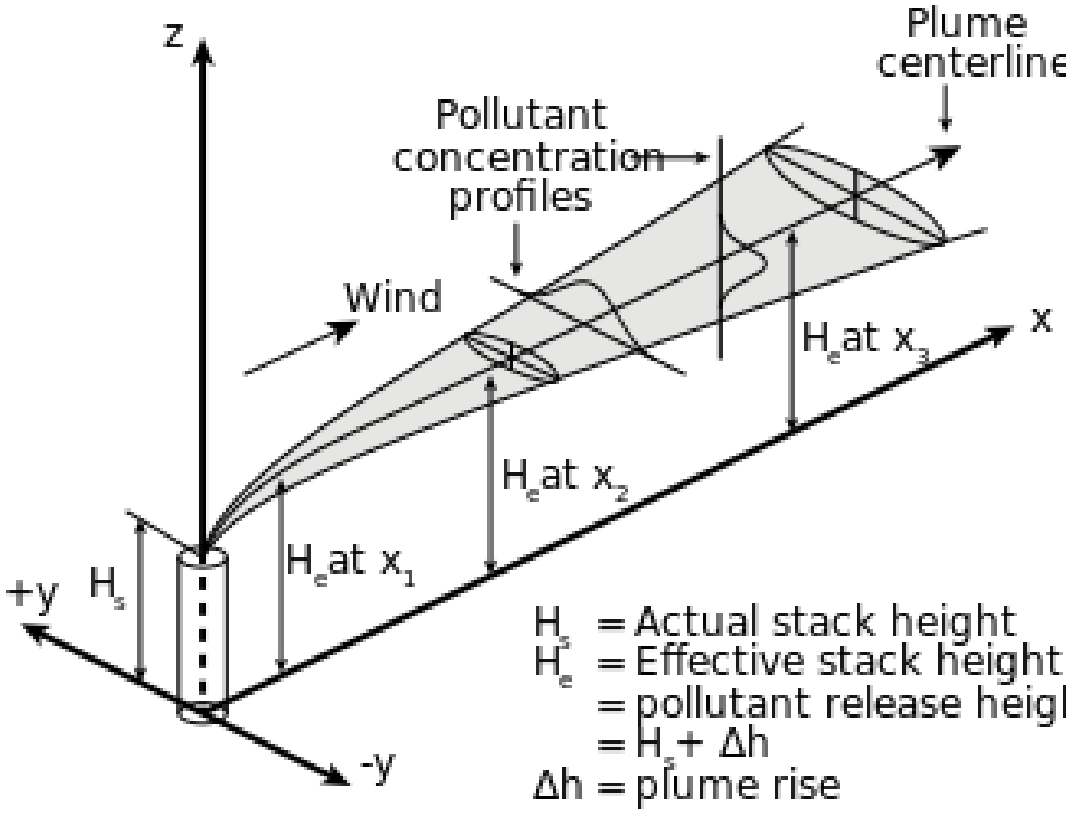
base, or

appropriations from the State or Federal Government.

Central Regional Wastewater Facility

- Service began 1959
- 189 Permitted treatment capacity
- Serves all or portions of 20 cities in the DFW Metroplex and DFW Airport

Odor Dispersion Modeling



- Illustrates how odors generated by wastewater conveyance and treatment are transported offsite
- Predicts the intensity, frequency, and spatial extent of nuisance odors
- Effective tool in public relations presentations

Odor Unit Perception

Odor Unit	Olfactory Perception
1 o.u.	50% of the population can start detecting an odor
3 o.u.	50% of the population can start qualifying an odor
5 o.u.	Odor is recognizable (can be identified)
Approx. 20 - 50 o.u.	Someone’s perfume
Approx. 250 o.u.	Freshly cut grass
Approx. 500 o.u.	Old household garbage that needs to be taken outside

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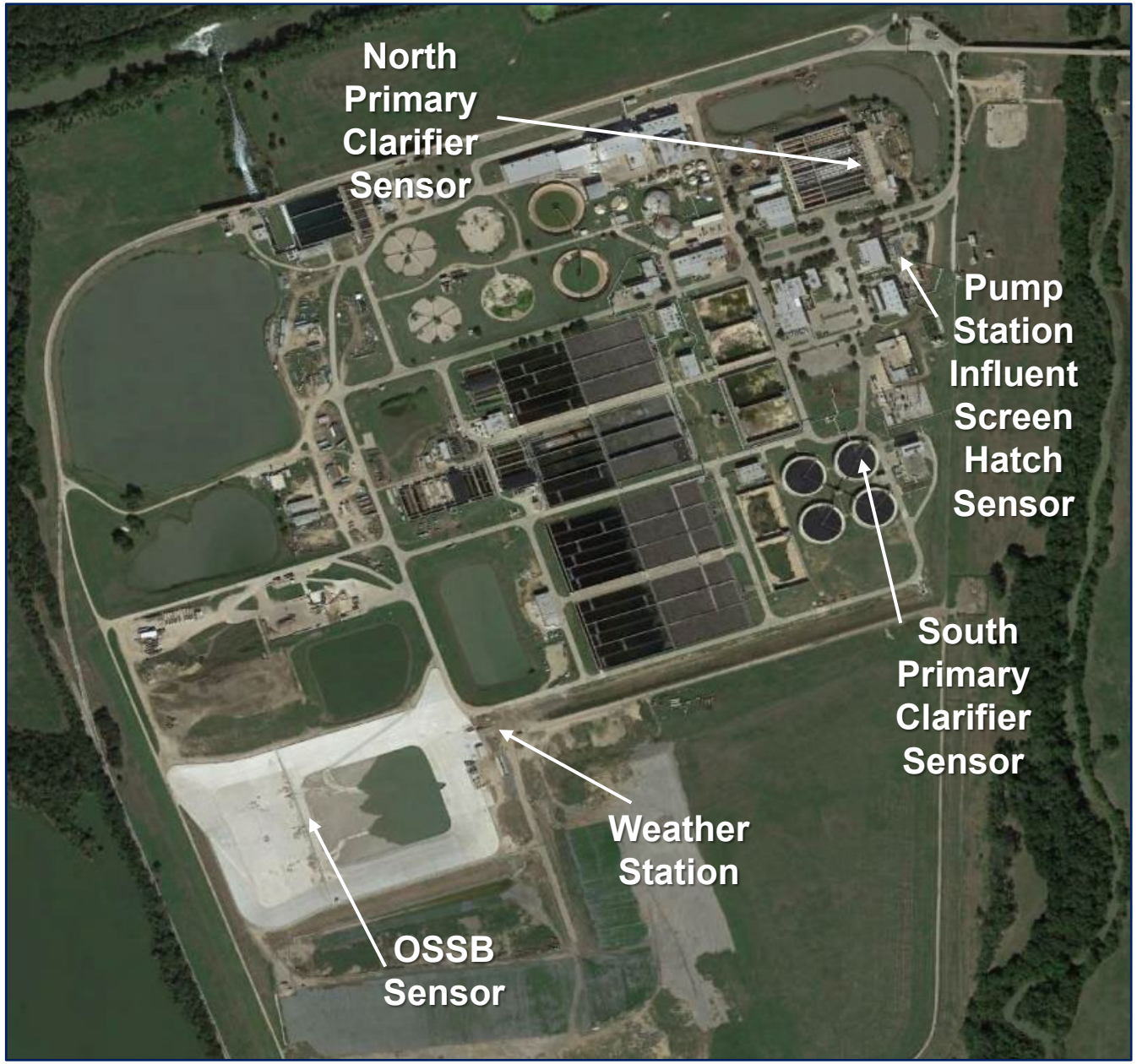
Odor Sensor and Weather Station Locations



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eNose®

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Weather Station

Model Limitations

- Accuracy of the model results should not be considered absolute - only as accurate as sum of measurements and assumptions
- Fixed source assumptions could either overestimate or underestimate – variability not accounted for with grab o.u. samples
- Ability of levee to keep odors within boundary may be underestimated
- eNoses may not pick up on odors not calibrated to detect

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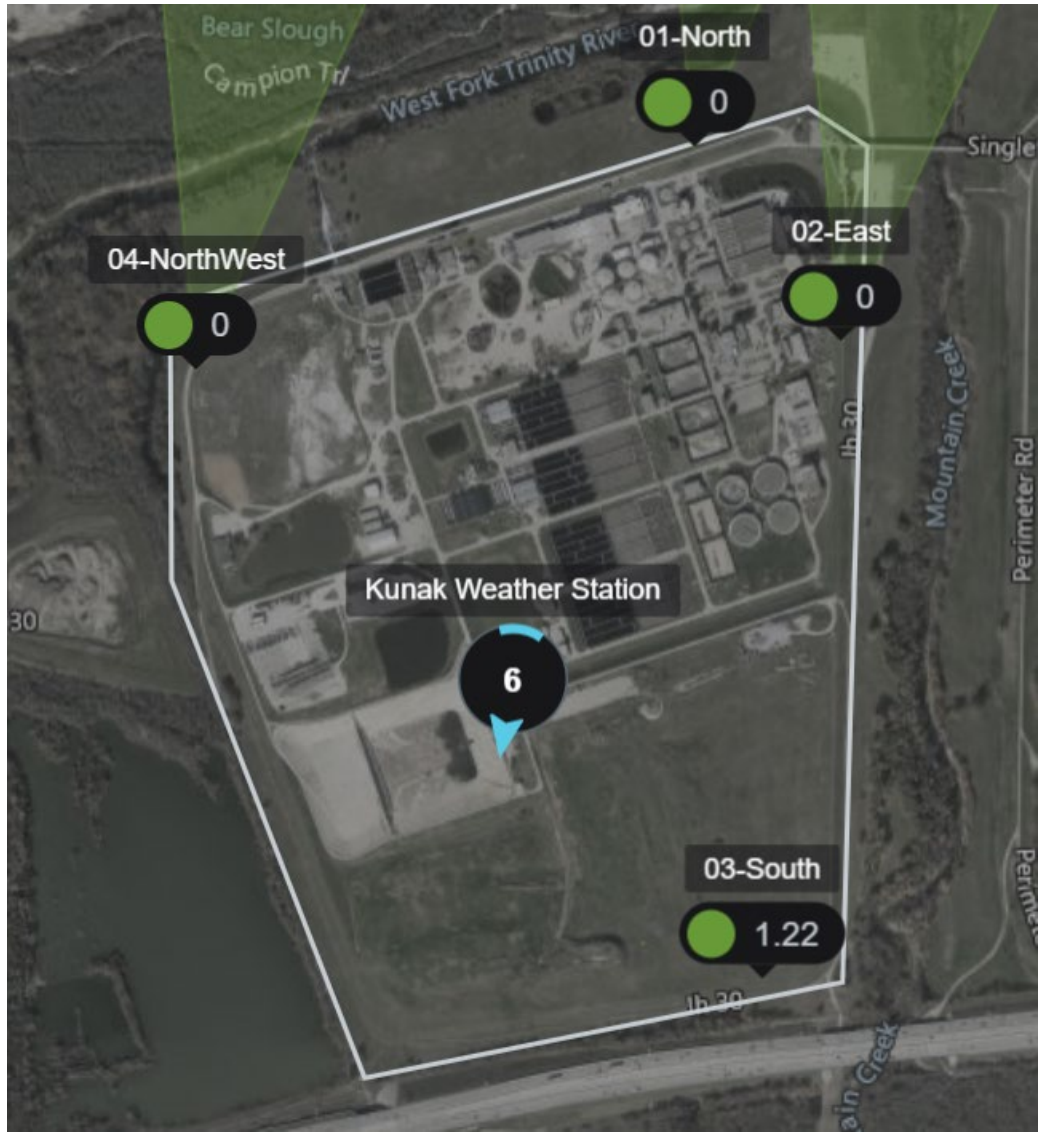
Kunak Perimeter Monitoring



Omnis Tools Utilized

Uses & Benefits

- When reports of odors are received, the system provides objective verification
- Possible first indication of issues inside the plant, such as failure of automated hatches at influent screens
- Provides useful information for planning of future odor control capital improvements
- Provides advance notification to management for potential odor events
- Provides information to support supplemental chemical feed or other short-term mitigation measures
- Provides objective “defense” when sources other than the WWTP may be the cause of off-site odor events

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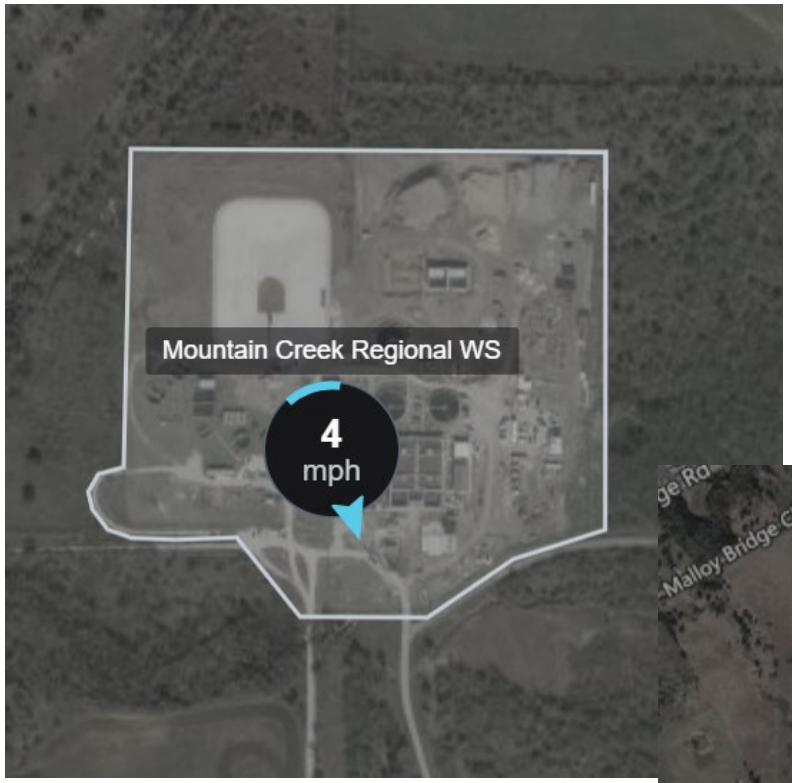
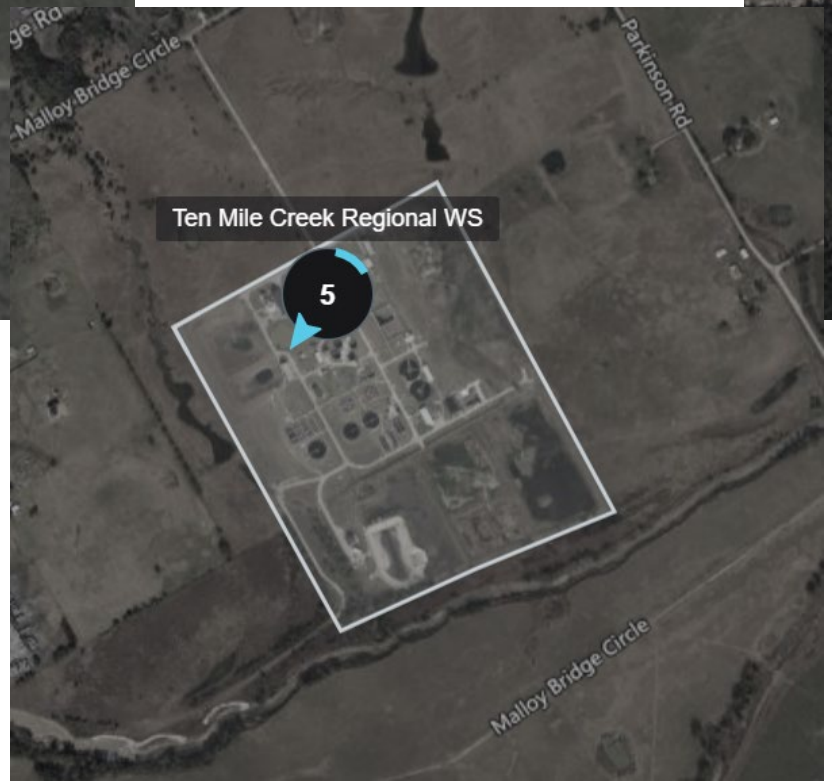
Denton Creek Regional Wastewater System

- Service began:1990
- Treatment Capacity: 11.5 MGD
- Serves 13 customer cities

Other Plants



MCRWS
4.5 MGD
4 Cities



TMCRWS
24 MGD
6 Cities

ROCRWS
6.0 MGD
6 Cities

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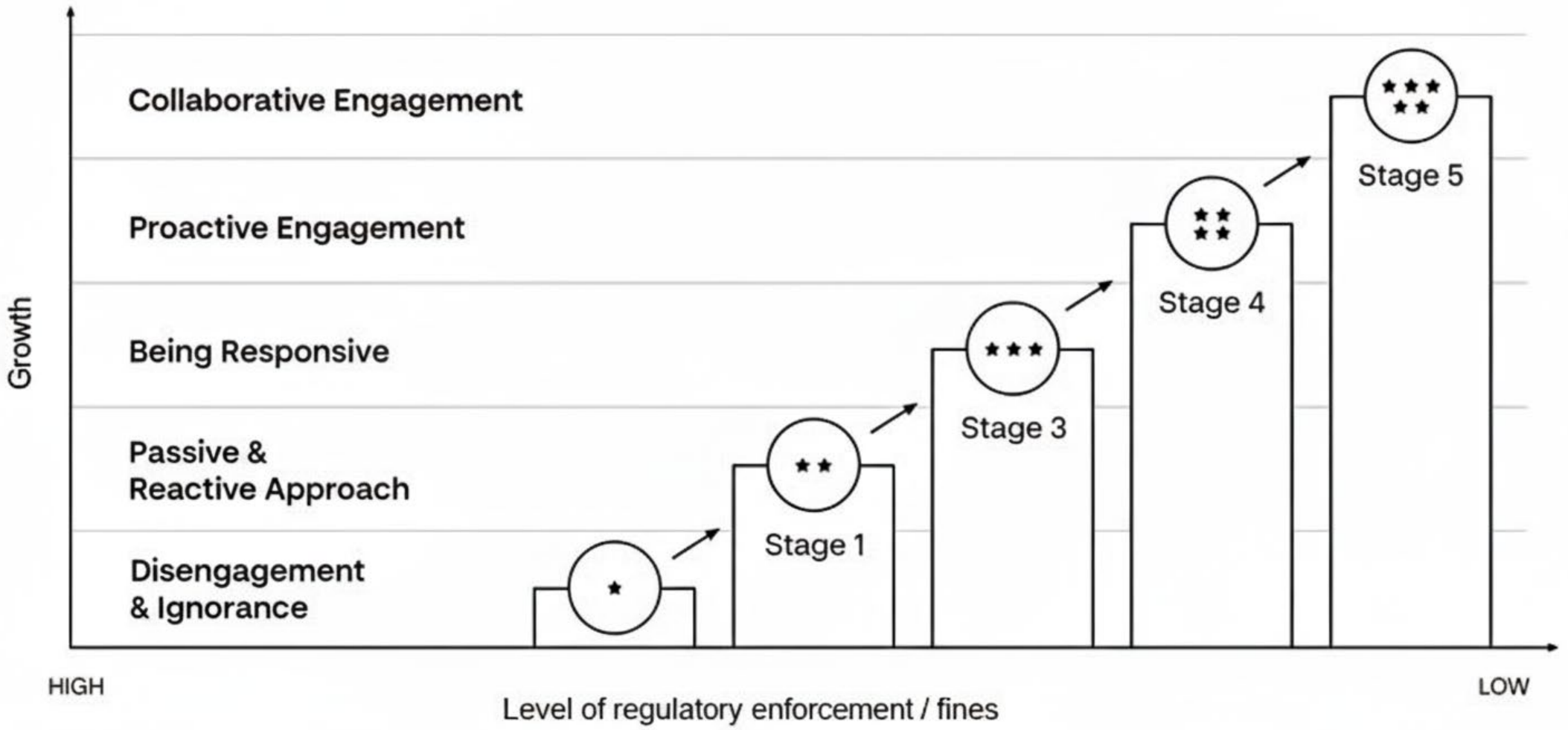
Today, **transparent community engagement** is mission critical to keep operating



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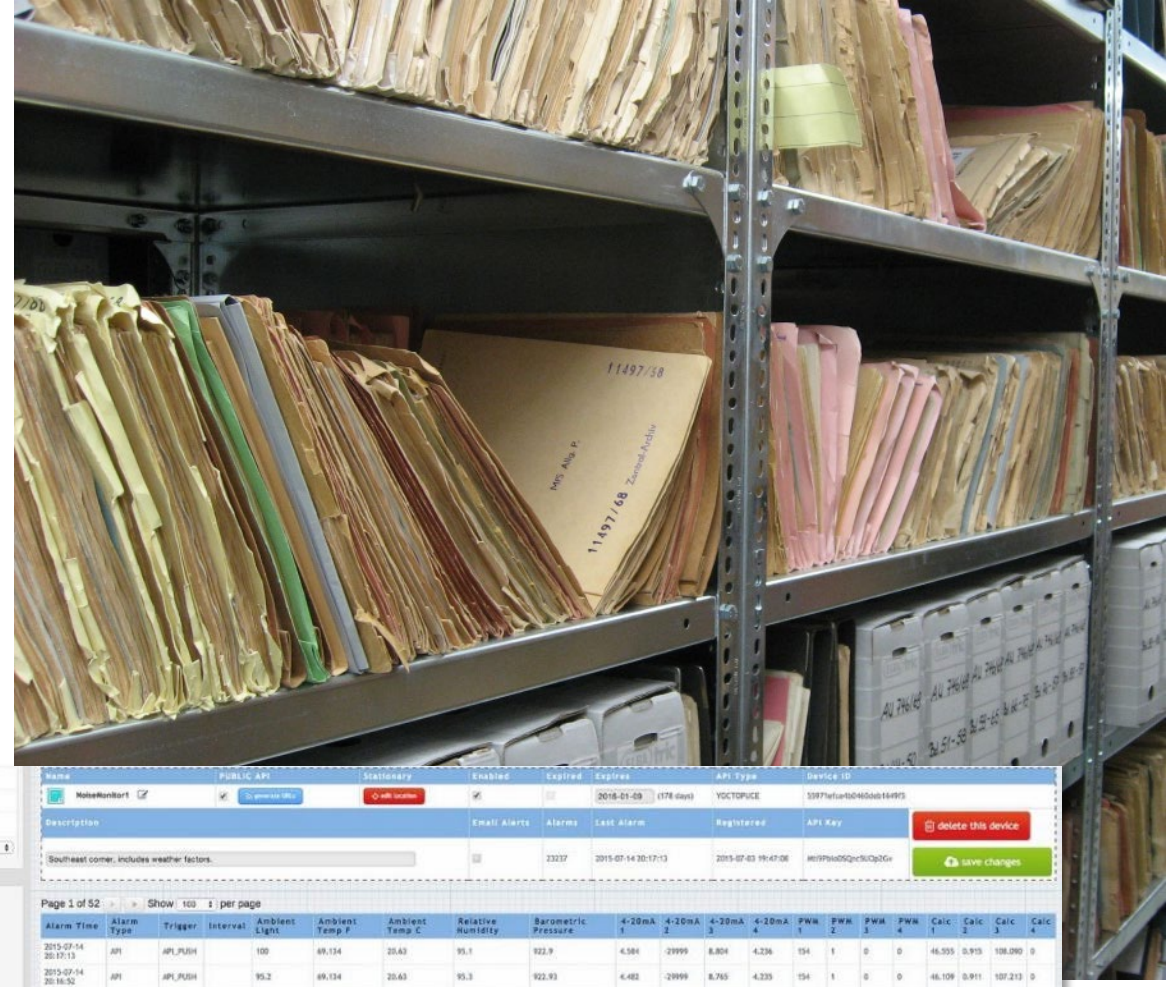
Traditional Environmental Monitoring

- Focused on collection, storage and display of information
- Systems are backward looking - historical analysis is slow and used primarily for compliance reporting
- Large amounts of data not being used
- Data silos created



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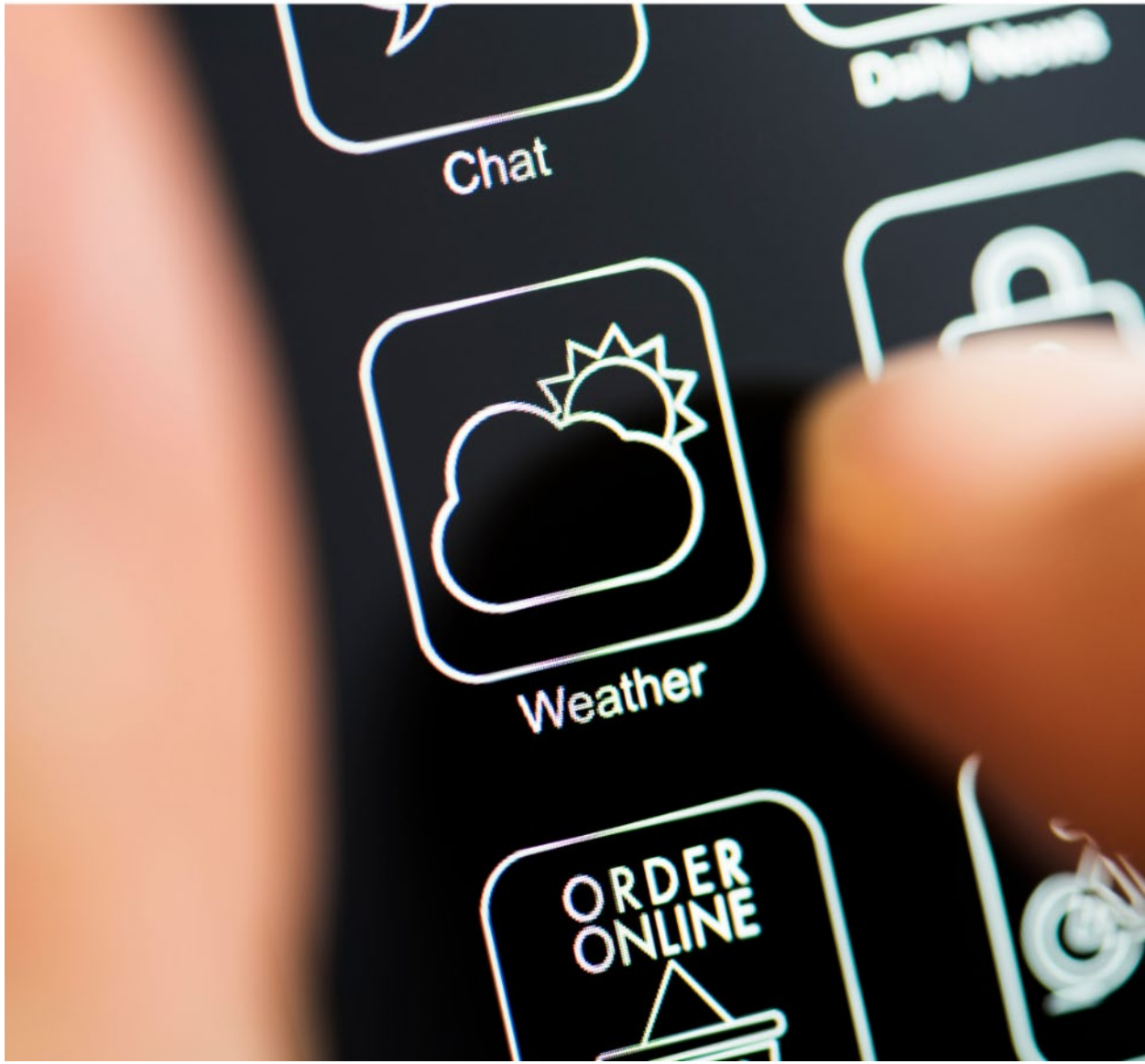
How can wastewater operators plan for odor impact today?

- Deploying odor monitoring networks
- Making operational decisions with local weather data
- Running scenarios with emission modelling software



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Introducing the Ideagen Envirosuite platform

Odour & Air Quality

Water

Noise

Vibration

Meteorological science

Dispersion modelling

Metriqa Hyperlocal Forecast

Emissions Intelligence

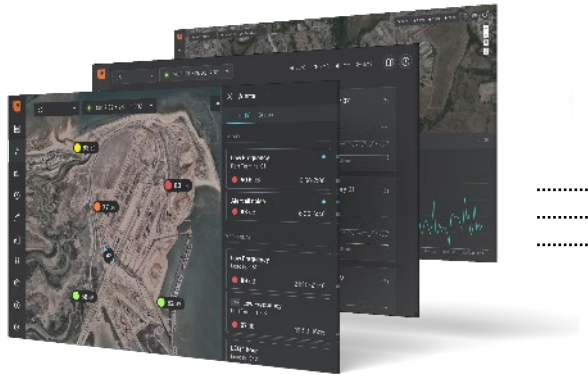
Ideagen Envirosuite

High-risk operating times

Operational activity patterns

Emissions mitigation strategies

Operational Data



MODERN, WEB-BASED, USER-FRIENDLY PLATFORM

Site-tailored guidance to operate at capacity within compliance

Predictive scenario modelling to identify efficiency gains

Continuous monitoring and smart alerts to minimise downtime

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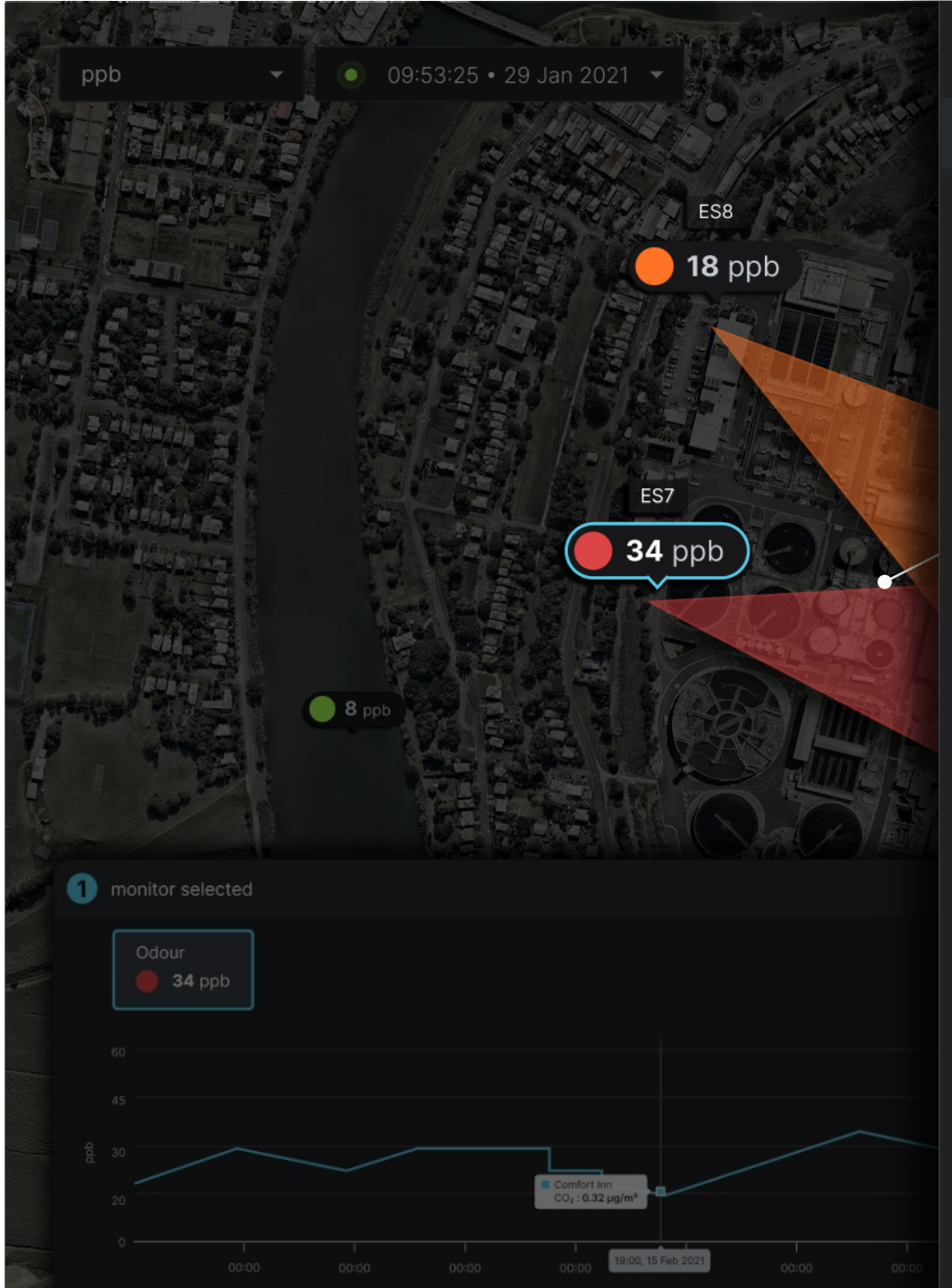
Know when you are at risk and understand sources in real-time

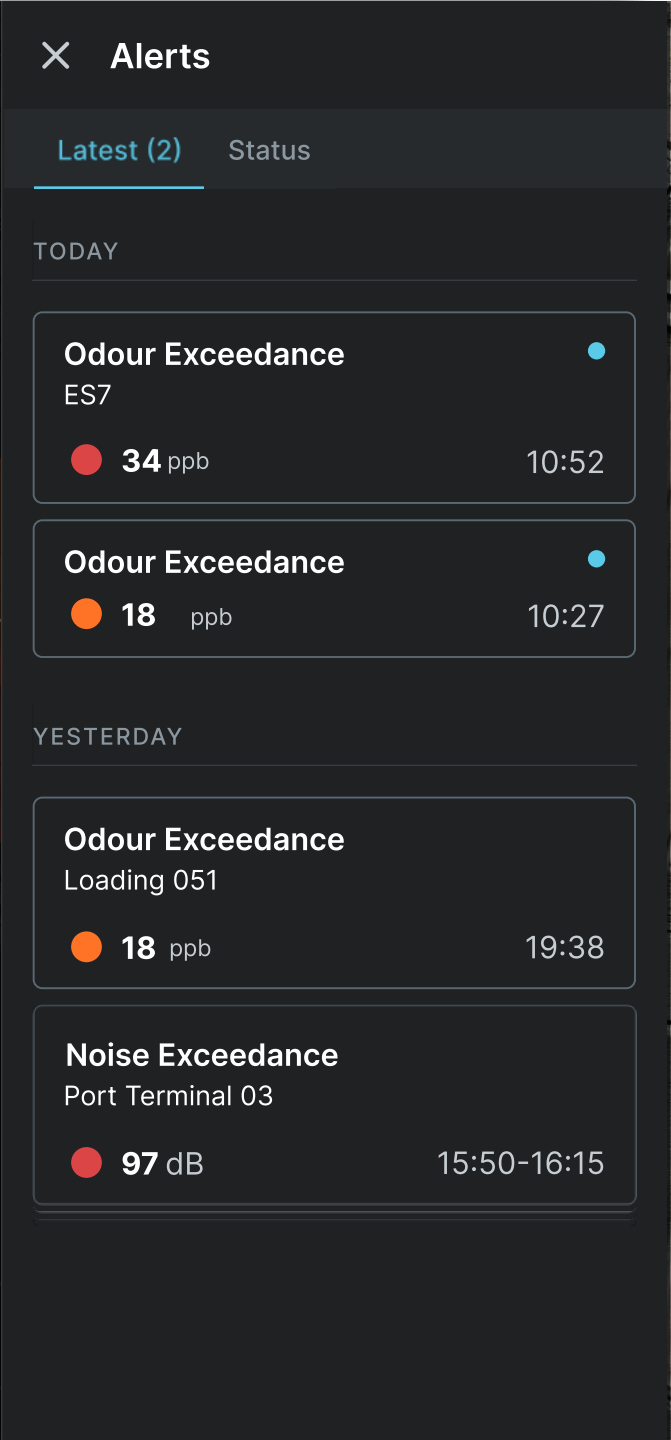
Anyone can quickly understand:

- Is there a problem?
- Where is it coming from?

So they can

- Respond rapidly
- Prevent incidents





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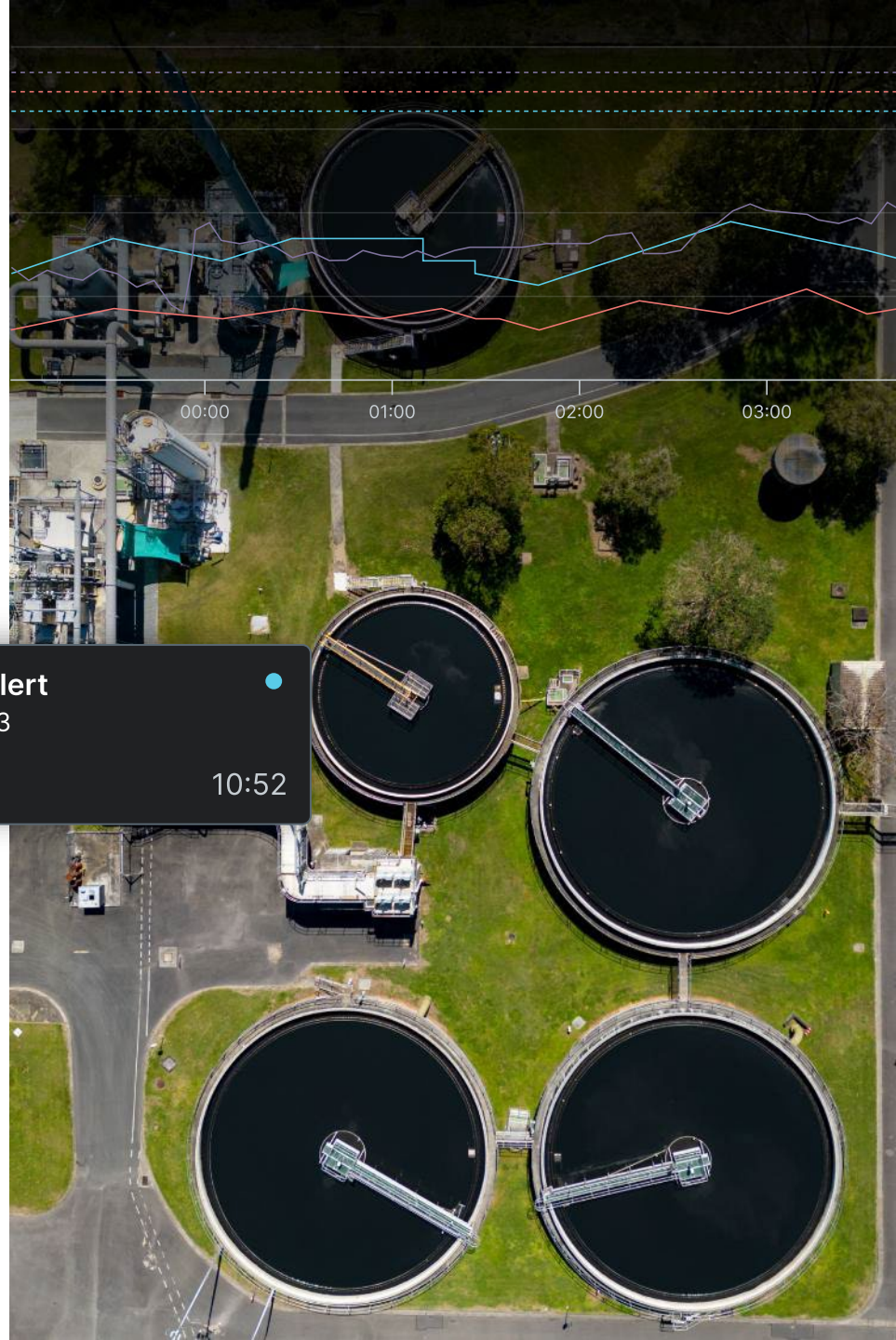
Real-time operational intelligence and alerts for precise odor control

Multiple-parameters
(Weather, Odor)

Colour-coded guidance
on what you can, and can't do

Identify
non compliance events

Custom rules
to suit licence conditions



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Traditional Complaints Management

- Complaint received
- Information recorded
- Crew sent
- Crude assessment
- **Inconclusive assessment**

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Rapid and effective response

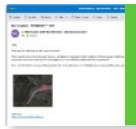
Complaint received

Ticket generated

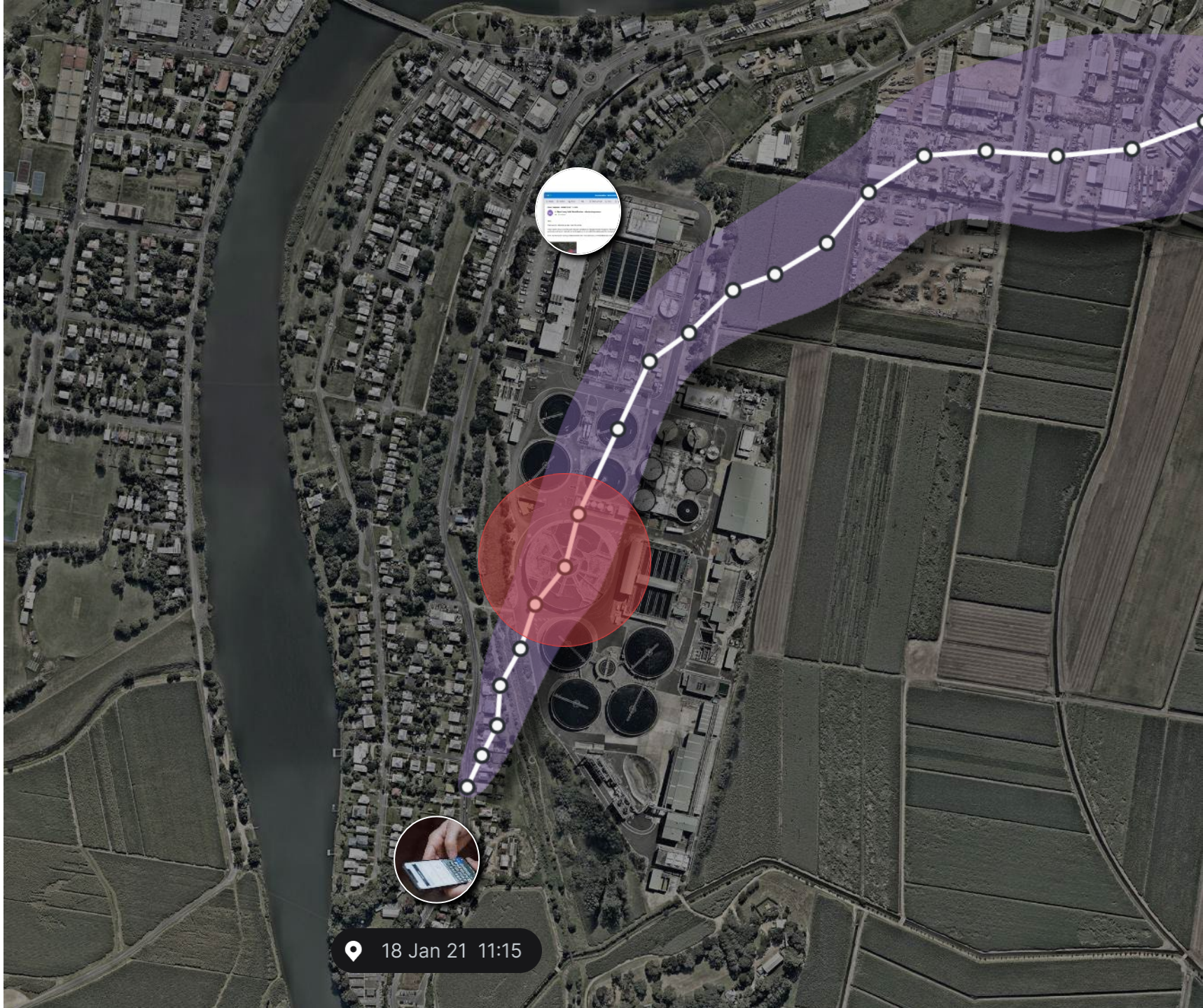
Reverse trajectory

Likely source identified

Deploy crew? ✕



Informed response



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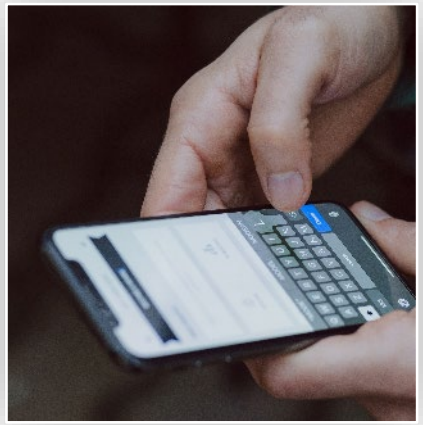
Rapid analysis and response to odor complaints

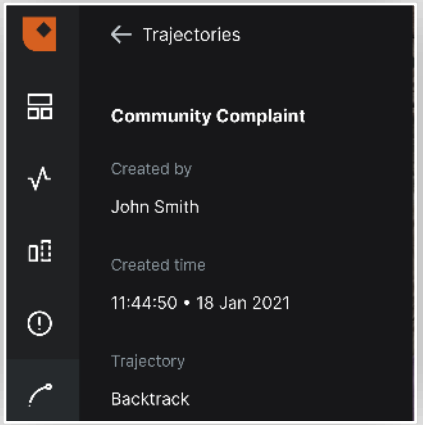
COMMUNITY COMPLAINTS PORTAL

BUSINESS PORTAL FOR ADVANCE COMPLIANTS MANAGEMENT



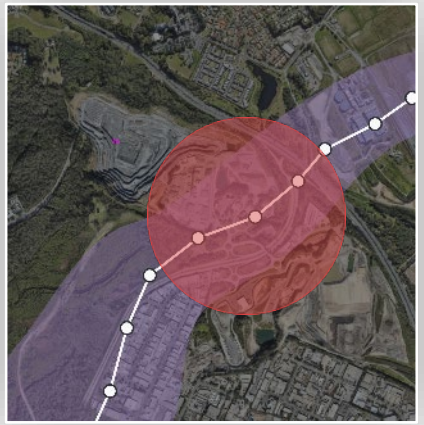
Complaint submitted

Communities can lodge complaints and observations through an automated process.



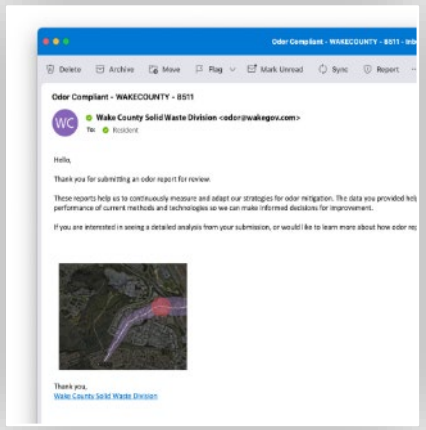
Ticket generated

Complaint ticket is automatically generated with all relevant information which can be shared and assigned to appropriate staff.



Likely source identified

Reverse trajectory of pollutant is automatically generated from the complaint source to determine whether further investigation is necessary.



Informed response sent

All evidence is collected and used to reach a prompt and efficient resolution. All recorded information can be analysed over time to optimise future operations.

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More confidence identifying problematic areas

- Understand the biggest sources of odor
- Reduce cost of mitigation resources
- Continuously validate and improve odor management plans
- Bridge operations and environment teams

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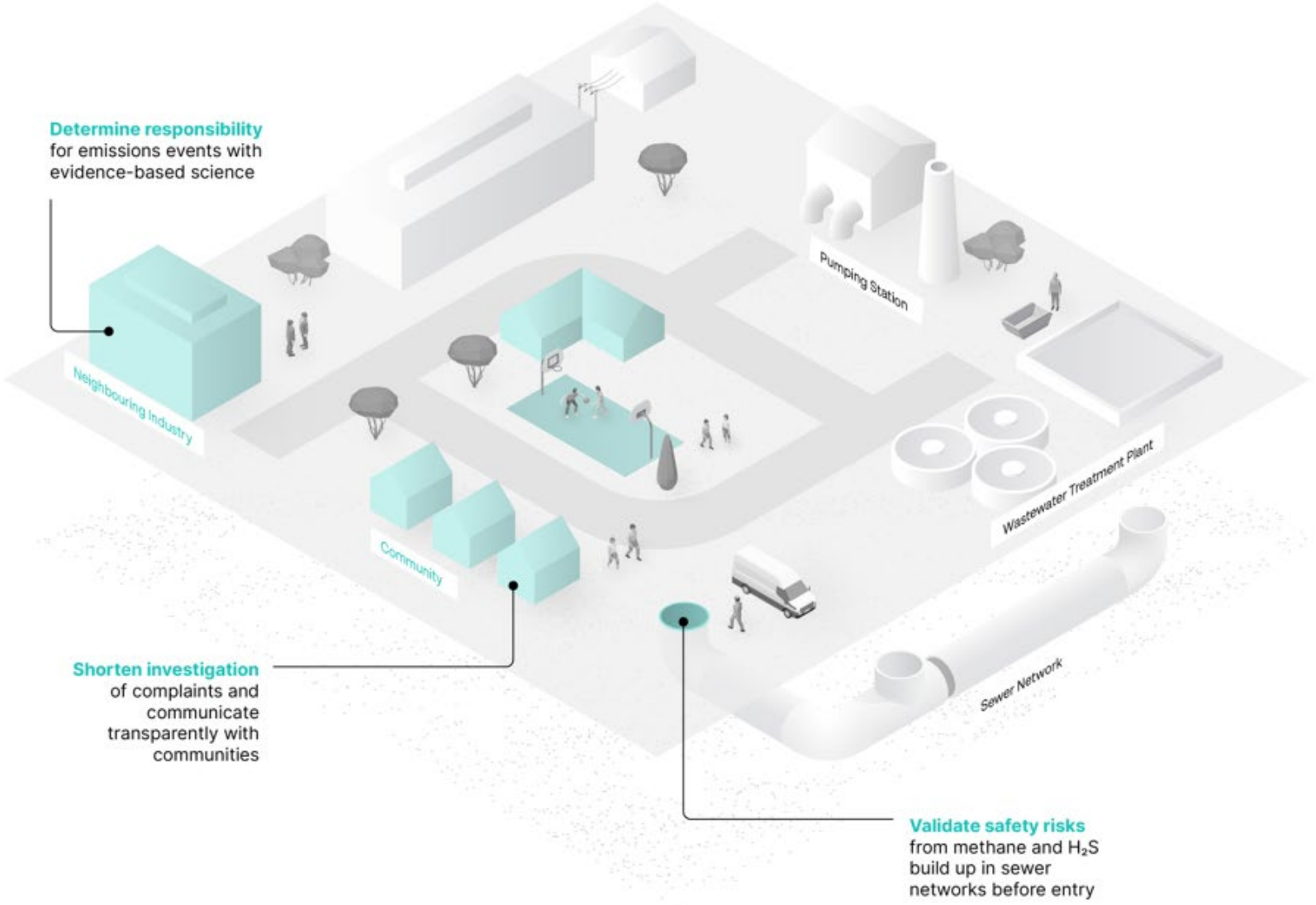
Future-proof operations and navigate urbanization



Questions?

Thank you!!

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