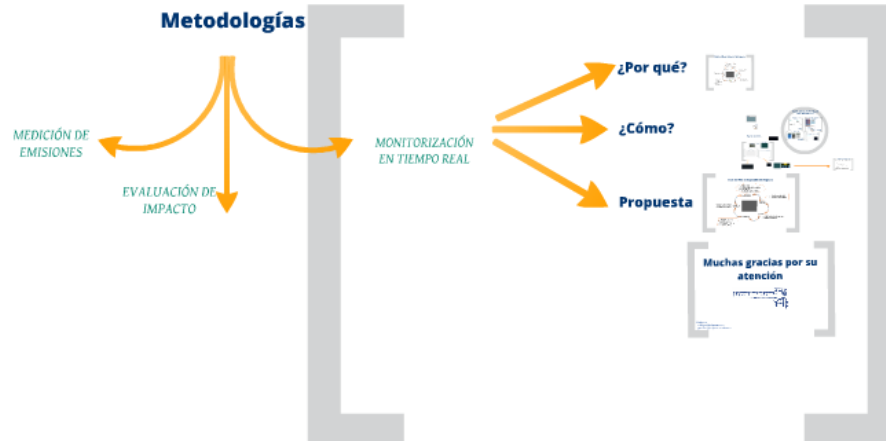




- ### Consideraciones preliminares
- **ENTENDER** la problemática asociada al sector que aplica en relación al potencial impacto de los diferentes compartimentos medioambientales (agua, aire) y/o procesos asociados al sector/industria de interés.
  - **VISUALIZAR** de forma global e individual los procesos clave de la industria de objeto de estudio.
  - **REVISAR** los elementos clave que ofrece la plataforma en relación a la gestión predictiva de riesgos ambientales, así como el beneficio económico y ambiental.

- ### EnviroSuite: presentación general
- Producto diseñado desde su base para conseguir **objetivos operacionales**.
  - Sistema centrado en **gestión predictiva y respuesta rápida**.
  - Ciencia puntera aplicada a un producto que puede utilizar **cualquier persona de la organización**.



# Plataformas digitales para la gestión predictiva de riesgos ambientales

*Santiago de Chile, 6 de Abril 2017*

Análisis olfatométrico  
EN13725



Toma de  
muestras



**EnviroSuite**  
A Pacific Environment Technology Product

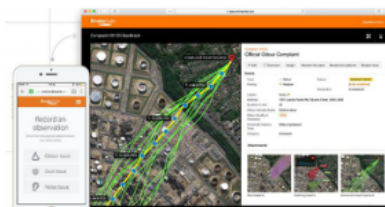
Monitoreo, modelización,  
gestión de quejas



Estación  
meteorológica



Sensores  $\text{NH}_3$ ,  $\text{H}_2\text{S}$

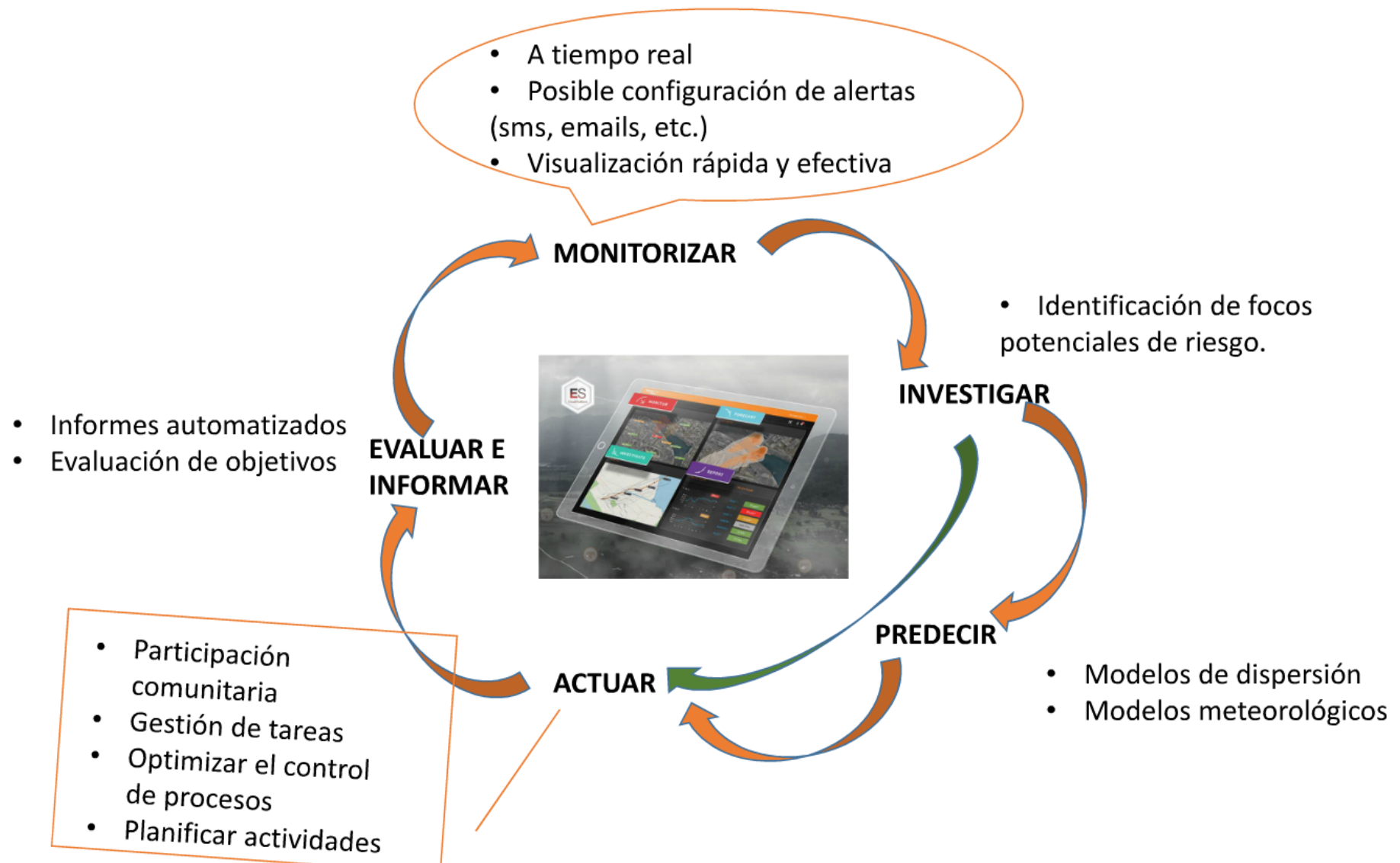


Análisis de trayectoria

# Visualización ciclo de vida del impacto ambiental, gestión a tiempo real



# Visualización ciclo de vida del impacto ambiental, gestión a tiempo real





## Consideraciones preliminares

- **ENTENDER** la problemática asociada al sector que aplica en relación al potencial impacto de los diferentes compartimentos medioambientales (agua, aire) y/o procesos asociados al sector/industria de interés.
- **VISUALIZAR** de forma global e individual los procesos clave de la industria de objeto de estudio.
- **REVISAR** los elementos clave que ofrece la plataforma en relación a la gestión predictiva de riesgos ambientales, así como el beneficio económico y ambiental.

# Metodologías

MEDICIÓN DE  
EMISIONES

MONITORIZACIÓN  
EN TIEMPO REAL

EVALUACIÓN DE  
IMPACTO

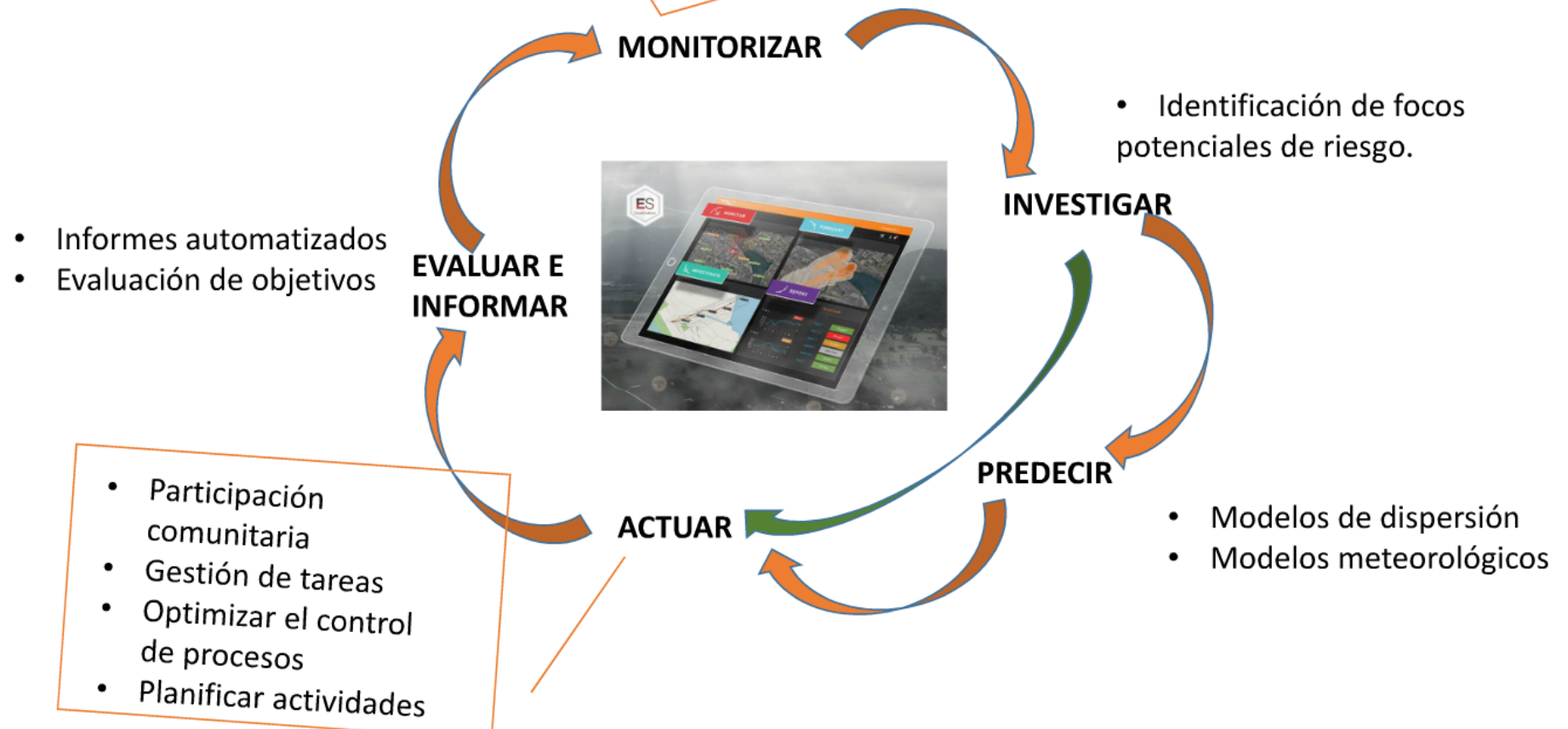


# *MONITORIZACIÓN EN TIEMPO REAL*



**¿Por qué?**

- A tiempo real
- Posible configuración de alertas (sms, emails, etc.)
- Visualización rápida y efectiva



**¿Cómo?**

# ¿Qué es?

*Sistema de gestión ambiental predictivo*



# ¿Cómo funciona?



**Recopila:** datos desde cualquier fuente de medición o dispositivo (satélites, estaciones meteorológicas, sensores que monitorean aire, agua, ruido o datos ya existentes).

**Convierte:** datos brutos en información de valor mediante algoritmos en continuo desarrollo.

**Acceso a la información:** histórica, actual y predictiva, a tiempo real y desde cualquier lugar.



# Opción sensores monitorización COVs, NH3, H2S: ppm

**H2S: 0-50 ppm; NH3: 0-100 ppm  
@ 1 ppm**

**MEMBRAPOR** AUTOCLEANING GAS SENSORS

**SPECIFICATION SHEET for AMBERAL SENSORS with FAST RESPONSE TIME SENSOR-10**

**Technical Information:**

| Parameter             | Value                 |
|-----------------------|-----------------------|
| Operating Temperature | -20°C to +50°C        |
| Storage Temperature   | -40°C to +70°C        |
| Humidity              | 10% to 90% RH         |
| Pressure              | 1 bar                 |
| Response Time         | 10s                   |
| Recovery Time         | 10s                   |
| Accuracy              | ±1% (1 ppm)           |
| Resolution            | 0.1 ppm               |
| Output                | 4-20mA, RS485, RS232C |
| Power Supply          | 12VDC                 |
| Power Consumption     | 100mA                 |
| Dimensions            | 40x40x100mm           |
| Weight                | 100g                  |

**Coste:**  
**1.500€/sensor**

**H2S: 0-2 ppm; NH3: 0-50 ppm  
@ 0,1-0,3 ppm**

**Condenser, Available H2S Monitoring in Wet Gas/Wetness**

**QMS Monitor de Amino Sulfuro**

**Features:**

- Highly accurate and reliable
- Wide range of gas concentrations
- Highly accurate and reliable
- Wide range of gas concentrations
- Highly accurate and reliable
- Wide range of gas concentrations

**Coste:**  
**3.000 €/sensor**

**H2S: 0-90 ppb; @ 1 ppb**

**QMS Monitor de Amino Sulfuro**

**Features:**

- Highly accurate and reliable
- Wide range of gas concentrations
- Highly accurate and reliable
- Wide range of gas concentrations
- Highly accurate and reliable
- Wide range of gas concentrations

**Coste:**  
**12.500€/sensor**

**H2S: 0-1000 ppb; @ 20 ppb; @ 200ppm**

**QMS Monitor de Amino Sulfuro**

**Features:**

- Highly accurate and reliable
- Wide range of gas concentrations
- Highly accurate and reliable
- Wide range of gas concentrations
- Highly accurate and reliable
- Wide range of gas concentrations

# H<sub>2</sub>S: 0-50 ppm; NH<sub>3</sub>: 0-100 ppm @ 1 ppm

## MEMBRAPOR ELECTROCHEMICAL GAS SENSORS

### SPECIFICATION SHEET for AMMONIA SENSOR with FAST RESPONSE TYPE NH<sub>3</sub>/MR-100

#### PERFORMANCE CHARACTERISTICS

|                                       |                                  |
|---------------------------------------|----------------------------------|
| Nominal Range                         | 0 – 100 ppm                      |
| Maximum Overload                      | 200 ppm                          |
| Expected Operation Life               | 2 years in air                   |
| Output Signal                         | 110 ± 30 nA/ppm                  |
| Resolution                            | 1 ppm                            |
| Temperature Range                     | -10 °C to 40 °C                  |
| Pressure Range                        | Atmospheric <sup>1)</sup>        |
| Pressure Coefficient                  | No data                          |
| T <sub>90</sub> Response Time         | < 40 sec                         |
| Relative Humidity Range               | 15 % to 90 % R.H. non-condensing |
| Baseline                              | 0 ppm ± 3 ppm                    |
| Maximum Zero Shift (+20 °C to +40 °C) | -8 ppm                           |
| Typical Long Term Output Drift        | < 5% per 6 months                |
| Recommended Load Resistor             | 10 Ohm                           |
| Bias Voltage                          | Not allowed                      |
| Repeatability                         | < 3 % of signal                  |
| Output Linearity                      | < 5 % full scale                 |
| Humidity Effect <sup>2)</sup>         | < 4 ppm                          |

<sup>1)</sup> no data for deviations

<sup>2)</sup> abrupt changes in rel. humidity causes a short term transient signal

#### CROSS-SENSITIVITY DATA

| Interfering Gas                | Concentration | Reading |
|--------------------------------|---------------|---------|
| CO                             | 300 ppm       | 0 ppm   |
| H <sub>2</sub>                 | 200 ppm       | 0 ppm   |
| SO <sub>2</sub> <sup>3)</sup>  | 20 ppm        | -7 ppm  |
| H <sub>2</sub> S <sup>3)</sup> | 20 ppm        | 7 ppm   |
| NO <sup>3)</sup>               | 20 ppm        | -1 ppm  |
| NO <sub>2</sub> <sup>3)</sup>  | 20 ppm        | -20 ppm |
| Cl <sub>2</sub>                | 20 ppm        | -55 ppm |
| CO <sub>2</sub>                | 2 %           | 0 ppm   |
| SiH <sub>4</sub>               | 10 ppm        | 0 ppm   |

<sup>3)</sup> Long term exposures and high concentrations may affect the performance characteristics

Performance data conditions:  
20 °C, 50% RH and 1013 mbar

The data contained in this document is for guidance only. Membrapor AG accepts no liability for any consequential losses, injury or damage resulting from the use of this document or the information contained within it. The data is given for guidance only. Customers should test under their own conditions, to ensure that the sensors are suitable for their own requirements.

REV.: 3/2007

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Page 1 of 1

MEMBRAPOR AG  
Birkenweg 2  
CH-8304 Wallisellen  
Switzerland

## MEMBRAPOR ELECTROCHEMICAL GAS SENSORS

### SPECIFICATION SHEET FOR HIGH SENSITIVE H<sub>2</sub>S SENSOR TYPE H<sub>2</sub>S/M-50

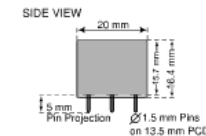
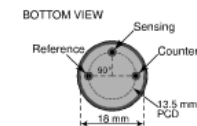
#### PERFORMANCE CHARACTERISTICS

|                                          |                                  |
|------------------------------------------|----------------------------------|
| Nominal Range                            | 0 – 50 ppm                       |
| Maximum Overload                         | Nd                               |
| Expected Operation Life                  | 2 years in air                   |
| Output Signal                            | 1'200 ± 250 nA/ppm               |
| Resolution                               | 0,05 ppm                         |
| Temperature Range                        | -40 °C to +50 °C                 |
| Pressure Range                           | Atmospheric ± 10 %               |
| Pressure Coefficient                     | No data                          |
| T <sub>90</sub> Response Time            | < 25 sec                         |
| Relative Humidity Range                  | 15 % to 90 % R.H. non-condensing |
| Typical Baseline Range (pure air, 20 °C) | -0,1 ppm to +0,1 ppm             |
| Maximum Zero Shift (+20 °C to +40 °C)    | 0,1 ppm equivalent               |
| Expected Long Term Output Drift          | < 2 % signal loss/month          |
| Recommended Load Resistor                | 10 Ohm                           |
| Bias Voltage                             | Not required                     |
| Repeatability                            | < 2 % of signal                  |
| Output Linearity                         | Linear                           |

#### PHYSICAL CHARACTERISTICS

|                                 |                                 |
|---------------------------------|---------------------------------|
| Weight                          | ~ 5.4 g                         |
| Position Sensitivity            | None                            |
| Storage Life                    | Six months in container         |
| Recommended Storage Temperature | 5 °C – 20 °C                    |
| Warranty Period                 | 12 months from date of dispatch |

#### Miniature-Size Outline Dimensions



#### CROSS-SENSITIVITY DATA

| Interfering Gas | Concentration | Reading   |
|-----------------|---------------|-----------|
| CO              | 200 ppm       | < 1.2 ppm |
| H <sub>2</sub>  | 200 ppm       | < 1.2 ppm |

Performance data conditions:  
20 °C, 50% RH and 1013 mbar

#### APPLICATIONS

Continuous Air Quality Monitoring  
For Portable Gas Detectors

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REV.: 2/2008

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www.membrapor.ch

Page 1 of 1

MEMBRAPOR AG  
Birkenweg 2  
CH-8304 Wallisellen  
Switzerland

**Coste:**  
**1.500€/sensor**

# H2S: 0-2 ppm; NH3: 0-50 ppm @ 0,1-0,3 ppm



Odor control in wastewater treatment plants and sewage collection systems often requires the use of scrubber systems. Many offshore scrubbers employ a wet process using hydrochloric acid to remove H<sub>2</sub>S from air streams prior to discharge. Monitoring the hydrochloric acid tank is both a hazard and a challenge. AAS has developed a sensor technology that now allows continuous monitoring in this type of application where condensing humidity conditions are normal.

Designated Model Q45S, the odor monitoring system uses our standard Q45 electronics package in conjunction with a special "Wet H<sub>2</sub>S" sensor. Measurements may be made either at the inlet to scrubber systems where concentrations can rise as high as 200 PPM, or at the outlet where concentrations are usually down below 0.5 PPM. Special sensor configurations are available for either duct insertion or flowline use.

Because Q45 systems use odorous monitoring gas streams with condensing levels of water vapor, provision has been made for eliminating water droplets from the sensor that could prevent a barrier to the diffusion of H<sub>2</sub>S into the sensor. An optional drainage system is available that transmitter will periodically deliver a pulse of air to the sensor and allow the sensor to remove water droplets. This system requires a clear gas diffusion path to the sensor and relative measurements on a continuous basis.

Q45 transmitters provide a large, easy-to-read LCD display of H<sub>2</sub>S concentration with a second display line to indicate other status information. An alarm contact is available for external alarming functions, and a second contact may be used for alarm purposes if the alarm system is not implemented in a plant application. Its relayed 4-20 mA output is provided for remote data transmission, and a standard RS-485 output is provided for integration of a data logger via RS-485 protocol.

A special battery-powered version of the Q45S is available for use in temporary installations. This system uses an internal lithium

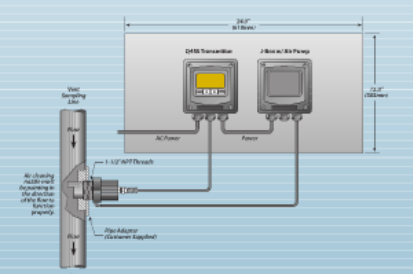


Q45S monitor and sensor

An optional air purge system, available by the transmitter with a special configuration of the sensor, the sensor will automatically purge the sensor of any water droplets or other contaminants.

battery and contains a data logger for collecting information on an existing installation system. A standard three-battery unit will operate for up to 14 days, while a unit with a three-battery unit will provide about 30 days of operation. Data is easily downloaded to a standard PC using software supplied with the unit.

## Installation



## Features

- Special Wet H<sub>2</sub>S Sensor:** System utilizes a special sensor designed to operate in condensing gas streams without the water vapor blinding typical of standard sulfide sensors.
- Automatic Sensor Air Purge:** An automatic system for purging accumulated droplet water from the face of the sensor allows long-term operation without loss of sulfide in condensed water on the sensor face.
- Two Internal Alarm Relays:** Q45S monitor contains relay that can be used for local alarm functions. One relay is used to control the air-purge system and the other is available for external alarms. Relays are programmable for setpoints, hysteresis, and delay functions.
- LCD Display:** Gas Concentration is displayed in large, easy-to-read numbers. The display also provides a second information line indicating raw sensor output, mA output, and other information. The display also allows easy programming using the 4 keys located on the front panel.
- Internal Data Logger:** Available in the battery-powered version, the data logger will store up to 10 days of data at 1 minute storage intervals.
- Output Simulation:** Transmitter analog output can be set to vary definable values and relay outputs can be set to specific values for complete simulation of detection system operation. Output and alarm may also be inhibited for maintenance and calibration.
- Weather-proof Nema 4X Enclosure:** Transmitters are designed for operation in typical wastewater treatment plant environments. The electronic assembly is CSA/UL certified.

## Specifications

|                       |                                                                                                              |
|-----------------------|--------------------------------------------------------------------------------------------------------------|
| Gas Type              | Hydrogen Sulfide                                                                                             |
| Sensor Type           | Special wet gas sensor design                                                                                |
| Range                 | 0-2000 PPM, 0-2000 PPM, 0-2000 PPM (gang configurable)                                                       |
| Response Time         | 90% in 60 seconds                                                                                            |
| Accuracy              | Generally $\pm 10\%$ of value, but limited by available calibration gas                                      |
| Sensitivity           | 0.1 PPM minimum                                                                                              |
| Zero Drift (typ)      | $\pm 0.05$ PPM                                                                                               |
| Electronic Linearity  | 99.9%                                                                                                        |
| Span Drift            | Dependent on operating environment but generally less than 2% per month                                      |
| Analog Output         | Isolated 4-20 mA, 5V3 wire maximum                                                                           |
| Power                 | 115 or 230 VAC, 50/60 Hz, 5 VA max                                                                           |
| Alarm Relays          | Two SPST, 5 A @ 230 VAC, isolated                                                                            |
| Relay Coil            | Independable either normally closed or normally open (selected)                                              |
| Drainage              | None (Wet H <sub>2</sub> S configuration), 500 gals, or panel-mounted 4-inlet drainage with flow of moisture |
| Operating Temperature | -20 to 150 °F                                                                                                |
| Operating Pressure    | 0.2 to 15 PSIG                                                                                               |
| Weight                | 4.5 lbs (1.6 kg)                                                                                             |

## Ordering Information:

### Model Q45S-A-B

### Wet Hydrogen Sulfide Monitor

### Model Q45S-A-B Wet Hydrogen Sulfide Monitor

### Wet H<sub>2</sub>S Sensor

### 1-20 VDC, 2-wire (single output only)

### 2-115 VAC with 2 Relay & Drainage

### 2-230 VAC with 2 Relay & Drainage

### 3-115 VDC Battery with RS-485 & 4-20 mA Output

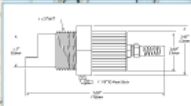
### 3-115 VDC Battery with Internal Data Logger & Software

### Q45S-A-B Air Purge System

### 1- No Air Purge

### 2- With Air Purge (not available with battery option)

## Dimensions



## Accessories

### 80-1031 - Air Inlet Adapter

### 80-1030 - Cal Inlet Adapter

## Q45S

## Monitor de Ácido Sulhídrico



## Descripción:

- Medición de ácido sulfhídrico – H<sub>2</sub>S
- Alojamiento en fibra de policarbonato con protección Nema 4X – IP66 para montaje en panel
- Pantalla retro iluminada dotada de 4 botones frontales de membrana
- Sensor especial para H<sub>2</sub>S acuoso (wet H<sub>2</sub>S) con rango de operación programable 0 – 2 ppm, 0 – 20 ppm ó 0 – 200 ppm
- Sensibilidad mínima 0,1 ppm
- Tiempo de respuesta 90% en 60 segundos
- Sistema de eliminación de condensado en la superficie del sensor mediante eyección de aire a presión
- 2 relés (dry contact) programable. Max. 5 A; Max. 230 VAC
- 2 salida 4-20 mA (500 ohmios) aisladas para registro
- Alimentación 100 – 240 VAC, 50/60 Hz.
- Dimensiones: 124 x 124 x 139 mm (monitor)
- Peso: 1.800 g

**Coste:**  
**3.000 €/sensor**



Represented by:

Analytical Technology, Inc.  
Attn: Bridge Sales  
California, PA 15402  
Phone: (412) 357-1000 / Toll Free: 800.955.4299  
Fax: (412) 357-1000  
E-Mail: sales@analyticaltechnology.com

Analytical Technology  
35 Stanford St.  
Methen, Arizona 85345-0001  
Phone: +1 (602) 447-8300  
Fax: +1 (602) 447-8300  
E-Mail: sales@atit.com

PSG-Q45S (11/04)

Web Site: www.analyticaltechnology.com

# H2S: 0-90 ppb; @ 1 ppb

**pm** A New Way  
Gas Detection and Electrical Services

## H<sub>2</sub>S Element

The Element series of gas monitors has been designed to detect parts per billion (ppb) of toxic gases. The first in the series is our H<sub>2</sub>S Element.



Odour Control Stacks  
Process Ductwork  
Boundaries

[0 - 90ppb] [0 - 500ppb] [0 - 1,500ppb]

**pm** A New Way  
Gas Detection and Electrical Services

## H<sub>2</sub>S Element

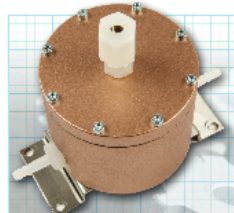


- Electrochemical cell sensor technology
- Accurate to  $\pm 1\%$  based on zero gas 10 tolerance
- Unique electronic noise interference elimination
- Continuous measurement every second
- EMC compliant to EN 61326-1 for immunity and emission
- Compliant to the Low Voltage Directive 2006/95/EC
- Designed for operation within vent sampling systems which use HSE approved vent engineering practices to enable monitoring of zone 1 and zone 2 gas streams

**pm** A New Way  
Gas Detection and Electrical Services

## H<sub>2</sub>S Element

Figure 1



The wheels of technology  
continue to turn...

- Used in conjunction with our specialist benzene sampling and conditioning systems the monitor provides accurate continuous readings of H<sub>2</sub>S with a 1 ppb resolution (0 - 90ppb range and a lower detectable level of 10 ppb)
- Automatic flow adjustment of internal pump maintaining optimum flow rate and eliminating operator adjustment
- Onboard digital outputs for Alarm 1, Alarm 2 and Fault, user selectable
- Analogous 4 - 20mA output
- 110 or 240V versions
- Flow failure digital output
- Unique swap out sensor enclosure (see figure 1)

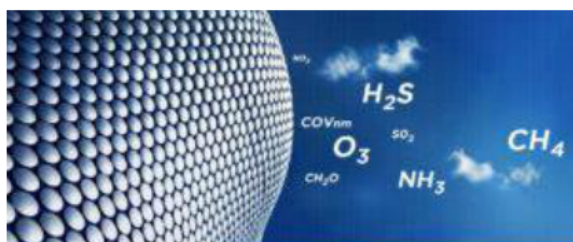
### TECHNICAL SPECIFICATION

|                    |                                                                                                                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power Supply       | 110 - 240V AC<br>50/60Hz<br>1.25A fused                                                                                                                                                                                        |
| Enclosures         | 300 x 300 x 120 mm (depth)<br>300 x 300 x 135 mm (with closed lid)                                                                                                                                                             |
| IP Rating          | IP68 rated enclosure has been modified to allow cable taking entry and display mounting. You should consider the enclosure no greater than IP68 and therefore enclose within a suitably rated cabinet to match site conditions |
| Weight             | 5.1 Kg                                                                                                                                                                                                                         |
| Display            | 2 x 16 digit, black on white backlit, Transflective LCD                                                                                                                                                                        |
| Outputs            | Analogic 4 - 20mA<br>Isolation Fail Safe Dry Contact<br>Alarm 1 Volt Free Contact<br>Alarm 2 Volt Free Contact                                                                                                                 |
| <b>SENSOR CELL</b> |                                                                                                                                                                                                                                |
| Temperature Range  | -30°C to 50°C                                                                                                                                                                                                                  |
| Pressure Range     | 80 to 120kPa                                                                                                                                                                                                                   |
| Humidity Range     | 15 to 95% RH                                                                                                                                                                                                                   |
| Storage/instal     | 6 months stored at 3 to 20°C (sealed in poly)                                                                                                                                                                                  |
| Load Resistor      | 33 to 100 Ohms (not required with pcb circuit supplied with Element)                                                                                                                                                           |
| Sensitivity        | $\pm 10\text{ppm}$ at 2 ppm H <sub>2</sub> S                                                                                                                                                                                   |
| Response Time      | 60 to 120 secs to 2 ppm H <sub>2</sub> S                                                                                                                                                                                       |
| Zero Current       | $\pm 0.1$ in zero air at 20°C                                                                                                                                                                                                  |
| Span               | $\pm 2$ standard deviation (ppb coefficient)                                                                                                                                                                                   |
| Range              | ppb H <sub>2</sub> S level of performance warranty                                                                                                                                                                             |
| Linearity          | ppb error at full scale linear at zero and 100ppb H <sub>2</sub> S                                                                                                                                                             |
| Drift (over time)  | maximum ppm for stable response to gas pulse                                                                                                                                                                                   |
| Zeroability        | ppb equivalent change/zero in full air                                                                                                                                                                                         |
| Sensitivity drift  | % change/zero in full air, monthly test results until 10% original signal (12 months warranty)                                                                                                                                 |
| Operating life     | > 30<br>> 24                                                                                                                                                                                                                   |
| Sensitivity        | @ 20°C: $\pm 1\%$ output @ 20°C output @ 20°C @ 2ppm H <sub>2</sub> S 77 to 90                                                                                                                                                 |
| Span               | @ 20°C: $\pm 1\%$ output @ 20°C output @ 20°C @ 2ppm H <sub>2</sub> S 100 to 110                                                                                                                                               |
| Zero               | @ 20°C: $\pm 1\%$ change from 20°C                                                                                                                                                                                             |

**Coste:**  
**12.500€/sensor**



# H2S: 0-1000 ppb; @ 20 ppb; @ 200ppm



Miniature air quality monitoring systems

## Solutions



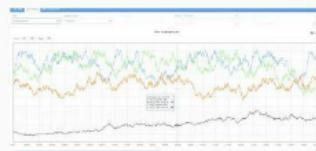
Built around our sensor Cairsens, we developed several measurement solutions – Cairnet, Cairtub and Cairclip – depending of the requirement in autonomy, remote data access, number of pollutants measured

## Applications



The detection of pollutants and odorous gases at really low levels of concentration and their continuous measurement are incredibly powerful tools, used today in a wide variety of applications : wastewater

## Measured pollutants



Our range of Cairsens sensors includes the following pollutants : O3/NO2, NO2, CO, H2S/CH4S, NH3, VOCnm, SO2, CH2O, CO2, PM ...

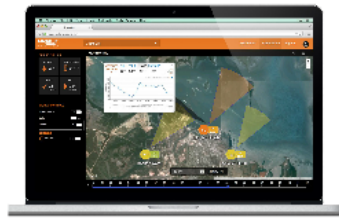
| Range                                            | 0-1000 ppb (0-950 ppb analog)                                                                                                |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Limit of detection <sup>(1)</sup>                | 30 ppb                                                                                                                       |
| Repeatability at zero <sup>(1)</sup>             | ±/- 5 ppb                                                                                                                    |
| Repeatability at 100% of range <sup>(1)</sup>    | ±/- 10%                                                                                                                      |
| Linearity <sup>(1)</sup>                         | < 10%                                                                                                                        |
| Uncertainty                                      | < 30 % R-N                                                                                                                   |
| Short term zero drift <sup>(1)</sup>             | < 4 ppb/24 H                                                                                                                 |
| Short term span drift <sup>(1)</sup>             | < 2% FS <sup>(2)</sup> /24 H                                                                                                 |
| Long term zero drift <sup>(1)</sup>              | < 8 ppb/3 month                                                                                                              |
| Long term span drift <sup>(1)</sup>              | < 2% FS <sup>(2)</sup> /3 month                                                                                              |
| Rise time (T10-90) <sup>(1)</sup>                | < 90s (180s if large variation RH)                                                                                           |
| Fall time (T10-90) <sup>(1)</sup>                | < 90s (180s if large variation RH)                                                                                           |
| Effect of interfering species <sup>(1)</sup>     | Other VOC <sup>(3)</sup> (SO2, CO, C2H4, C2H6, C3H8, ...) < 100%<br>Oxidant species negative interference (O3, NO2) : ~ 30 % |
| Temperature effect on sensitivity <sup>(1)</sup> | < 0.5 % / °C                                                                                                                 |
| Temperature effect on zero <sup>(1)</sup>        | ±/- 50 ppb maximum under operating conditions                                                                                |
| Maximum exposure                                 | 50 ppm                                                                                                                       |
| Annual exposure limit (1 hour average)           | 5 000 ppm                                                                                                                    |
| Operating conditions                             | - 30°C to 40°C / 15 to 95% RH non-condensing<br>2013 mbar ±/- 200 mbar                                                       |
| Recommended storage conditions                   | Temperatures: between 5°C and 20°C<br>Air relative humidity > 15% non-condensing                                             |
| Power supply <sup>(1)</sup>                      | 5 VDC/500mA (rechargeable by USB via PC or 500V-240V/5V 0.8A-1.0A with a duplax)                                             |
| Communication interface                          | USB, UART<br>Analog (UART & 4-20 mA / 0-5 V converter)                                                                       |
| Dimensions                                       | Diameter: 32mm - length: 62mm                                                                                                |
| Weight                                           | 55g                                                                                                                          |
| Protection                                       | IP42 (according IEC60529)                                                                                                    |



desde cualquier lugar.

# Opción módulos

### Monitoreo; arcos de influencia



### Sistema de alertas configurable



### Modelización on line predictiva



### Gestión predictiva de riesgos

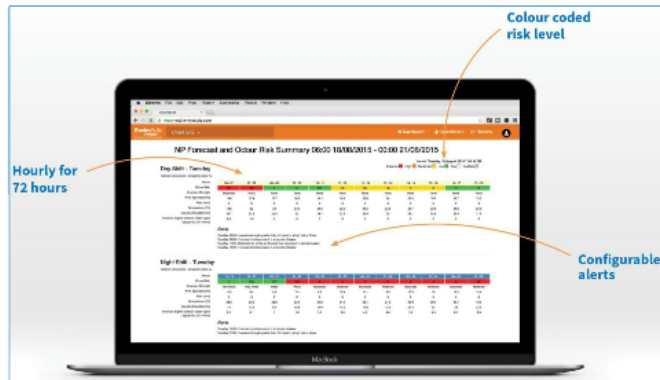
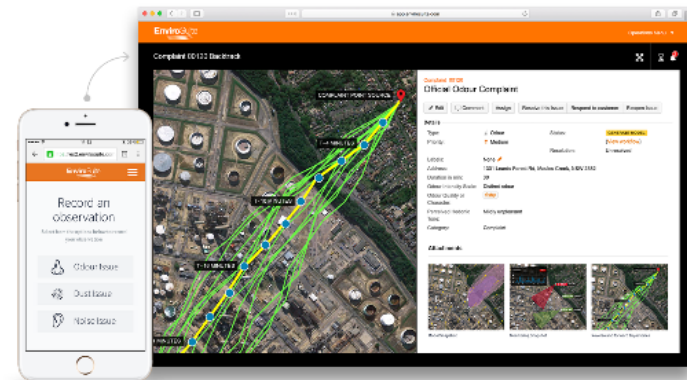
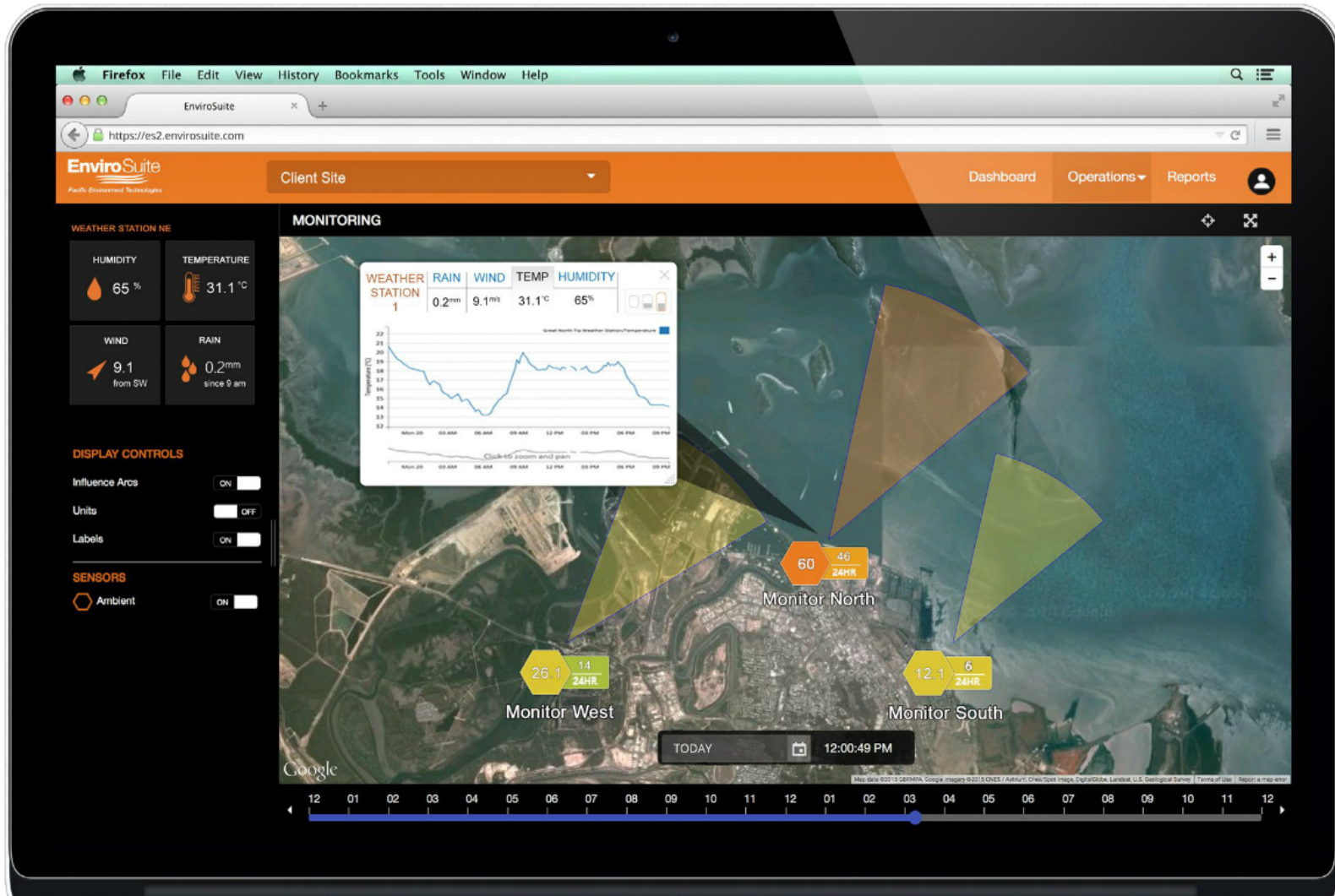


Figure 4-2: Example of a predictive risk report - Prediction of odour risks three days in advance

### Gestión de quejas, análisis de trayectorias, identificación de focos



# Monitoreo; arcos de influencia





## Sistema de alertas configurable



# Modelización on line predictiva

## Planee sus operaciones de forma eficiente

Predicción de riesgos diaria para poder evitar incidentes de forma total o estar preparado para el tiempo de mayor riesgo.

Recibe un informe de predicción de tres días cada mañana para que pueda tomar decisiones operacionales fundamentadas y reducir situaciones de riesgo. Simule modelos para ver cómo sus operaciones impactarán en el medio y tome decisiones basadas en circunstancias medioambientales óptimas.

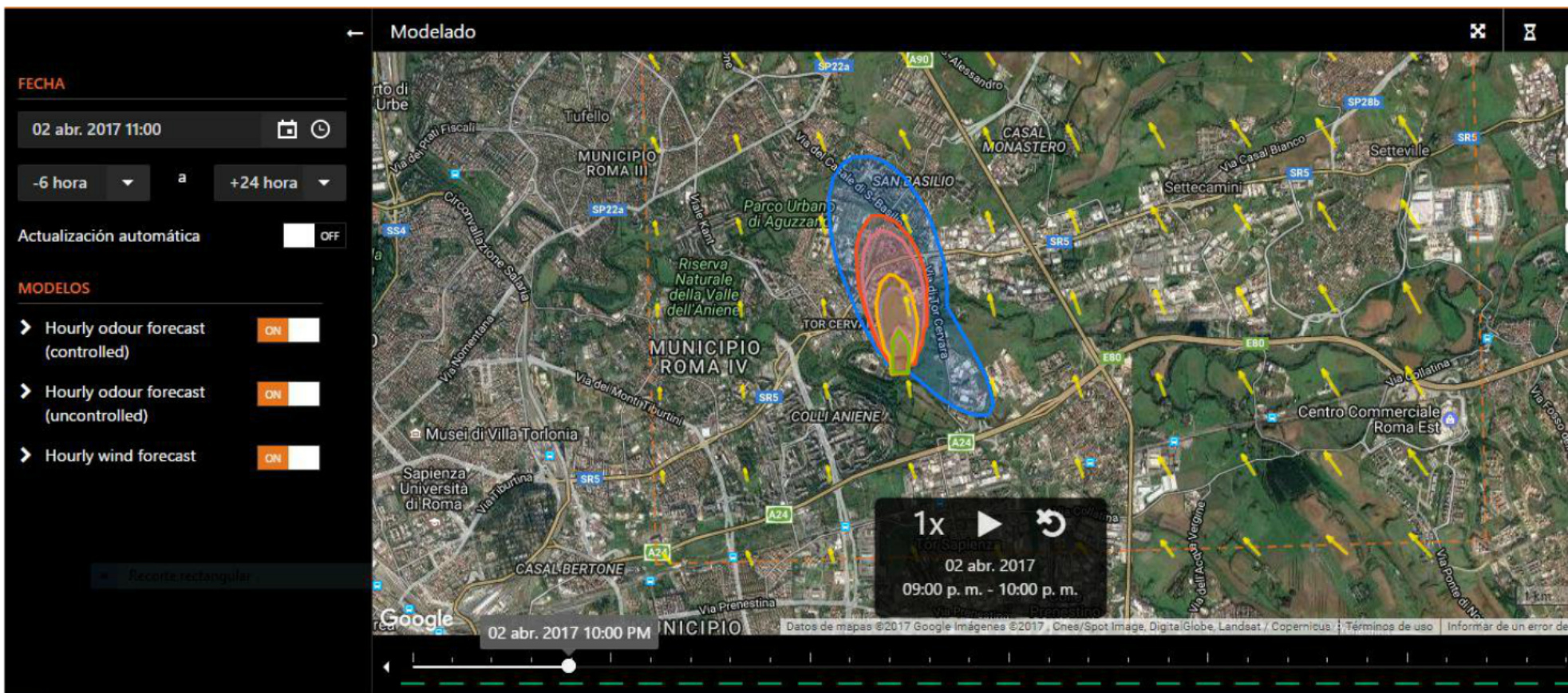


EnviroSuite

www.envirosuite.com

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# Gestión predictiva de riesgos

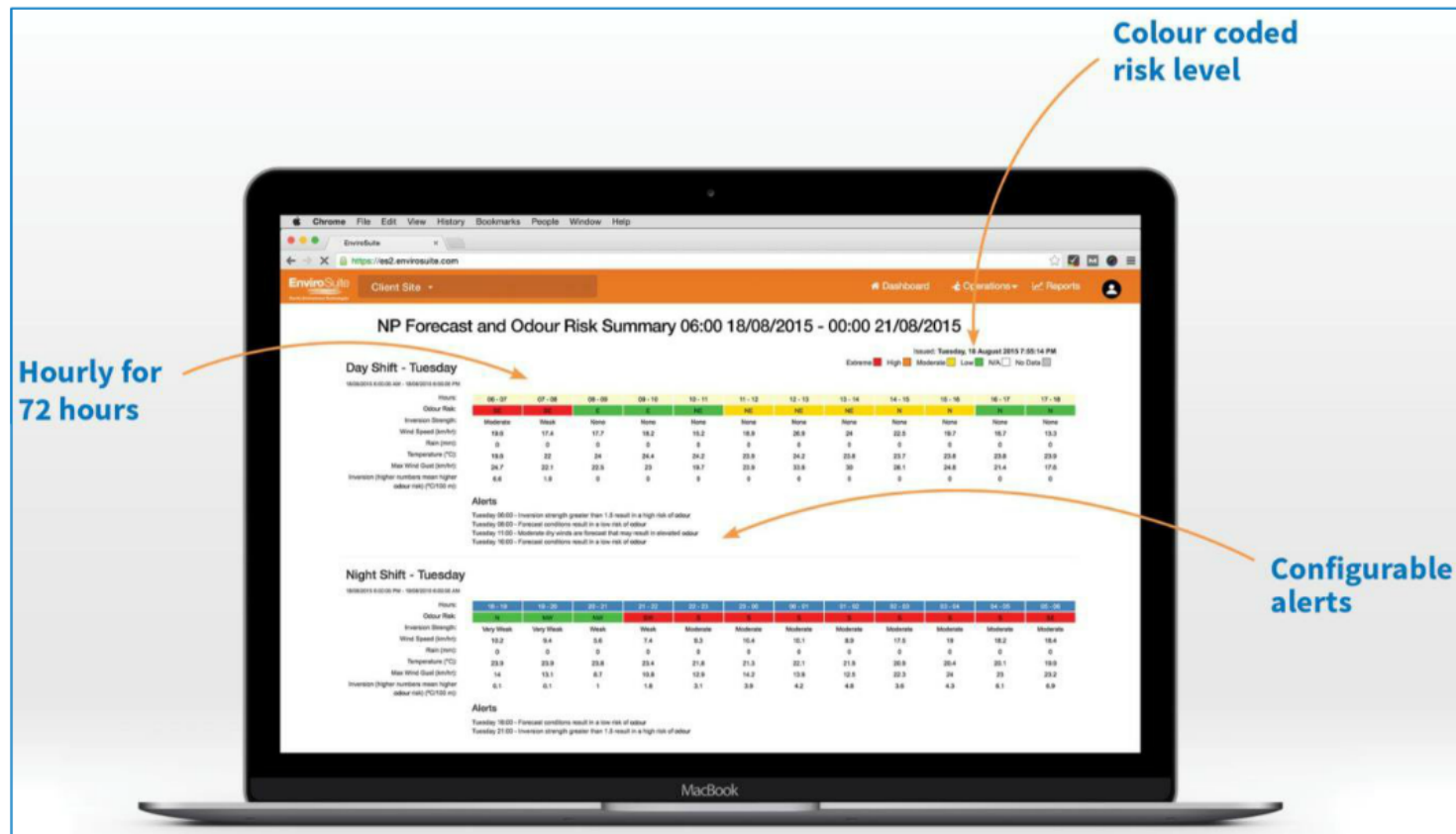
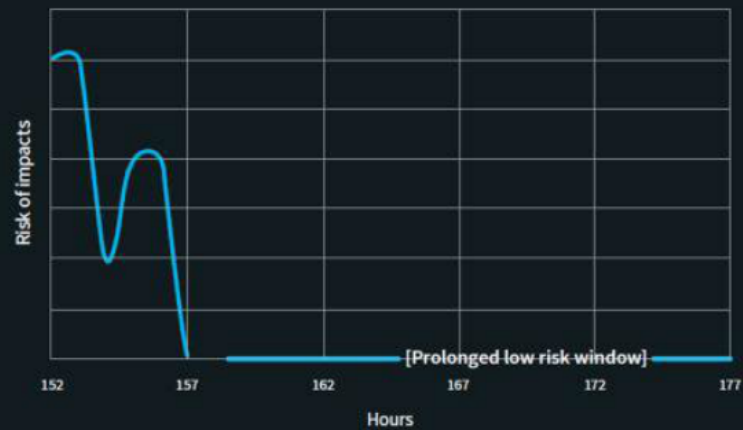


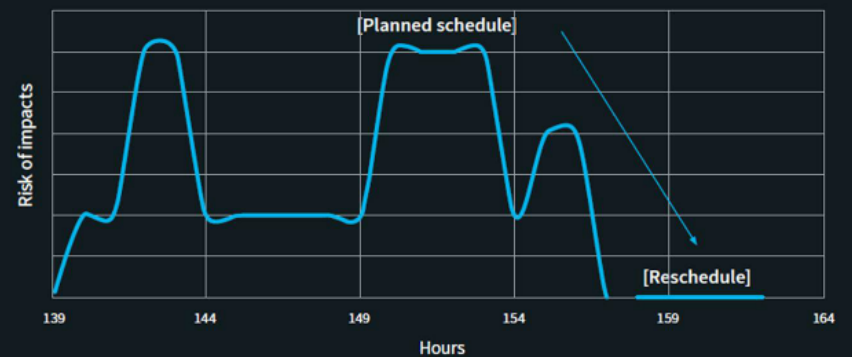
Figure 4-2: Example of a predictive risk report - Prediction of odour risks three days in advance



## Optimise odour control



## Avoiding odour impacts with risk forecasts





# Gestión de quejas, análisis de trayectorias, identificación de focos

The image displays the EnviroSuite application interface, showing a mobile app on the left and a web browser on the right, both displaying the same data.

**Mobile App Interface (Left):**

- Header: EnviroSuite
- Section: Record an observation
- Text: Select from the options below to record your observation
- Options:
  - Odour Issue
  - Dust Issue
  - Noise Issue

**Web Browser Interface (Right):**

- Header: EnviroSuite, app.envirosuite.com, Operations Menu
- Section: Complaint 00120 Backtrack
- Main Map: Aerial view showing a complaint point source (red dot) and multiple green trajectory lines with blue dots indicating time intervals (T-4 MINUTES, T-10 MINUTES, T-16 MINUTES).
- Complaint Details (Complaint 00120 Official Odour Complaint):
  - Buttons: Edit, Comment, Assign, Resolve this issue, Respond to customer, Reopen issue
  - Details:
    - Type: Odour
    - Priority: Medium
    - Status: [GENERATE MODEL](#) (View workflow)
    - Resolution: Unresolved
    - Labels: None
    - Address: 1301 Leards Forest Rd, Maules Creek, NSW 2382
    - Duration in min: 30
    - Odour Intensity Scale: Distinct odour
    - Odour Quality or Character: fishy
    - Perceived Hedonic Tone: Mildly unpleasant
    - Category: Complaint
  - Attachments:
    - Model Snapshot
    - Monitoring Snapshot
    - Reverse and forward trajectories

Enviado

Reservado

Procesado

Problemas

Queja

CN

Nombre Compañía

En ruta

Quejas

Informes

Estados de quejas

Comentarios

Queja Resuelta

Queja 2016-01-01

Queja Oficial de Olor

Editar

Comentar

Asignar

Responder a esta queja

Responder al cliente

Resolver queja

Detalles

Título

Descripción

Estado

Asignado a

Presentada por

Votos

Observadores

Fecha

Prioridad

Dispositivo

Dispositivo móvil

Señal de intensidad

Calidad de

Calidad de

15/08/2016

Media

En Rutas

John Smith

Dave Jones

0

1

Ninguno

1301 Lewis Forest Rd, Maunabo, HI 96751

30

Personas

Asignado a:

Presentada por:

Votos:

Observadores:

John Smith

Dave Jones

0

1

Asignar

Asignar

Votar incidencia

Comentar a observar esta incidencia

Solicitar Servicio Técnico

Tipo solicitud:

Estado cliente:

Canal:

Ver solicitud del cliente

Presentar una queja oficial de Olor

Generar Modelo

Portal

Actualizado:

15/Ago/16 10:00 AM

Adjuntos



Trazectoria enviada

15/Ago/16 - 3:04pm



# Foco de riesgo de quejas

Visualice las áreas clave de interés con el mapeo de focos de riesgo de quejas.

Utilice esta información para comprender las tendencias y el origen de los problemas que conducen a las quejas.



Visualización alternativa de mapa de calor

## Valor añadido de EnviroSuite

Optimización operaciones  
CONTROL AMBIENTAL

Retrasar y  
redimensionar  
inversiones

Reducir impacto en  
población

Mejora operaciones  
planta y equipos

Reducir costes de  
operación

Identificar y resolver  
incidencias en  
procesos

Mejora relaciones con  
población y autoridad

Investigación más  
eficiente

Defensa y apoyo a  
expedientes  
sancionadores



## Criterios de importancia en una plataforma digital

- Un **producto maduro**: base de clientes que lo utilicen en sus sistemas de control operacional (i.e. no proyectos piloto).
- **Escalabilidad**: capacidad para 1 ó 20 plantas.
- **Equipo de soporte** con experiencia.
- **I+D propia**, no sujeto a subvenciones puntuales.
- Sistema de ticketing y análisis de quejas integrado (**trayectoria inversa y futura**).
- **Arcos de influencia** (identificación del área de donde proviene el impacto)
- Diseño para **análisis y respuesta inmediata**, centrado en necesidades operacionales.
- **Fácil** de usar e interpretar.
- **Soporte de socios locales** y equipo especializado.
- **Agnóstico en equipos** – no comprometido con marcas específicas de hardware o sensores.
- **Amplio abanico de suscripción individual** – monitorización, modelos, pronóstico, análisis, alertas, informes y ticketing en una única plataforma.

# Muchas gracias por su atención



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