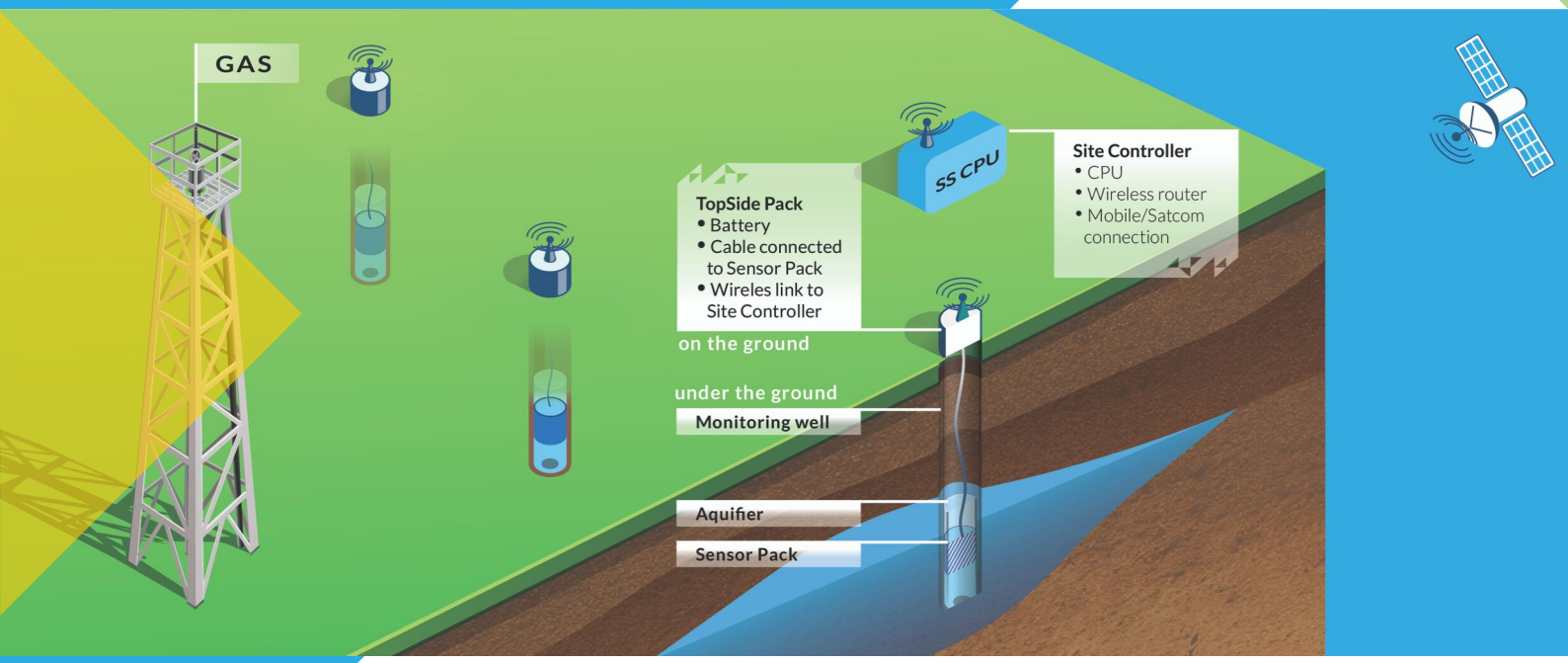
SHALESAFE

Shale Gas Operators with automated, in situ site environmental monitoring



Alerts whenever any pollution is detected.

Greater security for Citizens, Operators, Regulators and Policymakers

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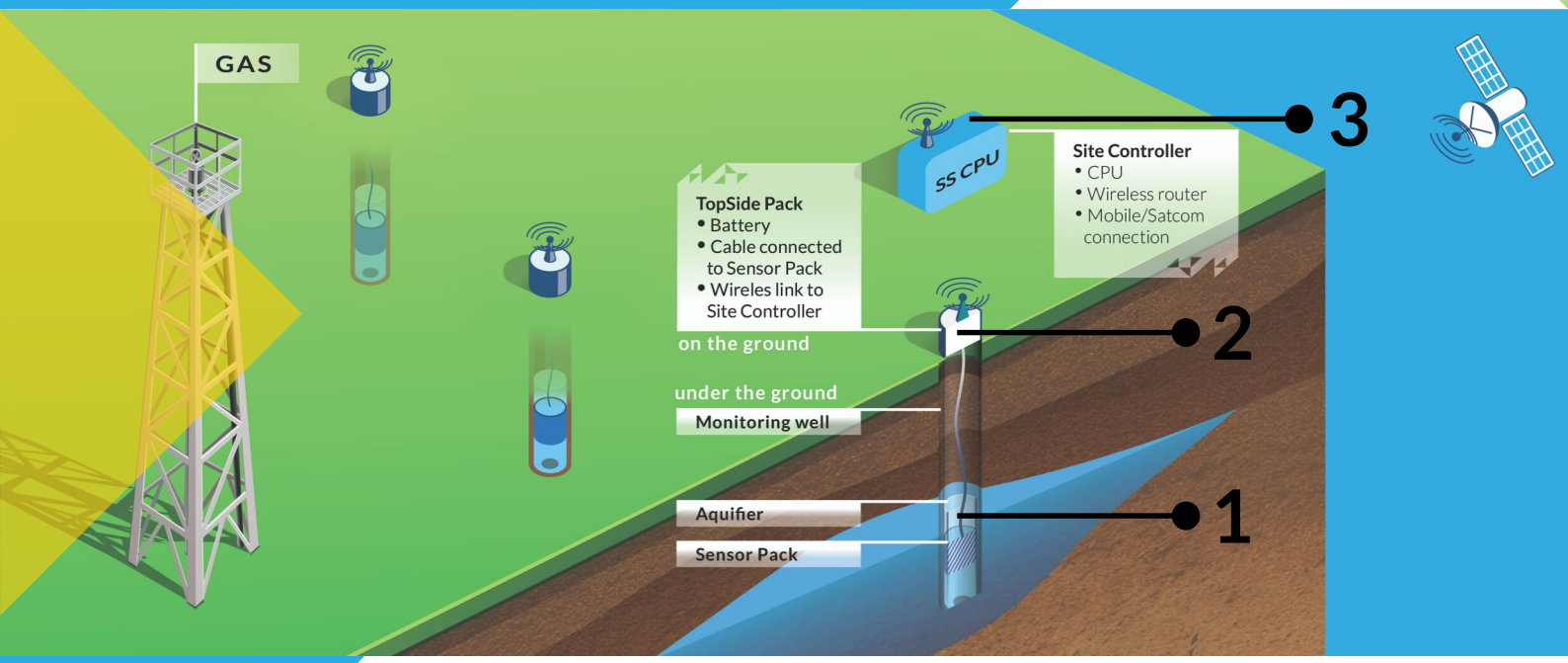
How ShaleSafe works



1. Sub-Surface Sensor Packages

- Sits within the aquifer at the bottom of monitoring wells
- Contain state-of-art sensors that detect possible contamination of the acquifer
- Each sensor is connected to a surface package for data collection and transmission

2. Surface Packages

- Connected to sub-surface packages via an umbilical cable
- The cable supplies the sensor package with power and enables the data to be transmitted to the surface package
- The surface packages are wirelessly connected to a site controller package

3. Site Controller Package

- Handles the collection and storage of data
- Has a user interface that allows the data to be visualised and analysed locally
- Data can be send to the outside via a central remote server
- It can send warnings and alarms to each site within minutes

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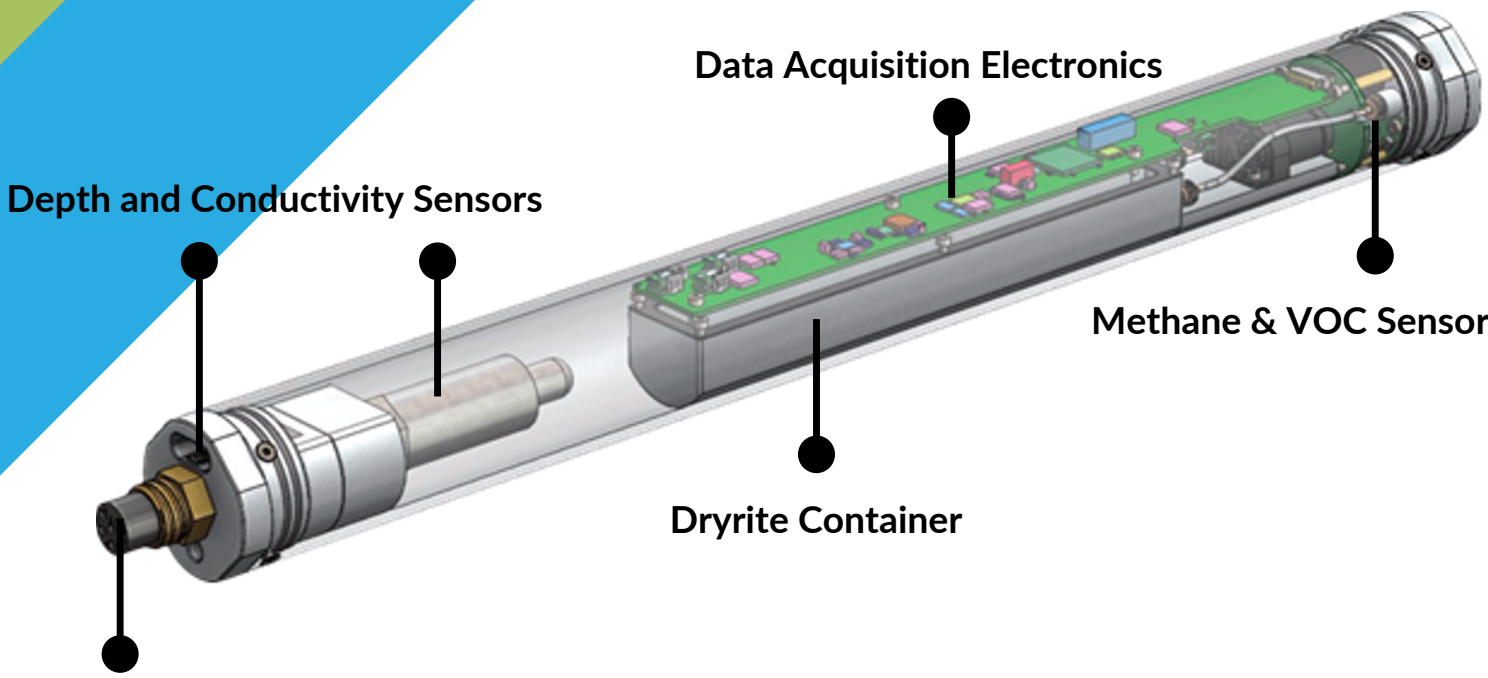
The ShaleSafe Sensor Unit

A four-part assembly comprising:

- Outer casing
- Main Body including the Internal Electronics and Desiccant Reservoir.
- Bottom Cap with Sensor Electronics
- Top Cap with Pressure/ Conductivity Sensors



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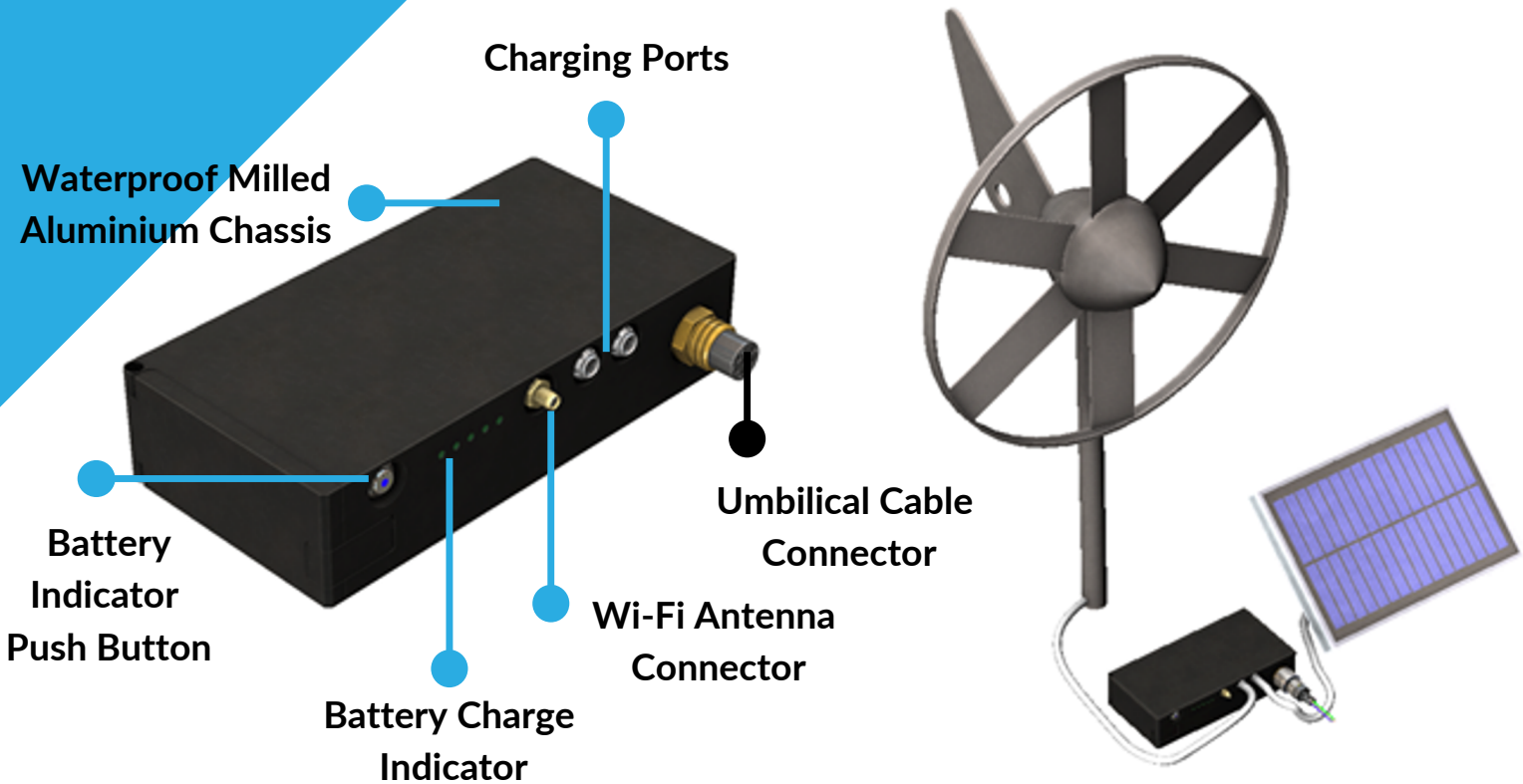
The Surface Unit

Each Sensor Unit is supported at the top of the monitoring well by a Surface Unit from which it is supplied power, and control commands and to which it sends its processed measurement data.

The Surface Unit is a ruggedized module, which is intended to be operational for long durations in any weather condition.

The unit includes a 97Whr Lithium Ion rechargeable battery with two charging connectors to allow power input from a Wind Turbine and / or a Solar Panel.



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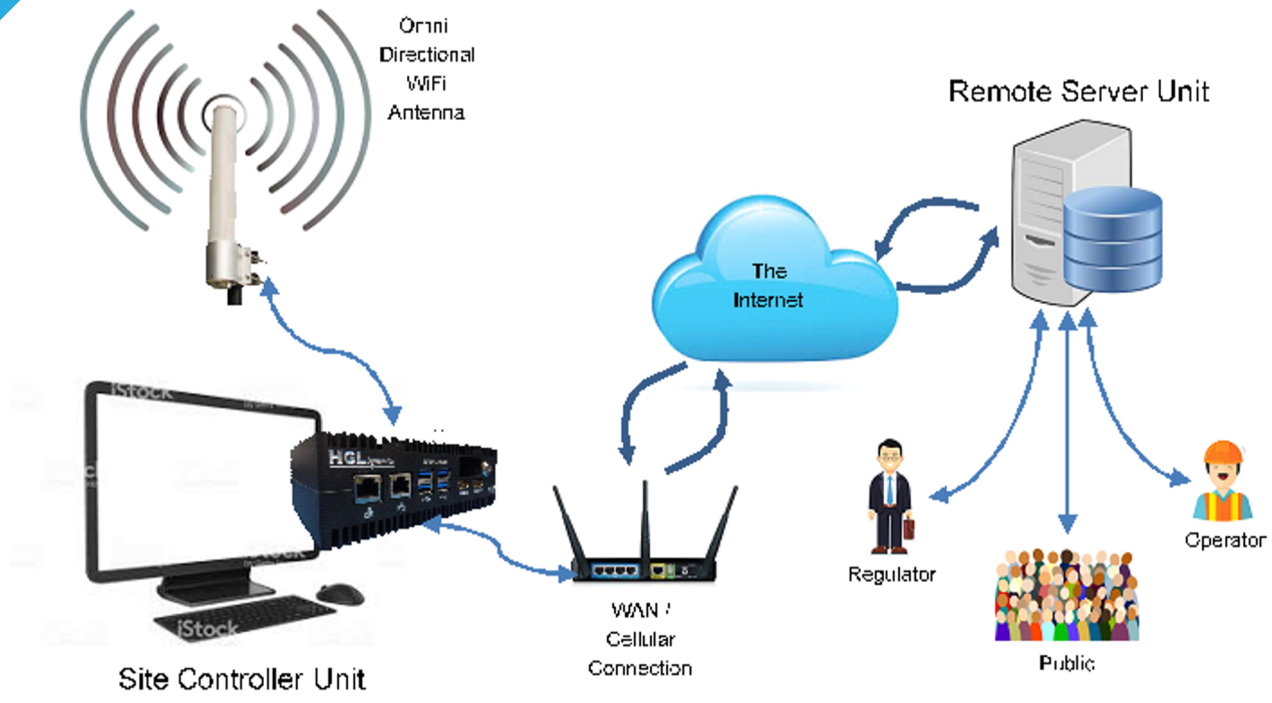
Site Controller

Each Shale Gas / Oil Drilling site will have multiple monitoring wells each of which may have a ShaleSafe Sensor Unit with its associated Surface Unit and Umbilical Cable.

Site Controller Unit is centrally located and includes a WiFi transceiver linked to an Omni-directional antenna. An arrangement like this together with high gain Yagi type antennae on the Surface Units allows distances of 300-400m to be covered with ease.

The Site Controller Unit hardware is a relatively simple PC with an optional keyboard, mouse and screen for local control and monitoring purposes. The unit includes the WiFi transceiver mentioned above and also ideally a Wide Area Network (WAN) or Cellular network connection to the outside world to allow remote control and remote transmission of measurements for storage and further analysis at a central location, if required.



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