<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>Founded by Roger Parker</td>
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<tr>
<td>1965</td>
<td>First Suspended Solids Monitor</td>
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<tr>
<td>1970</td>
<td>Moved to Cornwall</td>
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<tr>
<td>1974</td>
<td>First Automatic Sludge Blanket Monitor</td>
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<td>1980</td>
<td>First Self-Cleaning Suspended Solids Sensor</td>
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<tr>
<td>1995</td>
<td>Introduced Microprocessor Based Monitor</td>
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<td>1996</td>
<td>ISO90000 Accreditation</td>
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<tr>
<td>2000</td>
<td>Management Buy Out</td>
</tr>
<tr>
<td>2004</td>
<td>Launched System build Division</td>
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<tr>
<td>2006</td>
<td>Inlet Phosphate forward control introduced</td>
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<tr>
<td>2007</td>
<td>Awarded 1st MCERT for Turbidity Monitor</td>
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<tr>
<td>2011</td>
<td>WaterWatch² product range introduced</td>
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<tr>
<td>2012</td>
<td>MCERT Renewed</td>
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Feed Forward Improving P removal

1. Inlet Reactive Phosphate Concentration
2. Inlet Flow
3. Simple control by Load Calculation
4. Link output to Chemical Dosing Plant
5. KIS – keep it simple
Basic Principle Phosphate Removal

- Measurement: Continuous, Real Time, Simple
- Set Points: Operator, Parameters
- Adjustment: Reactive Phosphate, Flow
- Control: Load signal, Chemical dose
- Result: Tighter Control, Chemical Saving

Simple measurement with simple control
Phosphate Trend

Inlet Phosphate

Date & Time

mg/l as P
The original System 2006

And Still working !!
Typical Inlet Diurnal
Trend during Initial Trial

11th Oct P, Dose, Flow

12th October Flow, P and Dose
Proving Trend from Initial Trial

13th All Charts

Time

mg/l as P

I/sec, l/hr (Dose)

13/10/2005

Dose

Flow
Real Site Data
Sampling is the key

Sample Pump

Filter Unit
Integrated Package

- Analyser
- Compressor
- Secondary Sample pump
- Filter Unit
- Sample Pot
The Analytical Section

- Standard “blue book chemistry method”
- Robust chemistry module
- Heated reaction
- Automatic calibration and Reagent Blank
- Chemical clean of flow cell automatically on every calibration
- Single non flow dependent peristaltic pump
- Visible reaction in perspex cylinders
Final Effluent

- Twin Chemistry Module for Total Iron and Total Phosphorus
- Robust chemistry module
- Heated reaction
- Automatic calibration and Reagent Blank
- Chemical clean of flow cell automatically on every calibration
- Single non flow dependent peristaltic pump
- Visible reaction in perspex cylinders
Ortho-Phosphate is the form of phosphorus measured using the standard “Blue Book” method of Molybdenum Blue and is reported as P not PO$_4$

The reason for this is two fold:

Fast simple chemistry

Measures just the dissolved Phosphates

Consent is Total Phosphorus and traditionally ortho-phosphate is measured by test kit on the final effluent, there is a relationship between ortho-phosphate and Total phosphorus which is site related. As a rule of thumb the Total Phosphorus is 0.3 to 0.5 higher than the ortho-phosphate when quoted as P.

PO$_4$ relationship to P is:

$31 + (16) \times 4 = 95$ (atomic weight)

$95/31 = 3.06$

Therefore the result for PO$_4$ is 3.06 times higher than P
The reason we succeeded in the analysis of crude sewage:

The sample is filtered and then diluted this removes all the turbidity effects and allows us to use the simple chemistry. As the method is only linear to 6 mg/l as PO$_4$ but as we use dilution of at least 1 in 10 we can accommodate the higher ranges.

We do not run the filter unit continuously but control the complete cycle from the analyser and it’s associated controller /PLC.

**Note:**
The determination of Total Phosphorus in the crude sewage could NOT be performed on the inlet as much of the phosphorus is bound up in the solids and therefore the solids would have to be sampled and analysed as well. As part of the set up / commissioning of this system an analyser is situated at the final effluent and the Iron to P ration can be adjusted to achieve a compliant final effluent which will take into account total phosphorus and solids.
What is Next

• We need to know what you want

• Our Latest Ideas:
  ➢ Simple multiple wavelength UV Monitor
  ➢ Non reagent Phosphate Monitor or Test Kit
  ➢ Low Range Turbidity to control tertiary Filters
  ➢ Complete “One Stop Shop” all built off site
Increase the scope – reduce your risk

Partech want to be involved in the installation and commissioning of our products. If we are given the responsibility

- We will guarantee delivery of the products, on time and installed correctly
- We are only ones to blame if there is a problem
  - No more – it was installed badly, in the wrong place
  - No more – it was never commissioned
  - No more – it never worked...
- This means you can worry about the rest of project not the instrumentation
In a world facing ever tightening environmental regulations, we provide the measurement and analysis tools to help you improve your process control, reduce costs and prevent pollution incidents. Our expert knowledge, combined with market leading products make us the ideal partner for your monitoring needs.