

***SODIUM HYPOCHLORITE
PLANT***

NEW SYSTEM

- The Technology
- How does it work?
- Benefits
- What does it consist of?
- How is it operated ?
- What does it achieve ?

THE TECHNOLOGY

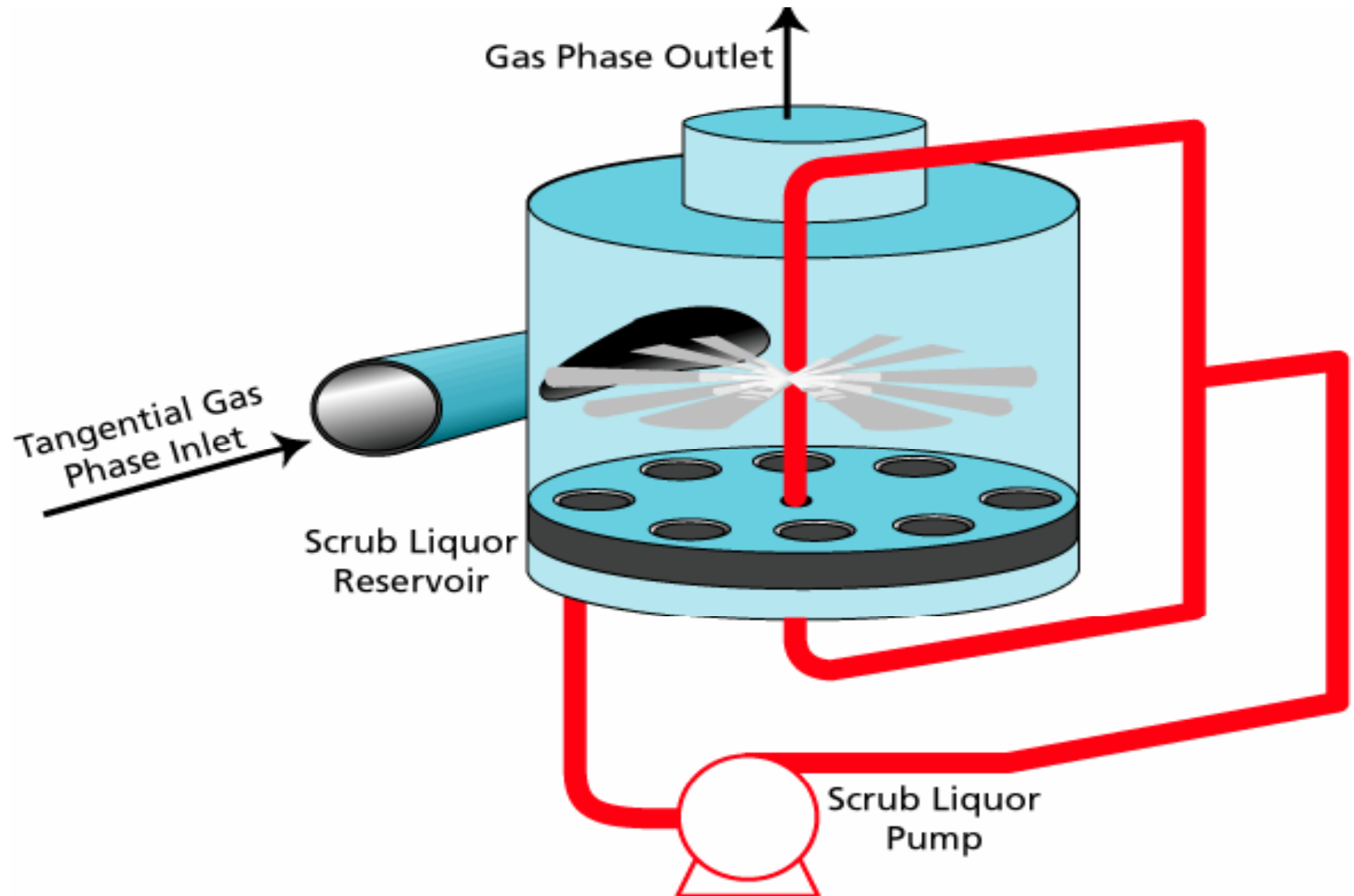
- Gas / Liquid contact device used to scrub gases
- Applicable to aggressive environment
- Compact units with no mechanical moving parts
- Resistant to blockages / fouling
- Essentially maintenance free



HOW DOES IT WORK?

- Gas phase enters scrubber tangentially
- Liquid phase dispersed into scrubber as a fine droplets
- Gas flows countercurrent to liquid droplet flow
- Gas Outlet situated at scrubber axis thus creating a vortex flow of gas

Power Fluidic Gas/Liquid Contactor



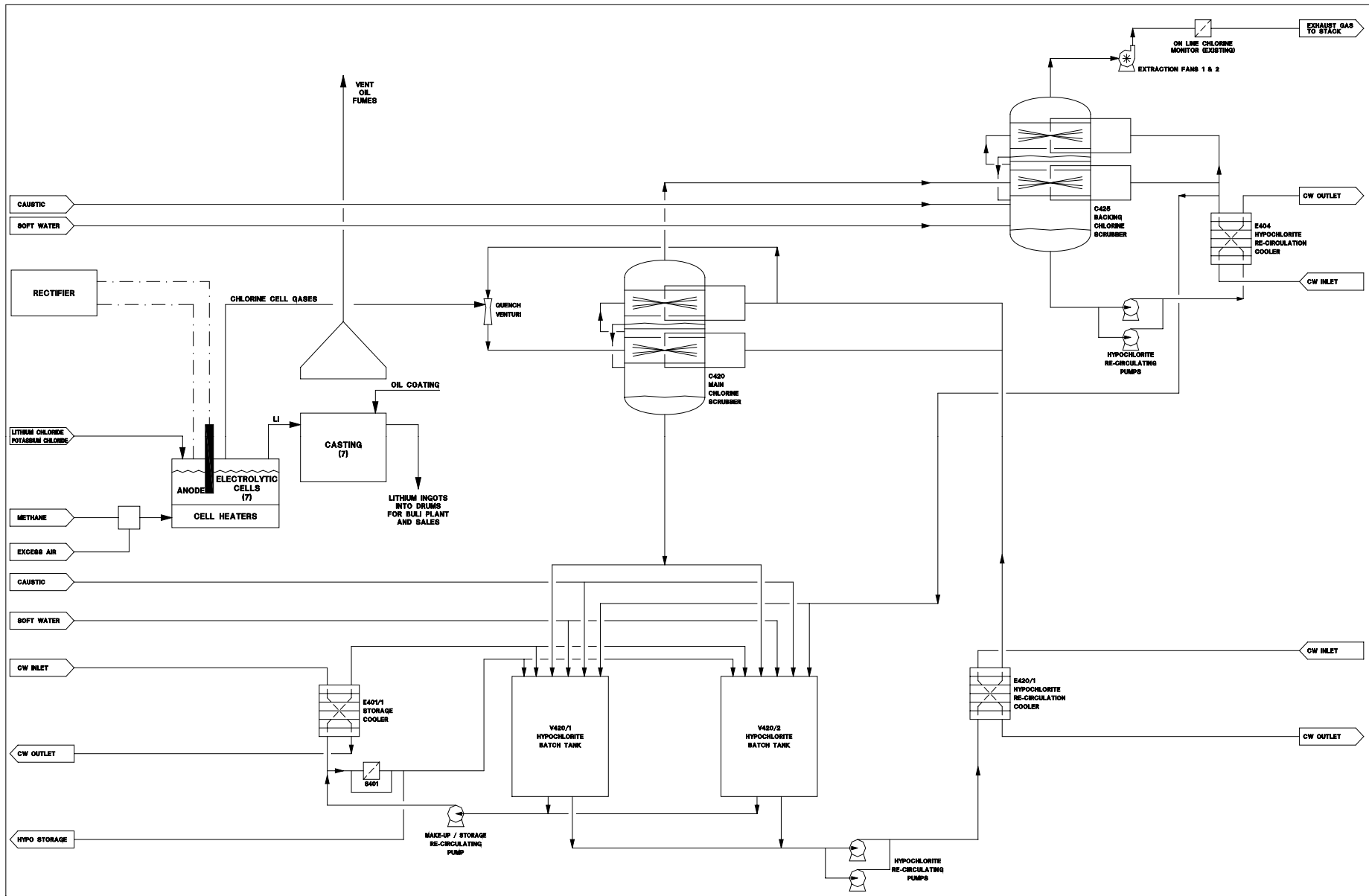


BENEFITS

- High mass transfer rate
- Good resistance to blockage and fouling through elimination of packing
- Efficiency dependent on liquor flow not gas flow
- Essentially maintenance free

WHAT DOES IT CONSIST OF?

- Two Scrubbers operating in series – Main & Backing
- Two batch tanks to allow continuous batch chlorination.
- Operation controlled via PLC
- Two on-line analysers utilised in process monitoring and control.



NOTES.

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|------------|-------------|---|----------|--|
| TITLE: | | METAL AND HYPOCHLORITE PLANT PROCESS DIAGRAM | | |
| PROJECT No | DRAWING No | SCALE | ISSUE | |
| | 2652 | N/A | 3 | |

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|------------|--------------------|------|
| DRAWING No | DESCRIPTION | ISS. |
| | REFERENCE DRAWINGS | |

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|------|--|---------|----------|------|------|
| ISS. | DESCRIPTION OF ISSUE | BY | DATE | APPD | DATE |
| 3 | UPDATED IN LINE WITH "HYPO UPGRADE" PROJECT. | D.Booth | 18-01-00 | | |
| 2 | REVISED IN LINE WITH LDOLAN COMMENTS | D.Booth | 07-04-97 | | |
| 1 | ORIGINAL ISSUE | D.Booth | 30-01-97 | | |

HOW IS IT OPERATED?

- Operation of valves & pumps is automatic; no manual intervention required by operator
- Operator initiates each stage of process through PLC
- Automatic batch changeover is initiated by NaOH on-line analyser
- Batch composition continuously monitored by the on-line analysers which store the data

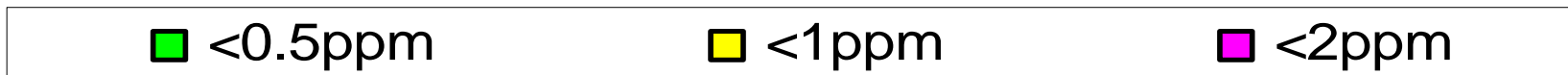
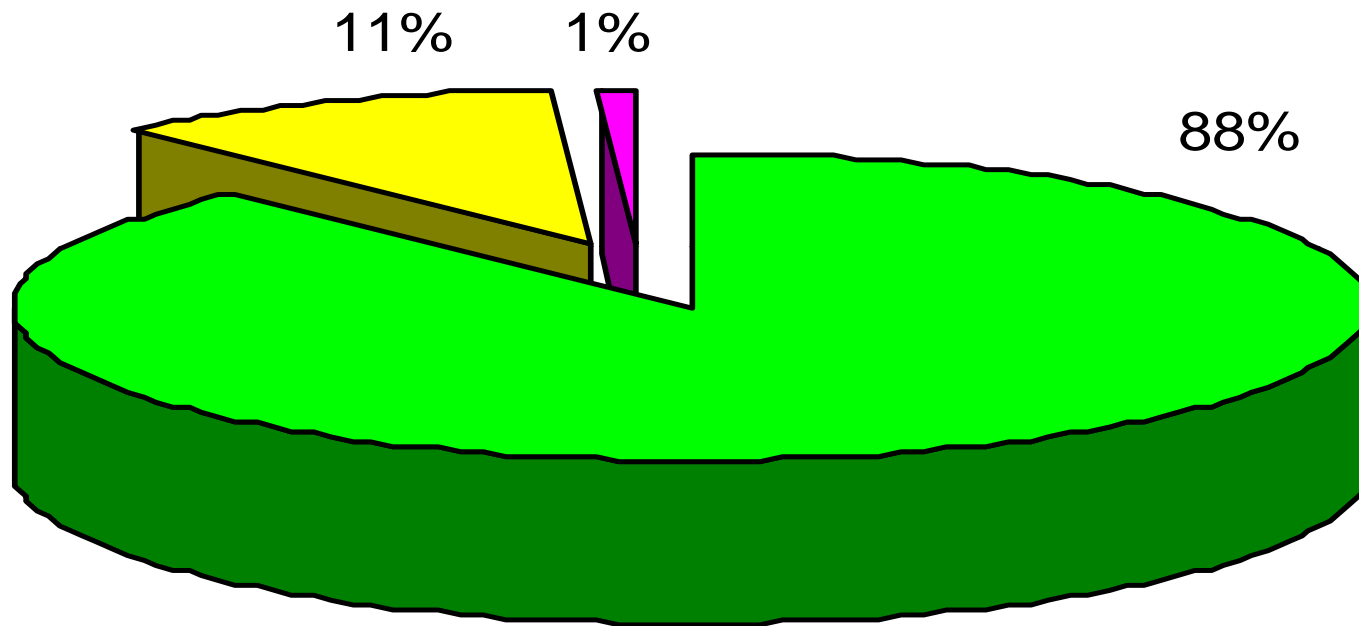
WHAT HAS IT ACHIEVED?

- Environmental :Reduction in Cl_2 emissions
- Product Quality:Reduction in $\%\text{Na}_2\text{CO}_3$
Increase in $\%\text{Av. Cl}_2$
- Commercial Benefits: Increase in quality due to increased Av. Cl_2

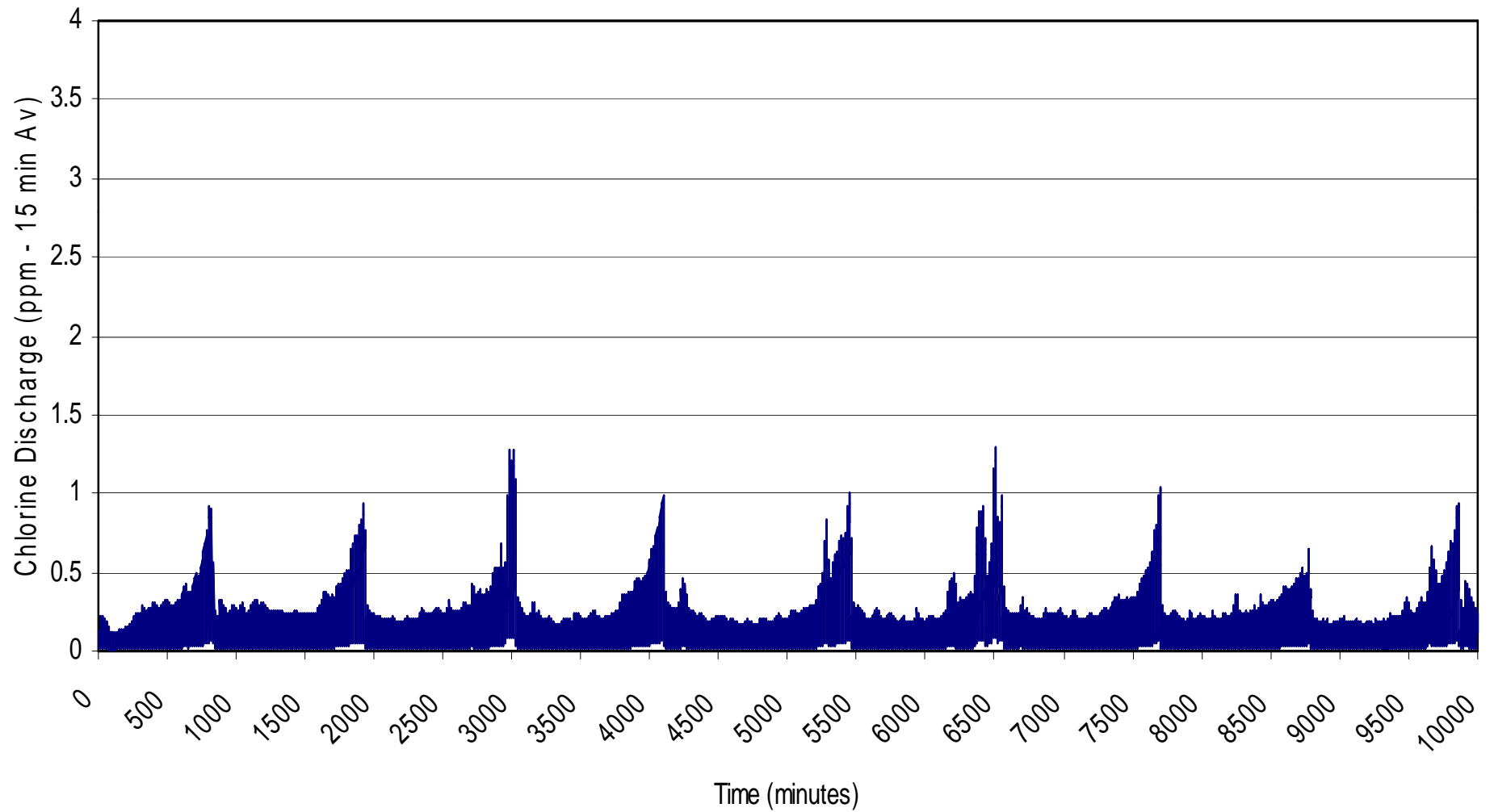
Chlorine Emissions – 15 Minute Averages

| Date | <0.5ppm | <1ppm | <2ppm | <3ppm |
|----------------|---------------|---------------|-------------|-------------|
| 14 – 16 Apr | 88.64% | 100% | 100% | 100% |
| 16 – 20 Apr | 83.95% | 99.01% | 100% | 100% |
| 20 – 27 Apr | 87.09% | 98.80% | 100% | 100% |
| 27 Apr – 5 May | 88.68% | 99.74% | 100% | 100% |
| 5 – 12 May | 91.25% | 99.41% | 100% | 100% |
| 12 – 19 May | 92.88% | 99.11% | 100% | 100% |
| 19 – 30 May | 85.77% | 98.76% | 100% | 100% |
| MEAN | 88.32% | 99.26% | 100% | 100% |

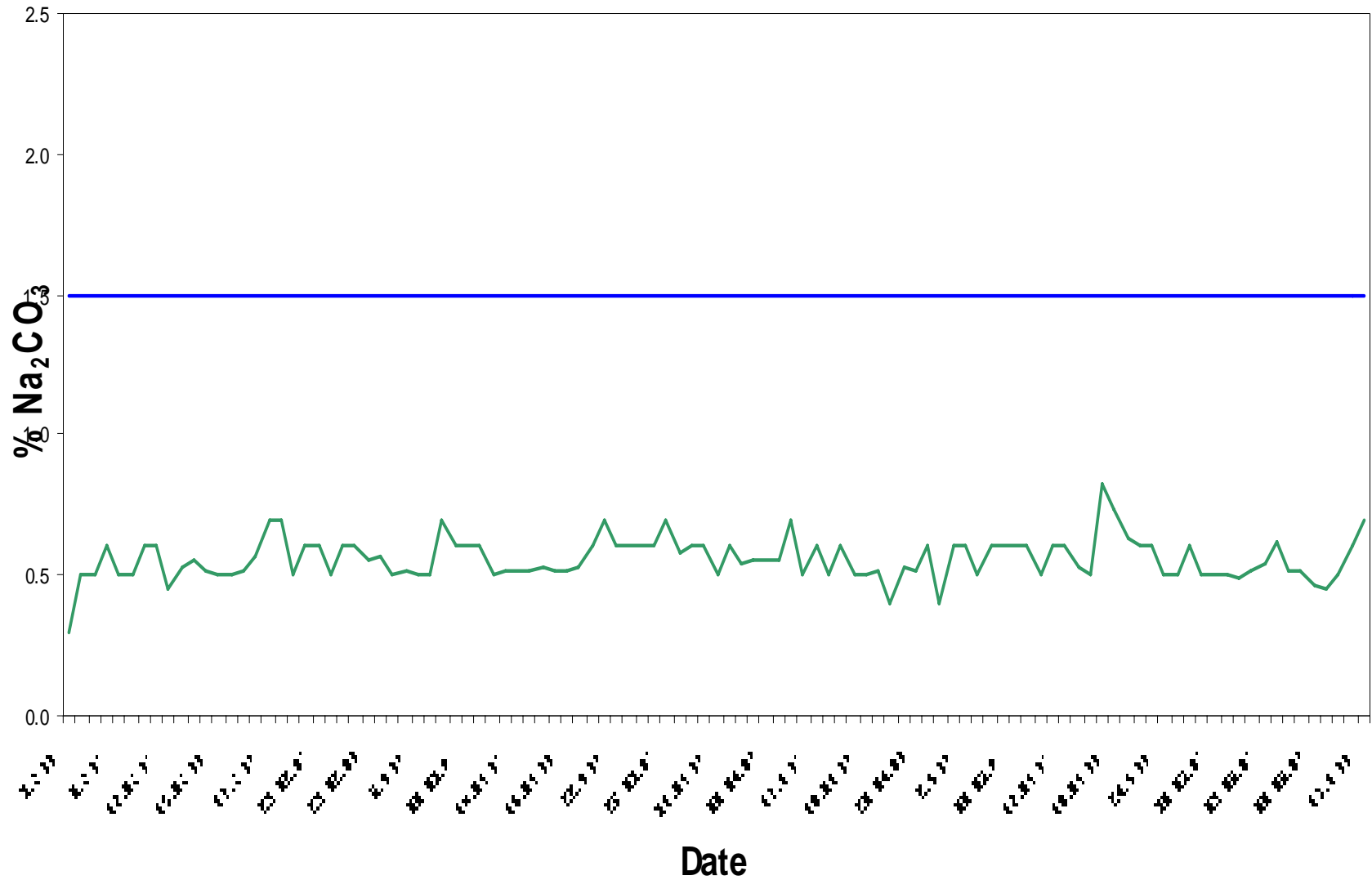
Cl₂ Emissions - 15 minute Averages



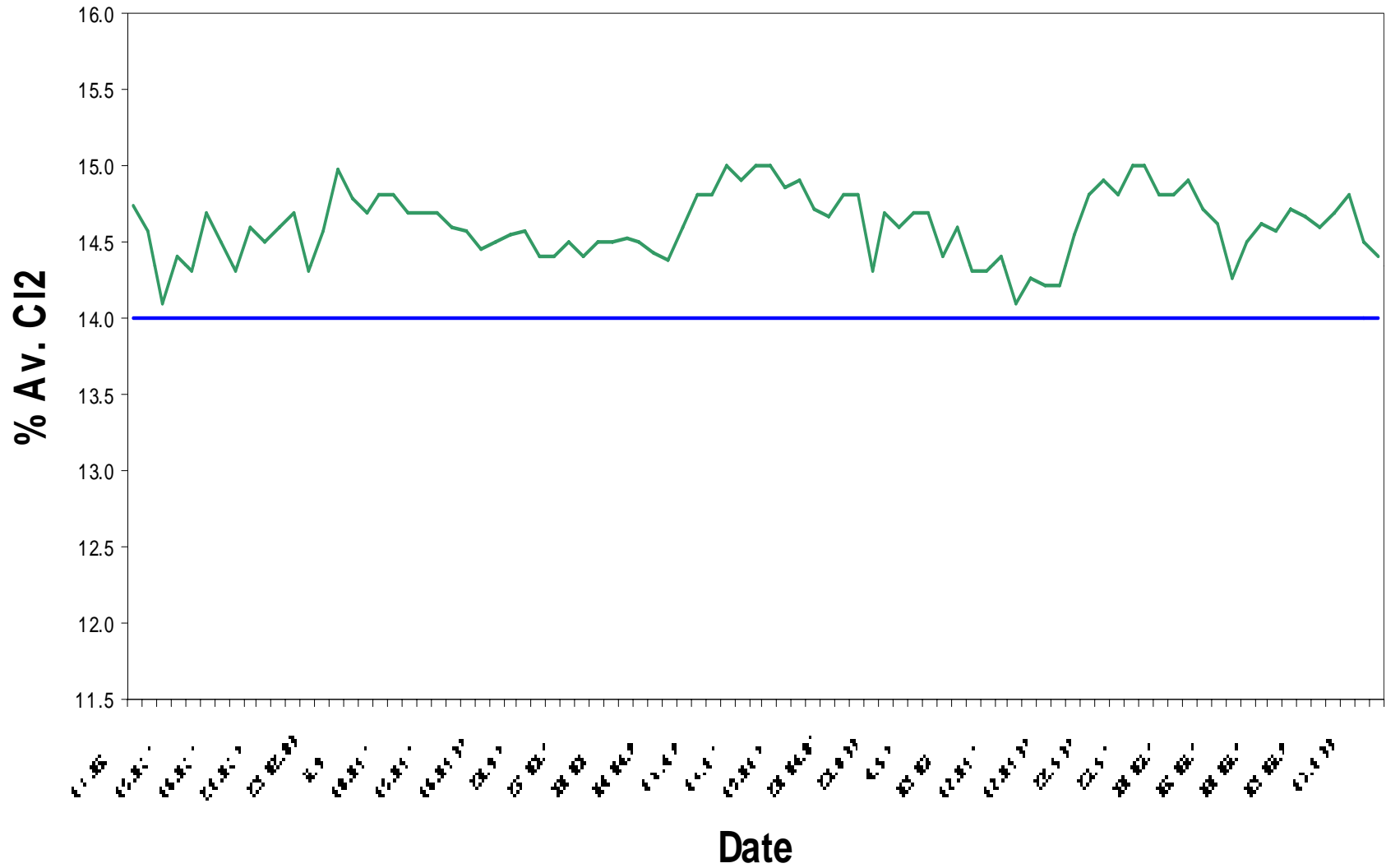
Outlet Chlorine Concentration (20 to 27 Apr) 15 min Average



% Na₂CO₃ in NaOCl



% Av. Cl₂ in NaOCl



WHAT HAS IT ACHIEVED?

- Operational benefits: Less labour intensive due to automatic operations and on-line analysis
- Better control: No longer reliant on operator interaction to control Cl₂ emissions
- Operator exposure reduction: Use of PLC to control operations