INDUSTRIAL WATER MANAGEMENT

IMPLEMENTATION

Richard Hill
Whitewater Ltd, UK
Implementation

- Legislation
- Environmental Policy
- Education
- Economics
Current legislation is not effective:

- If fines are too low it will be cheaper to pay the fine than to prevent pollution.
- If fines are too high industry will close the factory causing local hardship.
- Legislation will only be effective if individual company directors are held responsible.
## Legislation

### TOP 10 UK POLLUTERS 1998

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>TOTAL FINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICI Chemicals</td>
<td>£382,500</td>
</tr>
<tr>
<td>Tyseley Waste Disposal</td>
<td>£ 95,500</td>
</tr>
<tr>
<td>London Waste</td>
<td>£ 38,500</td>
</tr>
<tr>
<td>Wessex Water</td>
<td>£ 36,500</td>
</tr>
<tr>
<td>Alco Waste Management</td>
<td>£ 30,000</td>
</tr>
<tr>
<td>Anglian Water Services</td>
<td>£ 24,250</td>
</tr>
<tr>
<td>EOM Construction</td>
<td>£ 21,000</td>
</tr>
<tr>
<td>Shell (UK)</td>
<td>£ 20,000</td>
</tr>
<tr>
<td>BNFL</td>
<td>£ 20,000</td>
</tr>
<tr>
<td>Celtic Energy</td>
<td>£ 18,000</td>
</tr>
<tr>
<td>European Vinlys</td>
<td>£ 18,000</td>
</tr>
</tbody>
</table>

“Clearly this is not sending out a strong enough message to deter large businesses that have the potential to seriously damage the environment.”

Ed Gallagher  UK Environment Agency
What goes in comes out unless it stays there

Removing a contaminant from one phase into another is not the same as destroying it

gas emissions

sludge disposal
Environmental Policy

- Everything has to go somewhere
- Zero liquid discharge is possible
- Solid residue has to be disposed of
- Emissions to atmosphere may be unacceptable
Environmental Policy

- **Priorities**
  - environment or employment?
  - industry or agriculture/fisheries

- **Who should pay for pollution?**
  - industry?
  - government (that is the community)?
  - cui buono?
Environmental Policy

- Every factory is different
- Consents must balance
  - environmental protection
  - industrial activity
  - they must be “fair” to both sides
Education

- Environment protection agencies must work with industry
- Both sides must understand
  - the need for long term environmental protection
  - the need for short term economic solutions
- Good water management practices will achieve both
“When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, your knowledge is of a meagre and unsatisfactory kind.”

William Kelvin, 1894
Education

- Reduce water use by good manufacturing practice
- Reduce water contamination by good housekeeping
- Re-use water where possible
- Recycle water where practicable
- Recover raw materials
- Recover energy
Appropriate Technology

- Matches wastewater characteristics to discharge criteria and recycle quality
- Takes account of resources
  - utilities and chemicals availability
  - operating personnel
  - maintenance and spares availability
- Is economically viable
- Meets socio-political aspirations
Education

- Appropriate Technology
  - does not have to use “high tech” solutions
  - uses processes from other industries
  - needs the support of plant operators
Economics is the language of industry

Taxation (e.g., landfill tax) can be effective

Increasing mains water costs focus attention on water

Increasing sewer discharge costs focus attention on water

Wastewater should be a resource
The economic situation changes constantly

- new processes become cheaper with widespread use (e.g., membranes)
- landfill tax has made Advanced Oxidation Processes viable
- technologies for Zero Liquid Discharge will soon become economically viable
- sustainability can show economic benefits
Industry must see a financial benefit from implementing water management. Payback periods for industry are being reduced - 2 - 3 years is common.
So the message to industry is ...
Water Management

WATER MANAGEMENT SAVES MONEY
Summary

- Industrialisation is important to developing economies
- Water is important to a healthy population
- Industry has a duty of care to minimise impact on water resources
- Industry does not respond positively to legislation
- Industry does respond to cost savings
The Engineering Challenge

- Technology is the easy bit
- Implementation problems are
  - Economic
  - Political
  - Sociological
- Constraints change with time
- Education is the long term solution
Something to remember …

Believe nothing because a so-called wise man said it
Believe nothing because a belief is commonly held
Believe nothing because it is written in ancient books
Believe nothing because it is said to be of divine origin
Believe only what you yourself judge to be true

Siddhartha Gautama, The Buddha