



LEGIONELLA RISK ASSESSMENT

THE UK WAY

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UK AREA MANAGER - SOLENIS

PROFILE

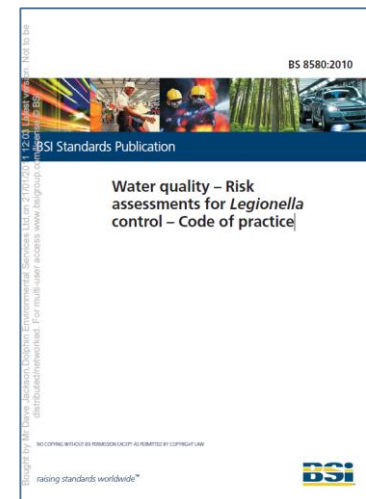
- 30 years in the water treatment industry
- Married with 2 boys
- Interests following UK Ice hockey
- Claim to fame
 - Once met David Bowie at one of our UK accounts



LEGIONELLA RISK ASSESSMENTS – UK POSITION

- Requirements under (UK) law
 - Health & Safety at Work Etc. Act 1974
 - Control of Substances Hazardous to Health Regulations 2002
 - Management of Health & Safety in Workplace Regulations 1999
 - (L8 - Approved Code of Practice 2013)

- Procedure for Assessments defined further in BS8580
 - “Water quality – Risk Assessments for Legionella Control – Code of practice”



GENERAL RISK ASSESSMENT

- Basic Premise: -
 - Identification of all Hazards
 - Assessment of whether Hazard can cause Harm (and likelihood)
 - Must be carried out by a Competent Person
 - Must consider all persons at Risk of Harm
 - Must be kept up to date – Review as Appropriate
- Same process applies to legionella, although more specialist knowledge likely required to carry out assessment

GENERAL RISK ASSESSMENT

- Usually a General RA looks at **Likelihood vs. Severity**
 - A Legionella RA does not need to consider severity as this is “a constant”, although...
 - Severity may be interpreted to mean different things
 - i.e. Will it cause a 1-off case or a large outbreak?
- Much better understanding of “Likelihood” is therefore required



Dirty vs
Clean etc.



WHAT CONSTITUTES A LEGIONELLA HAZARD?

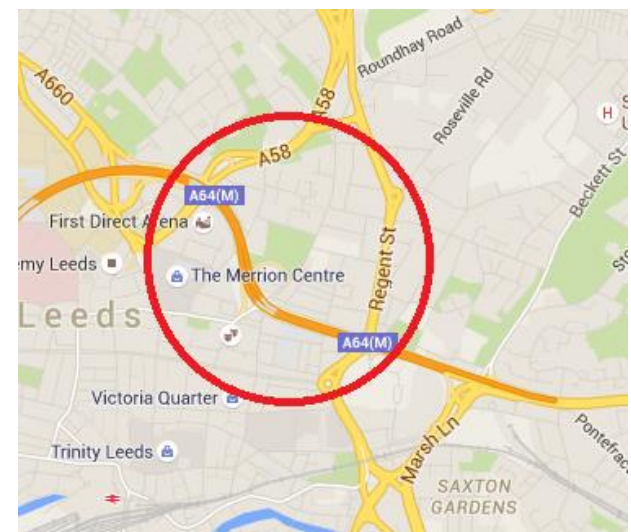
- HSE ACoP L8 (2013) Paragraph 23
 - There is a reasonably foreseeable risk of exposure to legionella bacteria in:
 - (a) cooling systems with cooling towers, evaporative condensers or dry/wet cooling systems;
 - (b) hot and cold water systems;
 - (c) spa pools (see paragraph 24);
 - (d) other plant and systems containing water that can create and increase the risk from legionella during operation or when being maintained (see paragraphs 13, 14 and 27).

WHAT CONSTITUTES A LEGIONELLA HAZARD?

- In essence: -
- Systems that have the potential for **bacterial multiplication**
 - Contamination, stagnation, elevated temperatures, scale / corrosion, neutral pH
- Coupled with: -
- Systems that have the potential to **create aerosols**
 - Cooling towers, showers, sprays, humidifiers, pressure washers, etc.

HOW DO WE TURN THAT INTO “RISK”

- Could **people** be exposed to the **system** identified as a hazard?
 - Who is exposed?
 - Where is system located?
 - Is exposure accidental? occasional? continual?
 - What are local population demographics? Are there any high risk groups?



RISK ASSESSMENT PROCESS

- Data capture – **Understand the Systems & Background**
 - Plant Operational Data
 - Schematics
 - Management Structure / Competency
 - Etc.

- For each system – **Understand the Risk**
 - 4 Stages that constitute Legionella Risk (Defined by HSE)
 - Can system become contaminated with Legionella?
 - Can the legionella bacteria thrive and multiply?
 - Can the system create an aerosol?
 - Can (susceptible) individuals be exposed?

- **The greater the number of “YES” responses above, the greater the risk**

INHERENT RISK VS INDIVIDUAL RISK

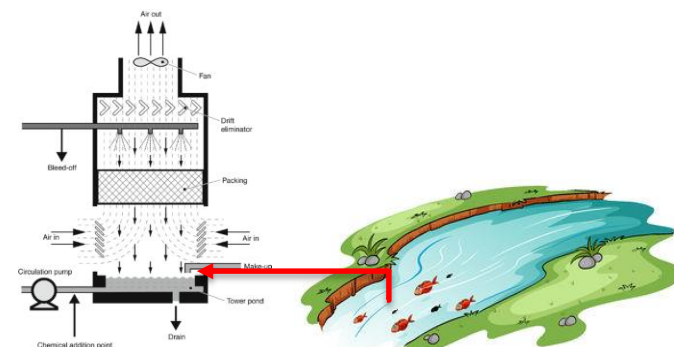
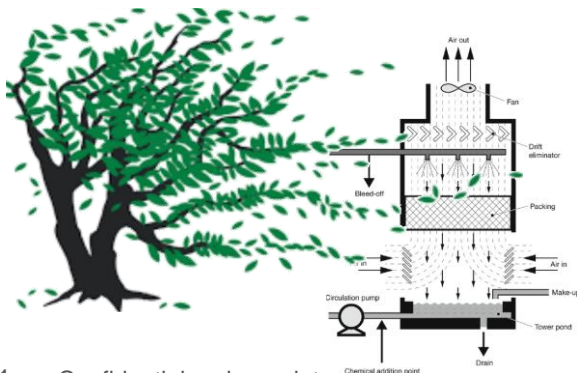


- Cooling Towers will always be a risk
 - Lots of aerosol
 - Large fan forcing water loss
 - Airborne contamination
 - Ideal temperatures
 - Located “outside”
 - Duty / standby (low flow) areas
 - Materials of construction

- This presents a general **INHERENT** risk

INHERENT RISK VS INDIVIDUAL RISK

- Individual Cooling Towers will pose individual risks
 - Local air contamination
 - Water supply
 - Operation of system
 - Process leaks
 - Condition of system
- **The assessment MUST look at the individual system risks**
 (...and controls MUST look at individual system needs)



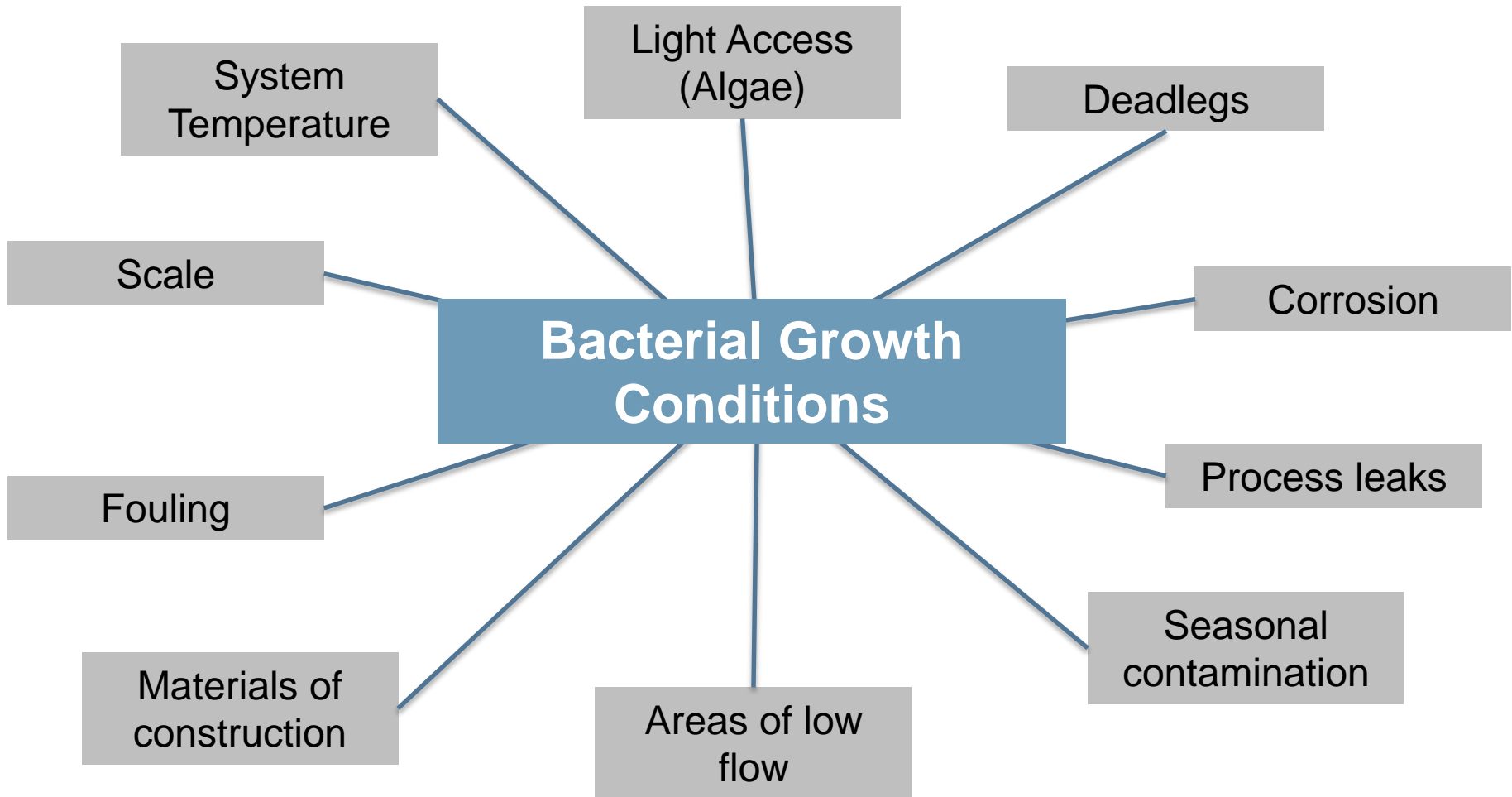
THESE AREN'T THE ONLY FACTORS

- In addition to the physical risk factors there are other influencers
 - How is the system managed / operated?
 - Are control measures aligned with specific system risks or “generic”
 - How well do site personnel understand legionella?
 - Are there external impact factors?

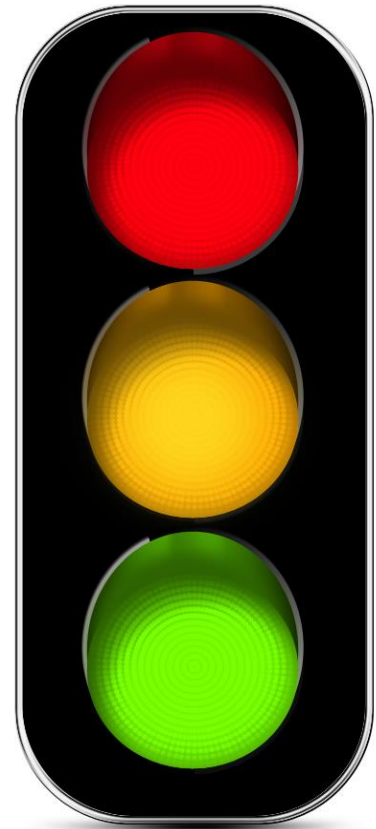
THE RISK ASSESSMENT

- The assessor will look at each of the 4 basic questions
 - **THE (BACTERIAL) SOURCE**
 - **GROWTH CONDITIONS**
 - **AEROSOL CREATION**
 - **EXPOSURE OF SUSCEPTIBLE INDIVIDUALS**
- and expand on each to get the full picture as well as ideally break the overall risk down into smaller chunks and help define control strategies
 - i.e...

CAN LEGIONELLA **GROW** WITHIN THE SYSTEM?



QUANTIFYING THE RISK



- Different assessors use different quantification means: -
 - Traffic lights
 - Need to determine in advance what **green** / **amber** / **red** might look like
 - Scoring systems
 - Need to ensure scoring is weighted / biased for more significant issues
 - Other
 - Defined by Assessor?

- There is no right or wrong

QUANTIFYING THE RISK

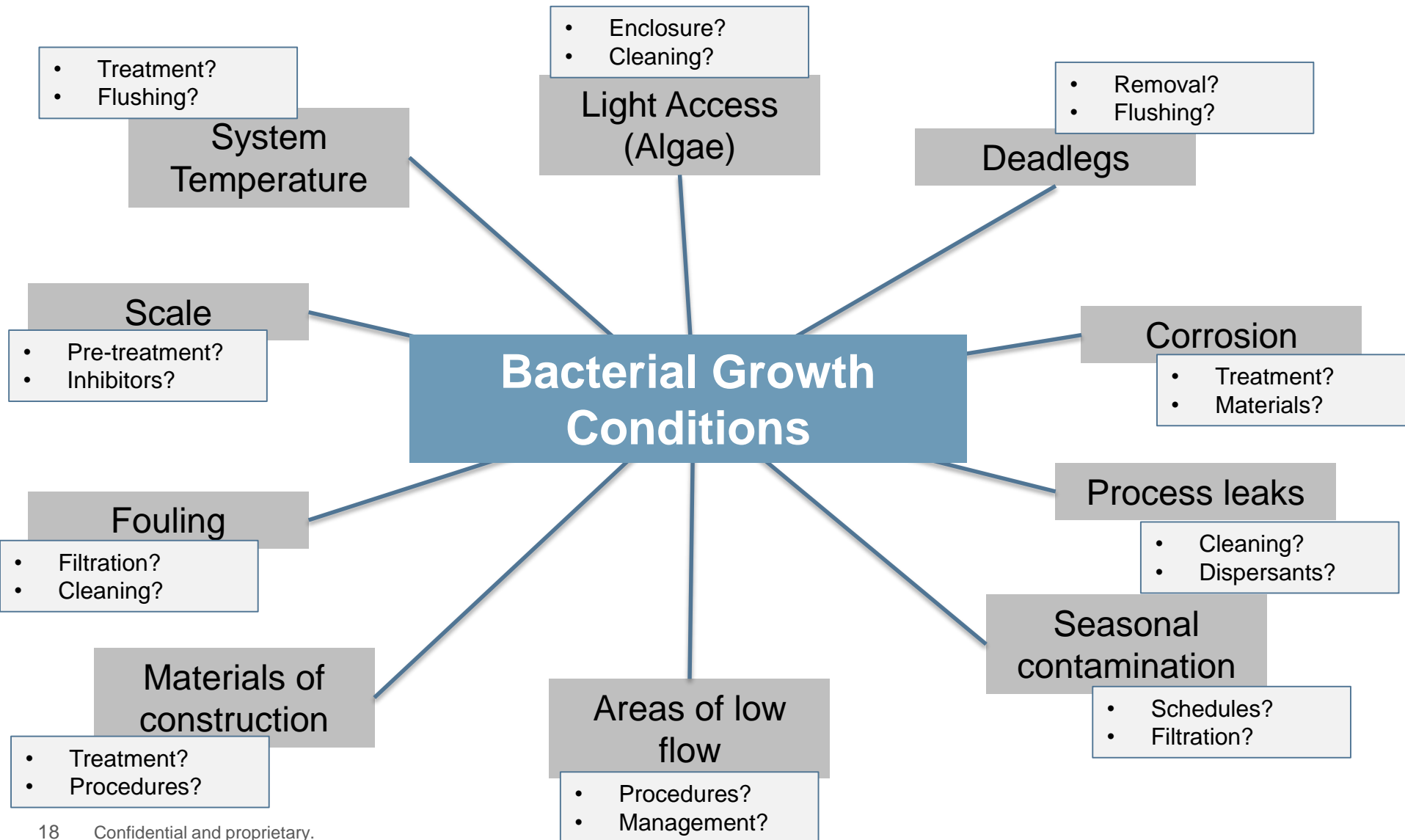
- Should allow for easy identification of where risk is coming from
 - E.g. look for the “reds”
- Can also assist with continual improvement programmes

Chain of Causation	Typical Response / Risk Implications
1. Sources of Legionella Contamination	
1.1 - Supply Water Source	Medium = Borehole / Softened
1.2 - Supply Water Treatment Programme	Low = Chlorinated mains / good quality treated borehole
1.3 - Process Leaks / Contamination	Low = Clean process / no leaks
1.4 - Local Air Quality	Medium = known consistent minor contamination source
2. Conditions for Bacterial Growth	
2.1 - System Temperatures	Low = <20oC in sump, > 45oC after H/Ex
2.2 - Light Access	Low = Entire system enclosed
2.3 - System Corrosion	High = Evidence of significant / ongoing corrosion
2.4 - System Scale	Low = Soft water supply
2.5 - Evidence of Fouling	Low = No likely sources known
2.6 - Materials of Construction	High = Wood
2.7 - Presence of Deadlegs	Low = No deadlegs or low flow areas
2.8 - Areas of Stagnation	Low = No areas of no flow / continuous circulation

RISK ASSESSMENT “RECOMMENDATIONS”

- All Risk Assessments will include a recommendations section
- Typically, in UK the recommendations will be based on HSG274 guidance
 - Nothing wrong, *per se*, although sometimes can be difficult to complete the actions
 - Don't be afraid to put in place an alternative control strategy provided it is appropriate
 - Use the RA to define the strategy.
 - E.g. if risk is elevated by a factor, can that factor be mitigated?

CAN LEGIONELLA GROW WITHIN THE SYSTEM?



THANK YOU
ANY QUESTIONS?