

# The Basics of Non-Revenue Water Reduction



## OVERVIEW

### **NEW COURSES AUTHORED BY ALLAN LAMBERT**

The Basics of Non-Revenue Water Reduction curriculum is the first in a series of three online self-paced curriculum programs, principally authored by Allan Lambert, which introduce key concepts of Non-Revenue Water to students.


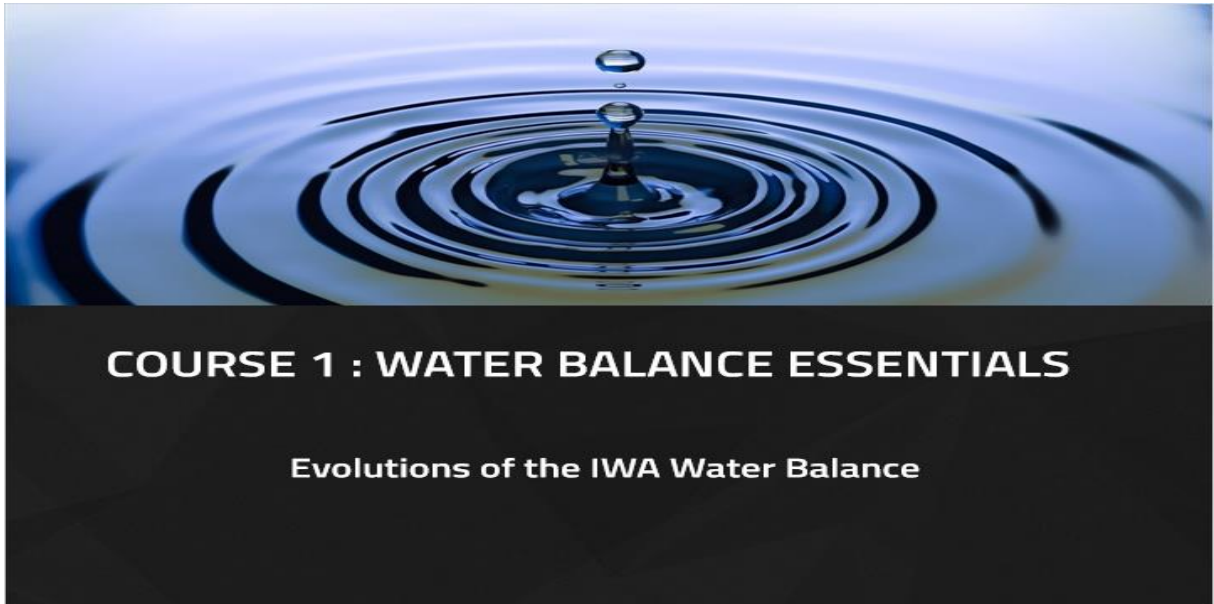
### **BUILD YOUR KNOWLEDGE OF KEY CONCEPTS**

Get up to speed on performing a water balance calculation, see how uncertainty affects your water balance calculation, and understand the importance of pressure management and correct use of performance indicators

### **LEARN AT A PACE TO SUIT YOU**

Courses are accessible online from different devices through a browser, or offline through a learning app on a tablet or mobile device. Courses can be purchased individually or in bundles, in single or multiple seats.






**COURSE 1: WATER BALANCE ESSENTIALS**

**SECTION 1**

- How did we get here?
- IWA 1st Water Loss Task Force
- IWA 2nd Water Loss Task Force
- The Five Blind Men & the Elephant
- Definition of Water Supply Inputs
- The Original Draft IWA Water Balance
- The Enhanced IWA Water Balance
- IWA Water Balance from 1st PI Report
- Apparent Losses Water Balance
- Water Balances from around the world



**1. EVOLUTION OF IWA WATER BALANCE  
1995 - 2020**

How did we get to where we are today?  
Learn more about the evolution of the IWA Water Balance

**CONTINUE**



# COURSE 1: WATER BALANCE ESSENTIALS

## SECTION 2

- System Input Volume
- Water Supplied
- Billed Metered & Unmetered Consumption
- Non-Revenue Water
- Unbilled Authorised Consumption
- Water Losses
- Unauthorised Consumption
- Customer Metering Errors
- Apparent Losses
- Real Losses



## 2. WATER BALANCE COMPONENTS

Understand the logical components of the Water Balance

CONTINUE



# COURSE 1: WATER BALANCE ESSENTIALS

## SECTION 3

- Calculate System Input Volume
- Calculate Water Supplied
- Calculate Billed Metered & Unmetered Consumption
- Calculate Non-Revenue Water
- Calculate Unbilled Authorised Consumption
- Calculate Water Losses
- Calculate Unauthorised Consumption
- Calculate Customer Metering Errors
- Calculate Apparent Losses
- Calculate Real Losses



## 3. WATER BALANCE CALCULATION

Understand the calculations of components of the Water Balance

CONTINUE





# COURSE 1: WATER BALANCE ESSENTIALS

## SECTION 4

- What happens when Real Losses are reduced?
- What happens when Apparent Losses are reduced?
- What happens when Unbilled Authorised Consumption is reduced?
- What happens when Water Exported is reduced?

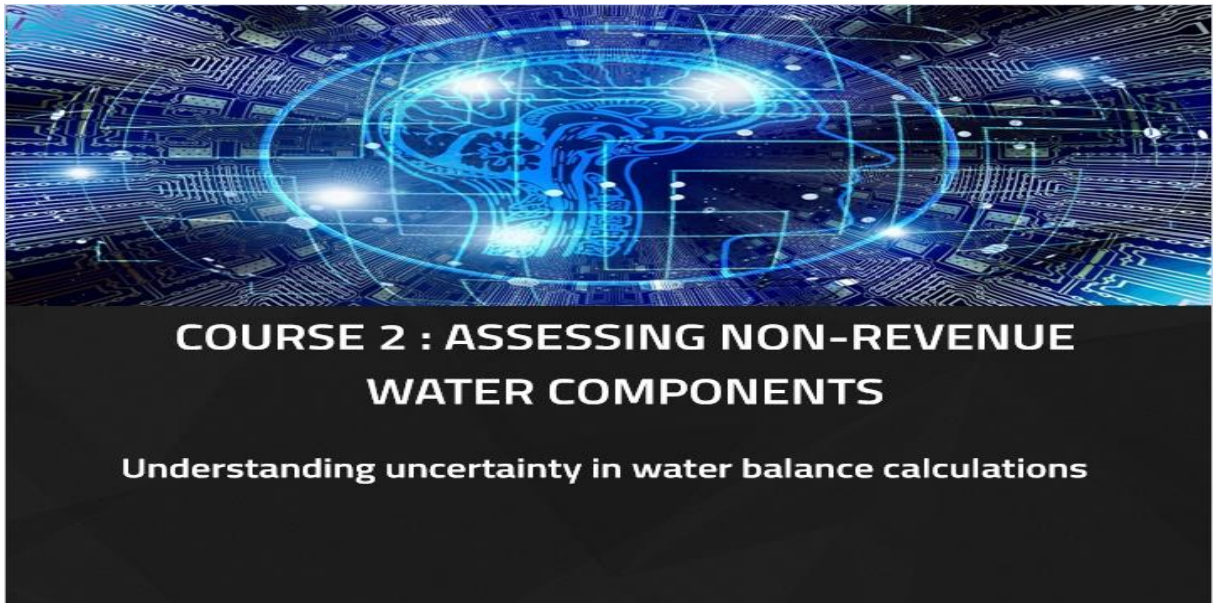


### 4. THE WATER BALANCE IN ACTION

See the effects on Water Balance components when volumes of NRW components or water exported are reduced

CONTINUE

## ***Course 2 : Assessing NRW Components***



**COURSE 2: ASSESSING NRW COMPONENTS**

**SECTION 1**

- Why bother dealing with uncertainty?
- Water Balances are an ongoing process
- Assess, Identify, Prioritise
- Use Estimated Uncertainty to Prioritise Action
- Which Components are usually a priority?
- How reliable are your results?
- Comparison of Uncertainty Calculations
  - ✓ High Income Utility with good data
  - ✓ Medium/Low Income Utility with poor data
- Which Components most influence reliability?

**SECTION 1 – DEALING WITH UNCERTAINTY IN  
WATER BALANCES**

**HOW TO ASSESS UNCERTAINTY**

**CONTINUE**

The slide features a background image of a human brain with glowing blue circuitry and neural pathways, set against a dark blue, textured background. The content is organized into a table-like structure with a blue header for the section and a dark blue footer for the next steps.





## COURSE 2: ASSESSING NRW COMPONENTS

### SECTION 2

- Guidance Notes on Apparent Losses and Water Loss Reduction Planning



#### SECTION 2 – GUIDANCE NOTES ON APPARENT LOSSES AND WATER LOSS REDUCTION PLANNING

SOURCE OF PRACTICAL INFORMATION ON QUANTIFYING WATER BALANCE COMPONENTS

[CONTINUE](#)



## COURSE 2: ASSESSING NRW COMPONENTS

### SECTION 3

- Verification of Bulk Meters
- Random Uncertainty of Bulk Meters
- Multiple Bulk Meters reduce SIV uncertainty
- What is meant by Meter Lag?
- Adjusting for Meter Lag
- Uncertainty Calculations from Bulk Metering to NRW
  - ✓ High Income/Good Data example
  - ✓ Middle/Low Income/Poor Data example



#### SECTION 3 – BULK METERING TO NRW

PRACTICAL INFORMATION TO HELP YOU

[CONTINUE](#)



## COURSE 2: ASSESSING NRW COMPONENTS

### SECTION 4

- Components of UAC and Apparent Losses
- Examples of UAC Components
- Examples of Unauthorised Consumption
- Examples of Customer Metering Errors
- Methods of Assessing Customer Metering Errors
- Correction for Customer Meter Under-registration
- Other Examples of Apparent Losses
- Using % Shortcuts for UAC and Apparent Losses
- Uncertainty Calculations from NRW to Real Losses
  - ✓ High Income/Good Data example
  - ✓ Middle/Low Income/Poor Data example



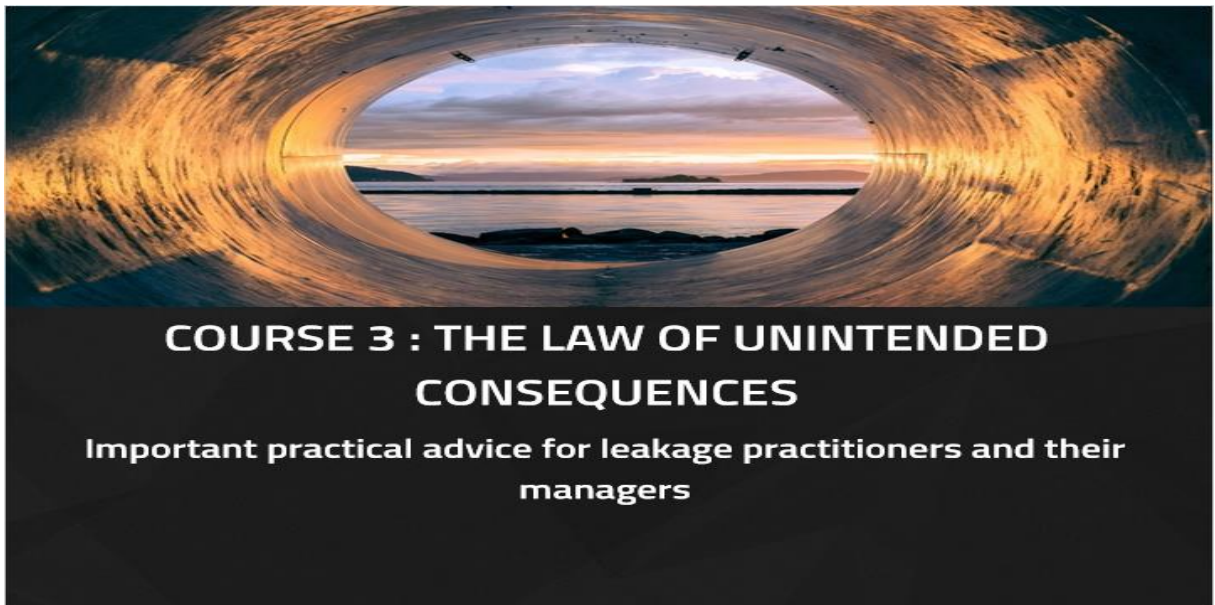
### SECTION 4 – NON-REVENUE WATER AND ITS COMPONENTS

PRACTICAL GUIDANCE TO HELP YOU SPLIT NRW

CONTINUE



## *Course 3 : The Law of Unintended Consequences*

A content area for Course 3. The top half features a blue, futuristic, circuit-like background with a glowing blue sphere in the center. The bottom half is a dark blue/black rectangle with white text and a list of topics.

**COURSE 3: THE LAW OF UNINTENDED CONSEQUENCES**

**SECTION 1**

- Multiple benefits of Pressure Management
- Flow Modulated Pressure Management
- What happens when you repair leaks?
- Improve ALC repair efficiency

A close-up image of several pressure gauges on a pipe, with a red square icon to the left.

**SECTION 1**

**WHY USE PRESSURE MANAGEMENT TO REDUCE LEAKAGE?**

**CONTINUE**





## COURSE 3: THE LAW OF UNINTENDED CONSEQUENCES

### SECTION 2

- Are most Annual Losses from mains?
- Think about where most leakage occurs
- Run time influence Annual Volume of Real Losses
- Example of Component Analysis of Real Losses
- What happens when mains are replaced but not services?



### SECTION 2

WHERE IS LEAKAGE MOST LIKELY TO OCCUR?

CONTINUE



## COURSE 3: THE LAW OF UNINTENDED CONSEQUENCES

### SECTION 3

- Choice of right KPI depends on purpose
- Which KPIs for Real Losses?
- Should %s be used to set targets and track performance for individual systems?
- Play the %s Game
- Don't use % SIV to set targets, track progress or compare leakage performance
- Professionals Abandon Percentages



### SECTION 3 : PERFORMANCE INDICATORS

WHICH PERFORMANCE INDICATORS ARE FIT FOR PURPOSE?

CONTINUE