MIKE+ TRAINING PROGRAMME for 1D/2D River Modelling

Tab. 1 Day 1 – Foundations of 1D Hydrodynamic River Modelling

Day 1 - Foundations of 1D Hydrodynamic River Modelling	
Session	***Scope***
Session 1 (1.5 h)	**Introduction & Theoretical Background** • Introduction to MIKE+ software environment • Overview of 1D hydrodynamic river modelling concepts • Governing equations and modelling assumptions • Typical applications and limitations of 1D river models

Session 2 (1.5 h) –	**Data Requirements & Model Setup**
	• Required input data for 1D river modelling
	• Spatial data overview (river geometry, cross-sections, DEM)
	• Introduction to:
	  ○ Graphical User Interface (GUI)
	  ○ Model Manager
	  ○ Databases and project structure

Session 3 (3.0 h)	**Practical Exercises: First River Model** • Creating a new river model project • Importing river geometry from SHP files • Editing river alignment • Creating cross-sections, extending cross-sections using a Digital Elevation Model (DEM) • Running a basic simulation • Review of basic model results

Outcome Day 1:
Participants can create and run a basic 1D river model in MIKE+.

Tab. 2 Day 2 - Catchment Processes, Stability & Hydraulic Structures

Day 2 - *Catchment Processes, Stability & Hydraulic Structures*	
Session	***Scope***
Session 4 (1.5 h)	**Catchment Runoff Modelling** • Overview of rainfall–runoff modelling concepts • Catchment representation in MIKE+ • Linking catchment runoff to the river model • Practical example: simple catchment setup
Session 5 (1.5 h) –	**Model Stability, Calibration & Validation** • Numerical stability of 1D river models • Common stability issues and troubleshooting • Calibration principles • Model verification and validation approaches • Practical exercises on stability improvement and calibration

Session 6 (3.0 h)	**Hydraulic Structures & Results Analysis**
	• Introduction to modelling basic hydraulic structures
	• Practical exercises:
	  ○ Weirs, culverts, gates (basic structures)
	• Tips & tricks for efficient 1D hydrodynamic modelling
	• Results inspection:
	  ○ Time series and charts
	  ○ Longitudinal profiles

Outcome Day 2:
Participants can model catchment runoff, improve model stability, and include basic hydraulic structures.

Tab. 3 Day 3 – Advanced & Integrated Modelling (1D / 1D–2D)

Day 3 – Advanced & Integrated Modelling (1D / 1D–2D)	
Session	***Scope***

Session 7 (1.5 h)	**Introduction to MIKE+ 2D Overland**
	• Modelling requirements and mathematical background
	  ○ Upstream discharge
	  ○ Downstream water level
	• Model inputs:
	  ○ 2D domain, wetting and drying, surface roughness
	• 2D boundary conditions

Session 8 (1.5 h) –	**Running Simulations & Results Analysis**
	• Configuration and execution of river simulations
	• Model stability
	• Results inspection:
	  ○ Time-varying maps of water depths, surface elevation, velocities
	  ○ Statistical results maps
	  ○ Result map animation

Session 9 (3.0 h)	**Integrated & Advanced Modelling** • Integration of river model with sewer systems (river–collector connections) • Coupling of 1D river models with flexible mesh (1D–2D): ○ Configuration principles, key settings • Advanced hydraulic structures and applications • Course summary, final discussion & evaluation

Outcome Day 3:
Participants understand integrated modelling concepts and are able to configure advanced MIKE+ river applications.

Time Schedule (can be adjusted according to customer needs)

Day 1 – Foundations of 1D Hydrodynamic River Modelling

Time	Topic
09:00 – 10:30	Session 1
10:30 – 10:45	Coffee break
10:45 – 12:15	Session 2
12:15 – 13:00	Lunch break
13:00 – 13:15	Coffee break
13:15 – 15:45	Session 3

Day 2 – Catchment Processes, Stability and Hydraulic Structures

Time	Topic
09:00 – 10:30	Session 4
10:30 – 10:45	Coffee break
10:45 – 12:15	Session 5
12:15 – 13:00	Lunch break
13:00 – 13:15	Coffee break
13:15 – 15:45	Session 6

Day 3 – Advanced and Integrated Modelling (1D / 1D–2D)

Time	Topic
09:00 – 10:30	Session 7
10:30 – 10:45	Coffee break
10:45 – 12:15	Session 8
12:15 – 13:00	Lunch break
13:00 – 13:15	Coffee break
13:15 – 15:45	Session 9