INI-files SOBEK 2

Description of the used INI-files in SOBEK 2

Technical Reference Manual

DRAFT

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INI-files SOBEK 2, Technical Reference Manual

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1 SOBEKSIM.INI

1.1 Time step estimation

for all 1D links:

$$facsum = \sum_{m=1}^{n_{links}} \left(\frac{q_m}{vl1_m Up} \right)^2 \tag{1.1}$$

$$facmax = \max \left(\frac{q_m}{vl1_m Up} \right), m = 1..n_{links} \tag{1.2}$$

For all 2d links:

$$facsum = \sum_{m=1}^{n_{links}} \left(\frac{u_m}{dx_m} \right)^2 \tag{1.3}$$

$$facmax = \max \left(\frac{u_m}{dx_m} \right), m = 1..n_{links} \tag{1.4}$$

For all links

$$facavg = \frac{facsum}{n_{links}} \tag{1.5}$$

$$dt = \max \left(dt_{min}, \frac{Cfl_{limiter}}{facmax} \right) \tag{1.6}$$

1.2 General

Keyword:	Version
Default:	PLUV2.70
Description:	

Keyword:	Language
Default:	1
Description:	

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1.3 InitialConditions

Keyword:	InitialEmptyWells
Default:	0
Description:	Switch for starting with dry system; 1 = on, 0 = off

Keyword:	InitialSalinity
Default:	0.0
Description:	

1.4 RunoffOptions

Keyword:	FixedQlatAtBranch
Default:	-1 (true)
Description:	If FixedQlatAtBranch = True then SplitQlatAtBranch = False

Keyword:	MultipleStormEvents
Default:	0 (false)
Description:	

Keyword:	SplitQlatAtBranch
Default:	0 (false)
Description:	

1.5 ResultsNodes

Keyword:	Density
Default:	0
Description:	

Keyword:	Dispersion
Default:	0
Description:	

Keyword:	Freeboard
Default:	0
Description:	

Keyword:	LateralToGW
Default:	0
Description:	

Keyword:	LateralOnNodes
Default:	0
Description:	

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Keyword:	LateralToTrench
Default:	0
Description:	

Keyword:	LevelFromStreetLevel
Default:	0
Description:	

Keyword:	RunOff
Default:	0
Description:	

Keyword:	Salinity
Default:	0
Description:	

Keyword:	TimeWaterOnStreet
Default:	0
Description:	

Keyword:	TotalArea
Default:	0
Description:	

Keyword:	TotalWidth
Default:	0
Description:	

Keyword:	Volume
Default:	0
Description:	

Keyword:	VolumeError
Default:	0
Description:	

Keyword:	VolumeInTrench
Default:	0
Description:	

Keyword:	VolumesOnStreet
Default:	0
Description:	

Keyword:	WaterDepth
Default:	0
Description:	

Keyword:	WaterLevel
Default:	-1
Description:	

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Keyword:	WaterLevelInTrench
Default:	0
Description:	

Keyword:	WaterOnStreet
Default:	0
Description:	

1.6 ResultsBranches

Keyword:	Chezy
Default:	0
Description:	

Keyword:	Discharge
Default:	-1
Description:	

Keyword:	EnergyHeadMethod
Default:	0
Description:	The energy levels are computed, when LevelsOutputOnPipes/=0 EnergyHeadMethod/10 ==1: the water level at the gridpoint is used EnergyHeadMethod/10 ==2: the water level is computed, taking the Froude number into account Mod(EnergyHeadMethod,10) == 1: the velocity in the velocity point is used Mod(EnergyHeadMethod,10) == 2: the velocity is computed by Q/A

Keyword:	Levelsoutputonpipes
Default:	0
Description:	

Keyword:	RiverSubsectionParameters
Default:	0
Description:	

Keyword:	SedimentFrijlink
Default:	0
Description:	

Keyword:	SedimentVanRijn
Default:	0
Description:	

Keyword:	Velocity
Default:	0
Description:	

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Keyword:	WaterLevelSlope
Default:	0
Description:	

Keyword:	Wind
Default:	0
Description:	

Keyword:	TWind
Default:	0
Description:	

Keyword:	FWind
Default:	0
Description:	

1.7 ResultsStructures

Keyword:	CrestLevel
Default:	0
Description:	

Keyword:	CrestWidth
Default:	0
Description:	

Keyword:	Discharge
Default:	1
Description:	

Keyword:	GateLowerEdgeLevel
Default:	0
Description:	

Keyword:	Head
Default:	0
Description:	

Keyword:	OpeningsArea
Default:	0
Description:	

Keyword:	PressureDifference
Default:	0
Description:	

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Keyword:	ThresholdForSpillCountInHours
Default:	1000
Description:	ThresholdForSpillCountInHours=12 This means that if a structure does not work for more than 12 hours, and then starts again, that you have 2 spills (and later maybe even 3 or more).

Keyword:	Velocity
Default:	0
Description:	

Keyword:	WaterLevel
Default:	0
Description:	Water levels upstream and downstream of structure

Keyword:	Waterleveloncrest
Default:	0
Description:	

1.8 ResultsPumps

Keyword:	PumpResults
Default:	0
Description:	

1.9 ResultsGeneral

Keyword:	ActualValue
Default:	-1 (true)
Description:	ActualValue, MaximumValue and MeanValue are mutual exclusive

Keyword:	DelwaqNoStaggeredGrid
Default:	0 (false)
Description:	

Keyword:	FlowAnalysisTimeSeries
Default:	0 (false)
Description:	

Keyword:	MaximumValue
Default:	0 (false)
Description:	ActualValue, MaximumValue and MeanValue are mutual exclusive

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Keyword:	MeanValue
Default:	0 (false)
Description:	ActualValue, MaximumValue and MeanValue are mutual exclusive

Keyword:	SobeksimStamp
Default:	0
Description:	

Keyword:	Zero2DRainEvap2Delwaq
Default:	0 (false)
Description:	

1.10 ResultsGrid

Keyword:	1DFlowDischargeMeasuringSection
Default:	0
Description:	

1.11 Sediment

Keyword:	DepthUsedForSediment
Default:	0.3
Description:	

Keyword:	D50
Default:	0.0005
Description:	

Keyword:	D90
Default:	0.0010
Description:	

1.12 Specials

Keyword:	DesignFactorDLG
Default:	1.0
Description:	Design Factor used in the Rational Method

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1.13 Indication

Keyword:	VelocityBranchSegments
Default:	0.5
Description:	

Keyword:	VelocityStructures
Default:	0.75
Description:	

1.14 NumericalParameters

Keyword:	AccelerationTermFactor
Default:	1.0
Description:	

Keyword:	AccurateVersusSpeed
Default:	3
Description:	Iteration criteria: 1 = Less Accurate / Fast (1.0E-6) 2 = Medium (1.0E-9) 3 = Accurate / Slow (1.0E-12)

Keyword:	CourantNumber
Default:	1
Description:	Maximum allowable Courant number Cfl_{max}.

Keyword:	DtMinimum
Default:	0.01
Description:	Minimum time step for the Courant time step estimation dt_{min} (source code: dt_pluv_min)

Keyword:	EpsilonValueVolume
Default:	0.005
Description:	Source code name $epsvol$. Accuracy factor for volumes.

Keyword:	EpsilonValueWaterDepth
Default:	0.005
Description:	Source code name $epss$. Accuracy factor for water levels.

Keyword:	FloodingDividedByDrying
Default:	2.0
Description:	

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Keyword:	Gravity
Default:	9.81
Description:	

Keyword:	MaxDegree
Default:	2
Description:	

Keyword:	MaxIterations
Default:	8
Description:	

Keyword:	MinimumSurfaceatStreet
Default:	0.1
Description:	

Keyword:	MinimumSurfaceinNode
Default:	0.1
Description:	

Keyword:	MinumumLength
Default:	1.0
Description:	

Keyword:	RelaxationFactor
Default:	1.0
Description:	

Keyword:	Rho
Default:	1000
Description:	

Keyword:	StructureInertiaDampingFactor
Default:	1.0
Description:	

Keyword:	Theta
Default:	1.0
Description:	

Keyword:	ThresholdValueDrying
Default:	0.005 (ThresholdValueFlooding/FloodingDividedByDrying)
Description:	

Keyword:	ThresholdValueFlooding
Default:	0.01
Description:	

Keyword:	ThresholdValueDryingFLS
Default:	0.0005 (ThresholdValueFloodingFLS/FloodingDividedByDrying)
Description:	

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Keyword:	ThresholdValueFloodingFLS
Default:	0.001
Description:	

Keyword:	UseTimeStepReducerStructures
Default:	0 (false)
Description:	Source code name $structimestepreducer$. When at the end of the calculation of a time step a weir or orifice is assumed to be dry ($kfu(m) == 0$), but on one side or both sides of this structure the water level is above the crest level there is a contradiction. This can be the result of an oscillation, therefore the time step is reduced and the current time step is recomputed.

1.15 SimulationOptions

Keyword:	AllowableLargerTimestep
Default:	0
Description:	In source code denoted as $largerdt$. As long as the number of iterations is less than $largerdt$ Cfl_{div} can be reduced for each time step by: $$Cfl_{div} = max(0.01, \frac{facavg}{facmax}, \sqrt{0.5} \cdot Cfl_{div}) \quad (1.7)$$ When the number of iterations exceeds $largerdt$ Cfl_{div} remains unchanged. This seems to be a bug since two lines of code is used to leave Cfl_{div} unchanged.

Keyword:	AllowableTimeStepLimiter
Default:	30
Description:	Variable $maxlimitdt$ in $limitdt$ is set to $maxlimitdt$, in subroutine SETBACK. In subroutine PLDTMX (estimation of the new time step) $limitdt$ is set to $limitdt$ -1. As long as $limitdt > 0$ a more conservative time step estimation is used: $$Cfl_{limiter} = 0.9 \cdot \frac{Cfl_{max}}{Cfl_{div}} \quad (1.8)$$

Keyword:	ASCIIFileUVComponent
Default:	1 (true)
Description:	In source code set to true anyway, so always true.

Keyword:	Cflcheckalllinks
Default:	0 (false)
Description:	

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Keyword:	Channel
Default:	1 (true)
Description:	

Keyword:	Debug
Default:	0
Description:	

Keyword:	DebugTime
Default:	0
Description:	

Keyword:	DepthsBelowBobs
Default:	0
Description:	

Keyword:	DispMaxFactor
Default:	0.45
Description:	

Keyword:	DumpInput
Default:	0
Description:	

Keyword:	Iadvec1D
Default:	1
Description:	Advection Type in 1D Flow Iadvec1D = 1: Conservation of Momentum Iadvec1D = 2: Balanced Average of Conservation of Momentum and Conservation of Energy in Contraction and Expansion Iadvec1D = 3: Balanced Average of Conservation of Momentum and Conservation of Energy in Contraction Only Iadvec1D = 4: Balanced Average of Conservation of Momentum and Conservation of Energy in Expansion Only Iadvec1D = 5: Balanced Average of Conservation of Momentum and Conservation of Energy but no Contraction and Expansion Losses

Keyword:	Limtyphu1D
Default:	1
Description:	Limiter Type for Estimating Flow Area at Velocity Point in 1D Flow Limtyphu1D = 1: Upwind Limtyphu1D = 2: Central in Cross-Sections Limtyphu1D = 3: Central in Water Levels

Keyword:	Manhloss
Default:	0
Description:	

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Keyword:	MaxAdjacentEdges
Default:	20
Description:	

Keyword:	MissingValue
Default:	-999.999
Description:	

Keyword:	Momdilution1D
Default:	1
Description:	Advection Control Volume Based upon Flow Area or Total Area in 1D Links Momdilution1D = 1: Total Area Momdilution1D = 2: Flow Area with Account for Storage Sink Term Momdilution1D = 3: Flow Area

Keyword:	OnlineCommunicationFile
Default:	”
Description:	

Keyword:	Onlineplot
Default:	0 (false)
Description:	

Keyword:	OnLineWQ
Default:	0 (false)
Description:	

Keyword:	PercentAllowableVolumeError
Default:	1
Description:	

Keyword:	PreissmannMinClosedManholes
Default:	0.001
Description:	

Keyword:	Readsamples
Default:	0 (false)
Description:	

Keyword:	River
Default:	0 (false)
Description:	

Keyword:	RTCInUse
Default:	0
Description:	

Keyword:	RunoffInUse
Default:	0
Description:	

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Keyword:	Salinity
Default:	0
Description:	

Keyword:	Sewer
Default:	0
Description:	

Keyword:	SimulationSynchron
Default:	0
Description:	

Keyword:	SiphonUpstreamThresholdSwitchOff
Default:	0.1
Description:	

Keyword:	Skipstructimestepreduction
Default:	0
Description:	Weirs and orifices can oscillate and for both structure types the flow direction can be limited to one direction only. When at the end of the iteration loop, the computed flow direction is incorrect, the time step is reduced and the current time step is recomputed. When "Skipstructimestepreduction" is set to true, this check is not performed.

Keyword:	StrucFlowDirectionAccuracyFactor
Default:	1.0
Description:	source code name $sfda\_factor$. The accuracy factor used in Skipstructimestepreduction is equal to $StrucFlowDirectionAccuracyFactor \cdot EpsilonValueWaterDepth$

Keyword:	StructureStabilityFactor
Default:	0
Description:	

Keyword:	ThresholdForSummerDike
Default:	0.4
Description:	

Keyword:	TimersOutputFrequency
Default:	1
Description:	

Keyword:	Treat2DFrictiontermsameas1D
Default:	0 (false)
Description:	

Keyword:	Use1D2DNode
Default:	-1 (true)
Description:	

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Keyword:	Use1D2DRestartInputFile
Default:	0 (false)
Description:	

Keyword:	Use1D2DRestartOutputFile
Default:	0 (false)
Description:	

Keyword:	Use2DWindFrictSameAs1DFormulation
Default:	-1 (true)
Description:	

Keyword:	UseExtraFrictionDepth1D
Default:	-1 (true)
Description:	

Keyword:	UseFls
Default:	0 (false)
Description:	

Keyword:	UseGridAsSurface
Default:	-1 (true)
Description:	

Keyword:	UseTimers
Default:	0 (false)
Description:	

Keyword:	Usevariableteta
Default:	0 (false)
Description:	

Keyword:	VolumeCheck
Default:	0 (false)
Description:	

Keyword:	Writesamples
Default:	0 (false)
Description:	

1.16 SteadyState

Keyword:	ComputeSteadyState
Default:	0 (false)
Description:	

Keyword:	Dtsteady
Default:	7200
Description:	

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Keyword:	EpsMaxU
Default:	1e-6
Description:	

Keyword:	Ntendcontrolsteady
Default:	200
Description:	

Keyword:	Ntintcontrolsteady
Default:	20
Description:	

Keyword:	Ntmaxsteady
Default:	1500
Description:	

1.17 Salinity

Keyword:	DiffusionAtBoundaries
Default:	false
Description:	

Keyword:	SaltComputation
Default:	0 (false)
Description:	

1.18 AdvancedOptions

Keyword:	CalculateDelwaqOutput
Default:	0 (false)
Description:	

Keyword:	ExtraResistanceGeneralStructure
Default:	0.0
Description:	

Keyword:	LateralLocation
Default:	1
Description:	0 = Laterals at Nearest Water Level Point 1 = Laterals at Lowest Water Level Point

Keyword:	MaxLoweringCrossAtCulvert
Default:	0.0
Description:	

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Keyword:	MaxVolFact
Default:	0.9
Description:	

Keyword:	NoNegativeQlatWhenThereIsNoWater
Default:	0
Description:	

Keyword:	TransitionHeightSD
Default:	1.0
Description:	

1.19 Overland Flow

Keyword:	2DEddyViscosity
Default:	0.0
Description:	

Keyword:	DefaultChezy1D2DConnections
Default:	1000
Description:	

Keyword:	Limtyp
Default:	1
Description:	

Keyword:	NorocoBufferFactor
Default:	2
Description:	Factor for allocating memory for irocol table, if array size to small, increase buffer

Keyword:	Noslip
Default:	0
Description:	

1.20 ResultsARCVIEW

Keyword:	FilePath
Default:	../WORK/
Description:	

Keyword:	UvelocityVvelocityResultingvelocityNoDecimalsInASCIIMapFiles
Default:	4
Description:	

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Keyword:	WaterlevelWaterdepthBedlevelNoDecimalsInASCIIMapFiles
Default:	4
Description:	

Deltares, 2016. “BIBTEX key with no entry, needed if no citations are made in the document.”

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