Annex 1

DANUBE WATERWAY DEVELOPMENT PROGRAMME

Status of water bodies according to WFD, ecological, chemical classifications

September 2020

Annex 1/a: Surface water bodies connected to the Danube according to WFD2

Water body code	Name of water body	Water management classification	Nature of water body	Description of the type	VIZIGcode	Typical recovery
AOC753	Danube between Budapest-Dunaföldvár	River	heavily modified	lowland - low gradient - calcareous - coarse sediment - Danube size	KDV	Drainage, Water supply, Navigation
AOC754	Danube between Dunaföldvár and Sió estuary	River	heavily modified	lowland - low gradient - calcareous - coarse sediment - Danube size	ADU	Drainage, Water supply, Navigation
AEP446	Danube between Gönyü-Szob	River	natural	lowland - low gradient - calcareous - coarse sediment - Danube size	ÉDU	Drainage, Water supply, Navigation
AOC755	Danube between the Sió estuary and the border	River	heavily modified	lowland - low gradient - calcareous - medium to fine sediment - Danube size	ADU	Drainage, Water supply, Navigation
AEP443	On the Danube Island	River	heavily modified	lowland - medium slope - calcareous - coarse sediment - Danube size	ÉDU	Drainage, Water supply, Navigation
AOC756	Danube between Szob and Budapest	River	natural	lowland - low gradient - calcareous - coarse sediment - Danube size	KDV	Drainage, Water supply, Navigation
AOC752	Danube-Budapest	River	heavily modified	lowland - low gradient - calcareous - coarse sediment - Danube size	KDV	Drainage, Water supply, Navigation
ANS503	Grébec-Holt-Danube	wave lagoon	natural	lowland - calcareous or organic - small, medium or large surface area - shallow or very shallow - permanent water cover	KDT	Nature
ANS512	Kamarás-Duna	wave lagoon	natural	lowland - calcareous or organic - small, medium or large surface area - shallow or very shallow - permanent water cover	ADU	Nature conservation, Fishing
AEP810	Lower Mosoni-Danube	sidebar	heavily modified	lowland - medium slope - calcareous - coarse sediment - Danube size	ÉDU	Drainage, Water supply, Navigation
AEP811	Upper Mosoni-Danube	sidebar	heavily modified	lowland - medium slope - calcareous - coarse sediment - Danube size	ÉDU	Drainage, Water supply
AEP812	Central Mosoni-Danube	sidebar	natural	lowland - medium slope - calcareous - coarse sediment - Danube size	ÉDU	Drainage, Water supply
AIH051	Bogyiszlói-Holt-Duna	Salvage side estuary	heavily modified	lowland - calcareous or organic - small, medium or large surface area - shallow or very shallow - permanent water cover	KDT	Damage control reservoir, Fishing
AIH066	Faddi-Holt-Duna	Salvage side estuary	heavily modified	lowland - calcareous or organic - small, medium or large surface area - shallow or very shallow - permanent water cover	KDT	Damage control reservoir, Recreation, Fishing
AIH081	Kadia-Ó-Duna	Salvage side estuary	heavily modified	lowland - calcareous or organic - small, medium or large surface area - shallow or very shallow - permanent water cover	ADU	Nature Protection, Water Supply, Reservoir
AIQ011	Nagybaracskai-Holt-Duna	Salvage side estuary	heavily modified	lowland - calcareous or organic - small, medium or large surface area - shallow or very shallow - permanent water cover	ADU	Nature
AIH135	Tolnai-South Holt-Duna	Salvage side estuary	heavily modified	lowland - calcareous or organic - small, medium or large surface area - shallow or very shallow - permanent water cover	KDT	Water damage control reservoir, Water supply
AIH136	Tolna-Northern-Holt-Danube	Salvage side estuary	heavily modified	lowland - calcareous or organic - small, medium or large surface area - shallow or very shallow - permanent water cover	KDT	Water damage control reservoir, Water supply, Fishing
AIQ014	Ráckeveei-Soroksári-	reservoir	heavily	lowland - calcareous or organic - small, medium or large surface	KDV	Recreation, Nature conservation,

	Dunaág		modified	area - shallow or very shallow - permanent water cover		Fishing

Annex 1/b: Detailed quality status of surface water bodies classified as river basins according to WFD2

		On the Danube Island	Danube between Gönyü-Szob	Lower Mosoni-Danube	Upper Mosoni-Danube	Central Mosoni-Danube	Danube-Budapest	Danube between Budapest-Dunaföldvár	Danube between Dunaföldvár and Sió estuary	Danube between the Sió estuary and the border	Danube between Szob and Budapest
Water body VOR code		AEP443	AEP446	AEP810	AEP811	AEP812	AOC752	AOC753	AOC754	AOC755	AOC756
Biology	Fitobentos	moderate	good	moderate	good	moderate	moderate	excellent	good	good	moderate
	Fitoplankton	excellent	excellent	excellent	good	good	moderate	moderate	moderate	good	good
	Macrophyton	-	-	-	-	good	-	-	-	-	-
	Macrozoobenton	moderate	moderate	moderate	moderate	moderate	moderate	good	moderate	moderate	moderate
	Hal	-	-	-	moderate	-	-	-	-	-	-
	Status by biological elements	**moderate**	**moderate**	**moderate**	**moderate**	**moderate**	**moderate**	**moderate**	**moderate**	**moderate**	**moderate**
Physico-chemical elements	Oxygen household	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent
	Nutrients	good	good	good	good	good	good	good	good	good	good
	Salt content	excellent	excellent	good	excellent	excellent	excellent	excellent	excellent	excellent	excellent
	Acidity	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent
	State by physico-chemical elements	**good**	**good**	**good**	**good**	**good**	**good**	**good**	**good**	**good**	**good**
Specific pollutants	**Status by metal**	**good**	**good**	**good**	**good**	**good**	**moderate**	**good**	**good**	**excellent**	**excellent**
Hydromorphological elements	Morphological status	moderate	good	moderate	good	moderate	moderate	good	moderate	good	good
	Interoperability	excellent	excellent	not assessed	not assessed	excellent	excellent	excellent	excellent	excellent	excellent
	Hydrological status	moderate	excellent	excellent	excellent	good	excellent	excellent	excellent	excellent	excellent
	Status according to hydromorphological elements	**moderate**	**good**	**moderate**	**good**	**moderate**	**moderate**	**good**	**moderate**	**good**	**good**
Ecological status		**moderate**	**moderate**	**moderate**	**moderate**	**moderate**	**moderate**	**moderate**	**moderate**	**moderate**	**moderate**
Chemical state		**good**	**good**	**good**	**good**	**good**	**good**	**good**	**good**	**good**	**good**

Annex 1/c: Quality status of surface water bodies classified as standing waters according to WFD2 in detail

		Bogyiszlói-Holt-Duna	Faddi-Holt-Duna	Kadia-Ó-Duna	Tolnai-South Holt-Duna	Tolna-Northern-Holt-Danube	Nagybaracskai-Holt-Duna	Ráckeveei-Soroksári-Dunaág	Grébec-Holt-Danube	Kamarás-Duna
Water body VOR code		AIH051	AIH066	AIH081	AIH135	AIH136	AIQ011	AIQ014	ANS503	ANS512
Biology	Fitobentos	excellent	excellent	moderate	excellent	good	good	moderate	-	-
	Fitoplankton	bad	moderate	good	-	weak	excellent	excellent	-	-
	Macrophyton	excellent	good	excellent	-	good	excellent	moderate	-	-
	Macrozoobenton	weak	weak	good	weak	weak	good	weak	-	-
	Status by biological elements	**bad**	**weak**	**moderate**	**weak**	**weak**	**good**	**weak**	**-**	**-**
Physico-chemical elements	Organic substances	weak	excellent	excellent	moderate	good	excellent	excellent	-	-
	Nutrients	good	excellent	good	excellent	excellent	good	moderate	-	-
	Salt content	excellent	good	bad	good	good	excellent	excellent	-	-
	Acidity	moderate	excellent	good	good	good	good	excellent	-	-
	State by physico-chemical elements	**weak**	**good**	**bad**	**moderate**	**good**	**good**	**moderate**	**-**	**-**
Specific pollutants	**Status by metal**	**good**	**good**	**data gap**	**good**	**good**	**data gap**	**excellent**	**data gap**	**data gap**
Hydromorphological elements	Morphological status	no data	no data	good	no data	no data	good	no data	excellent	good
	Interoperability	no data	no data	moderate	no data	no data	good	excellent	excellent	excellent
	Hydrological status	no data	no data	no data	no data	no data	no data	excellent	good	excellent
	Status according to hydromorphological elements	**not assessed**	**not assessed**	**moderate**	**not assessed**	**not assessed**	**good**	**excellent**	**good**	**good**
Ecological status		**bad**	**weak**	**moderate**	**weak**	**weak**	**good**	**weak**	-	-
Chemical state		**good**	**good**	**-**	**good**	**good**	**-**	**good**	-	-

Annex 1/d: Groundwater bodies in the study area and their main characteristics (WFD)

BEFORE	water body code	water body name	hydrodynamic type	morphological type	number of water tax totals	average roof level of the water body below ground level (m)	average thickness of the water body (m)	FAV Water body of importance for water flows	FAVÖKO exposure
AIQ548	sh.1.3	Transdanubian-Middle Mountains - Danube basin Moson-Danube - Danube estuary	Mixed	Middle Mountains	1	5	20	basic return , source	yes
AIQ544	sh.1.4	Transdanubian Mountains - Danube basin Által-ér estuary - Visegrád	Mixed	Middle Mountains	1	16	15	basic return , source	yes
AIQ546	sh.1.5	Danube Mountains - Danube water reservoir under Budapest	Mixed	Middle Mountains	1	5	25	basic return , source	yes
AIQ550	sh.1.6	Transdanubian Mountains - Danube basin Visegrád - Budapest	Mixed	Middle Mountains	1	5	30	basic return , source	yes
AIQ501	sh.1.7	Börzsöny, Gödöllő Hills - Danube water catchment	Mixed	Middle Mountains	1	17	30	basic return , source	yes
AIQ653	sp.1.1.1	Szigetköz	downstream	cone of sediment	1	3	30	base flow (Danube, Moson-Danube and tributaries), groundwater evaporation	yes
AIQ573	sp.1.1.2	Hanság, northern part of Rábca Valley	upstream	cone of sediment	1	2	30	base flow (canals), groundwater evaporation	yes
AIQ540	sp.1.10.1	Danube right bank - below Paks	downstream	hills	1	5	20	Base yield (Danube, medium watercourses)	yes
AIQ498	sp.1.10.2	Wisdom-Bogyisloi Bay	upstream	Price range	1	3	20	base flow (Danube), wetland nourishment, groundwater evaporation	yes
AIQ589	sp.1.11.1	Karasica water collector	Mixed	hills	1	15	10	base flow (medium water courses), groundwater evaporation	yes
AIQ651	sp.1.11.2	Szekszárd-Bátai and Kölkedi estuaries	upstream	cone of sediment	1	10	8	base flow (Danube), wetland nourishment, groundwater evaporation	yes
AIQ583	sp.1.12.2	Ipe Valley	upstream	cone of sediment	1	5	7	base flow (Ipoly), wetland nourishment, groundwater evaporation	yes
AIQ536	sp.1.13.1	Left bank of the Danube - Vác-Budapest	downstream	hills	1	9	30	Base yield (Danube and medium watercourses)	yes
AIQ652	sp.1.13.2	Szentendrei Island and other islands in the Danube	upstream	cone of sediment	1	4	19	basic yield (Danube)	yes
AIQ525	sp.1.14.2	Danube-Tisza basin - Northern part of the Danube Valley	upstream	cone of sediment	1	3	20	base flow (Danube, canals), wetland nourishment, groundwater evaporation	yes
AIQ529	sp.1.15.1	Danube-Tisza hinterland - Southern part of the Danube water catchment	downstream	back	1	5	23	wetland nourishment, groundwater evaporation	yes
AIQ522	sp.1.15.2	Danube-Tisza basin - Southern Danube Valley	upstream	cone of sediment	1	3	25	base flow (Danube, canals), wetland nourishment, groundwater evaporation	yes
AIQ560	sp.1.4.1	The northern periphery of the Transdanubian Central Mountains	Mixed	mountain tops	1	12	30	Base yield (medium watercourses)	yes
AIQ562	sp.1.4.2	Northern rim of the Transdanubian	upstream	cone of	1	5	30	base flow (Danube), wetland	yes

Annex 1/d: Groundwater bodies in the study area and their main characteristics (WFD)

		Central Mountains alluvial terrace		sediment				nourishment, groundwater evaporation	
AIQ537	sp.1.9.1	Danube right bank - Budapest-Paks	downstream	hills	1	5	7	Base yield (Danube, medium watercourses)	yes

Annex 1/e: Groundwater bodies and quantitative characteristics of the study area (WFD2)

Water body code	Name of water body	Sinking test	Water balance test	Surface water test	Status of wetland and terrestrial ecosystems	Aggregated rating
sh.1.3	Transdanubian-Middle Mountains - Danube basin Moson-Danube - Danube estuary	good	good	good	good	**good**
sh.1.4	Transdanubian Mountains - Danube basin Által-ér estuary - Visegrád	good	good but low risk	good	good	**good but low risk**
sh.1.5	Danube Mountains - Danube water reservoir under Budapest	good	good but low risk	good	good	**good but low risk**
sh.1.6	Transdanubian Mountains - Danube basin Visegrád - Budapest	good	good but low risk	good	good	**good but low risk**
sh.1.7	Börzsöny, Gödöllő Hills - Danube water catchment	good	good	good	good	**good**
sp.1.1.1	Szigetköz	good	good	good	good	**good**
sp.1.1.2	Hanság, northern part of Rábca Valley	good	good	good	weak	**weak**
sp.1.10.1	Danube right bank - below Paks	good	good but low risk	good	good	**good but low risk**
sp.1.10.2	Wisdom-Bogyisloi Bay	good	good but low risk	good	good	**good but low risk**
sp.1.11.1	Karasica water collector	good	good	good	good	**good**
sp.1.11.2	Szekszárd-Bátai and Kölkedi estuaries	good	good	good	good	**good**
sp.1.12.2	Ipe Valley	good	good	good	good	**good**
sp.1.13.1	Left bank of the Danube - Vác-Budapest	good	good but low risk	good	good	**good but low risk**
sp.1.13.2	Szentendrei Island and other islands in the Danube	good	good but low risk	good	good	**good but low risk**
sp.1.14.2	Danube-Tisza basin - Northern part of the Danube Valley	good	weak	-	good	**weak**
sp.1.15.1	Danube-Tisza hinterland - Southern part of the Danube water catchment	good	good	good	weak	**weak**
sp.1.15.2	Danube-Tisza basin - Southern Danube Valley	good	weak	good	good	**weak**
sp.1.4.1	The northern periphery of the Transdanubian Central Mountains	good	good	good	good	**good**
sp.1.4.2	Northern rim of the Transdanubian Central Mountains alluvial terrace	good	weak	good	good	**weak**
sp.1.9.1	Danube right bank - Budapest-Paks	good	good but low risk	good	good	**good but low risk**

Annex 1/f: Groundwater bodies and their chemical status in the study area (WFD2)

Water body code	Name of water body	Diffuse pollution (nitrate, ammonium) in the water body (>20%)	Contaminated Drinking Water Source Protection Area	Aggregated trend water body classification (good, poor, risky)	Surface water status	Status of groundwater-dependent wetlands and terrestrial ecosystems	Overall rating
			Component				
sh.1.3	Transdanubian-Middle Mountains - Danube basin Moson-Danube - Danube estuary	good	good but low risk (NO3-)	good	good	-	**good but low risk**
sh.1.4	Transdanubian Mountains - Danube basin Által-ér estuary - Visegrád	good	good	weak	weak	-	**weak**
sh.1.5	Danube Mountains - Danube water reservoir under Budapest	good	good	good	good	-	**good**
sh.1.6	Transdanubian Mountains - Danube basin Visegrád - Budapest	good	weak (NO3-)	good	good	-	**weak**
sh.1.7	Börzsöny, Gödöllő Hills - Danube water catchment	good	good	good	good	-	**good**
sp.1.1.1	Szigetköz	good	good	good	good	good	**good**
sp.1.1.2	Hanság, northern part of Rábca Valley	good	good	good	good	-	**good**
sp.1.10.1	Danube right bank - below Paks	good but low risk	good	good	good	-	**good but low risk**
sp.1.10.2	Wisdom-Bogyisloi Bay	good	good but low risk (NH_4^+, SO_4^{2-})	good	good	-	**good but low risk**
sp.1.11.1	Karasica water collector	good	good	good	good	-	**good**
sp.1.11.2	Szekszárd-Bátai and Kölkedi estuaries	good	weak (NH4+)	good	good	-	**weak**
sp.1.12.2	Ipe Valley	good	good	good but low risk	good	-	**good but low risk**
sp.1.13.1	Left bank of the Danube - Vác-Budapest	weak (NO3-)	weak (NO3-, NH_4^+, SO_4^{2-}, atrazine)	good but low risk	weak	-	**weak**
sp.1.13.2	Szentendrei Island and other islands in the Danube	good	weak (NO3-)	good	good	-	**weak**
sp.1.14.2	Danube-Tisza basin - Northern part of the Danube Valley	good	weak (NO3-, SO42-)	good but low risk	good	good	**weak**
sp.1.15.1	Danube-Tisza hinterland - Southern part of the Danube water catchment	weak (NO3-)	good	good	good	-	**weak**
sp.1.15.2	Danube-Tisza basin - Southern Danube Valley	good	good	good	good	-	**good**
sp.1.4.1	The northern periphery of the Transdanubian Central Mountains	good	good	good	weak	-	**weak**
sp.1.4.2	Northern rim of the Transdanubian Central Mountains alluvial terrace	good	good	good	weak	-	**weak**
sp.1.9.1	Danube right bank - Budapest-Paks	weak (NO3-)	weak (NO3-)	good	good	-	**weak**

Annex 1/g: Water abstraction from water bodies (WFD2)

Water body code	Water body name	Drinking water	Industry	Energy	Mining	Agricultural irrigation	Other agricultural	Bathing, recreation	Other	Total
		m3/day	m3/day	m3/day	m3/day	m3/day	m3/day	m3/day	m3/day	m3/day
sh.1.3	Transdanubian-Middle Mountains - Danube basin Moson-Danube - Danube estuary	76	7			89	202		84	**458**
sh.1.4	Transdanubian Mountains - Danube basin Által-ér estuary - Visegrád	46	1 103				116		9	**1 274**
sh.1.5	Danube Mountains - Danube water reservoir under Budapest		358			147	69		22	**596**
sh.1.6	Transdanubian Mountains - Danube basin Visegrád - Budapest	5182	258			41		30	63	**5574**
sh.1.7	Börzsöny, Gödöllő Hills - Danube water catchment	3 292	5			5	58			**3 360**
sp.1.1.1	Szigetköz	22	783			617	216	1 115	373	**3 125**
sp.1.1.2	Hanság, northern part of Rábca Valley	10 064	159	12		2 459	400	222	318	**13 633**
sp.1.10.1	Danube right bank - below Paks	36	11			65	66		4	**182**
sp.1.10.2	Wisdom-Bogyisloi Bay	2 704	3			45	58		194	**3 003**
sp.1.11.1	Karasica water collector	308	64				627		110	**1 109**
sp.1.11.2	Szekszárd-Bátai and Kölkedi estuaries	9 081	19				102		1 501	**10 703**
sp.1.12.2	Ipe Valley	2 812	55			45			44	**2 956**
sp.1.13.1	Left bank of the Danube - Vác-Budapest	14 573	559	755		1 093	56	179	1 334	**18 548**
sp.1.13.2	Szentendrei Island and other islands in the Danube	34 181				1	1	36	5	**34 223**
sp.1.14.2	Danube-Tisza basin - Northern part of the Danube Valley	17 110	376	3		710	367		41	**18 607**
sp.1.15.1	Danube-Tisza hinterland - Southern part of the Danube water catchment	60	52			801	62		15	**991**
sp.1.15.2	Danube-Tisza basin - Southern Danube Valley	2 979	506		3	580	333		48	**4 448**
sp.1.4.1	The northern periphery of the Transdanubian Central Mountains	1	42			153	150		219	**564**
sp.1.4.2	Northern rim of the Transdanubian Central Mountains alluvial terrace	3 797	1 077			210	10	108	361	**5 562**
sp.1.9.1	Danube right bank - Budapest-Paks	7 481	3 386			105	40		102	**11 114**

Annex 1/h: Major water abstractions from water bodies by group of sites (WFD2)

Water body code	Object group name	Water type	EIA obligatory water abstraction volume according to the provisions of Government Decree 314/2005 (XII. 25.) on groundwater abstraction	Average water abstraction of a group of sites between 2008 and 2013 (thousand $^{m3/year}$)	Object group water abstraction classification
sh.1.4	Nyergesújfalu Eternitgyár CEMBRIT Kft	groundwater	>1000 m3/day (365 thousand m3/year)	370	important
sh.1.6	Budapest shore filtered aquifers Public water supply Bp. 03. ker. Budaújlak	Coastal filtration	>5000 m3/day (1825 thousand m3/year)	2 472	important
sp.1.13.2	Budapest Shore-filtered aquifers Public utilities Bp. District 13. Margaret Island	Coastal filtration	>5000 m3/day (1825 thousand m3/year)	3 950	important
sh.1.6	Village waterworks	Coastal filtration	>5000 m3/day (1825 thousand m3/year)	2 709	important
sh.1.7	Verőcemarosi aquifer	Coastal filtration	>5 million m3/year	6 633	Significant
sh.1.6	Szentendre Reg.D.Vizb.	Coastal filtration	>5000 m3/day (1825 thousand m3/year)	2 551	important
sp.1.13.1	Dunakeszi Waterworks	groundwater	>1000 m3/day (365 thousand m3/year)	563	important
sp.1.13.1	Dunakeszi Balpart	Coastal filtration	>5 million m3/year	8 402	Significant
sp.1.13.2	Budapest coastal filtered aquifers Northern system	coastal filtration / groundwater	>5 million m3/year	127 177	Significant
sp.1.14.2	Budapest coastal filtered aquifers South system	Coastal filtration	>5 million m3/year	46 236	Significant
sp.1.1.1	Mosonmagyaróvár FLEXUM (cold water)	groundwater	>1000 m3/day (365 thousand m3/year)	407	important
sp.1.1.2	Győr Révfalu	Coastal filtration	>5 million m3/year	6 396	Significant
sp.1.10.2	Tolna	groundwater	>1000 m3/day (365 thousand m3/year)	689	important
sp.1.11.2	Szekszárd vm.	groundwater	>1000 m3/day (365 thousand m3/year)	2 961	important
sp.1.11.2	Szekszárd decontamination	groundwater	>1000 m3/day (365 thousand m3/year)	562	important
sp.1.12.2	Dejtár NYNRV Squirrel right bank	Coastal filtration	>5000 m3/day (1825 thousand m3/year)	1 878	important
sp.1.15.2	Baja Vm	Coastal filtration	>5000 m3/day (1825 thousand m3/year)	2 230	important
sp.1.15.2	Foktői reg.vm. Baraka	Coastal filtration	>5000 m3/day (1825 thousand m3/year)	1 971	important
sp.1.15.2	Mohács PMRV	Coastal	>5000 m3/day (1825 thousand m3/year)	2 594	important

		filtration			
sp.1.9.1	BP.22.District BUSZESZ	Coastal filtration	>5 million m3/year	6 201	Significant
sp.1.9.1	Dunaújváros	Coastal filtration	>5000 m3/day (1825 thousand m3/year)	3 444	important
sp.1.9.1	Ercsi waterworks	Coastal filtration	>5 million m3/year	5 739	Significant

Annex 1/i: Baseline and vulnerability data for aquifers (WFD2)

Name of the aquifer	Risk of contamination of the aquifer	Aquifer geological medium at risk-dangerousness	Climate vulnerability		Risk exposure from surface water pollution	Total risk of vulnerability of the aquifer	Status	Production to be protected (m^3/day)	Protected area boundaries (fkm)
			Quantitative	Water quality					
Nagybajcs-Ny	none	Significant	Medium	Medium	Significant	Significant	remote	40 000	1802-1808
Nagybajcs-K	none	Significant	Medium	Medium	Significant	Significant	remote	25 000	1796-1802
Győr VR Szőnyei tp	none	Significant	Medium	Medium	Significant	Significant	Operating	25 000	1796-1802
Old people	none	Medium	Significant	Significant	none	Significant	remote	30 000	1795-1797,5
Ácsi bay - Horse meadow	none	Significant	Medium	Medium	Significant	Significant	remote	40 000	1778-1782
Komárom-Koppánymonostor	none	Significant	Medium	Medium	Significant	Significant	Operating	5 000	1771,92-1775,13
Dunaalmás-Neszmély waterworks	none	Significant	Significant	Significant	Significant	Significant	Operating	500	-
Viscose factory (ZOLTEK)	none	Significant	Medium	Medium	Significant	Significant	Operating	2 740	-
Tathic islands	none	Significant	Medium	Medium	Significant	Significant	remote	10 000	1728-1731
Tatti waterworks	none	Significant	Medium	Medium	Significant	Significant	Operating	3 000	1725,8-1729,6
Esztergom, Prímás Island	none	Significant	Medium	Medium	Significant	Significant	Operating	12 000	1720-1722
Esztergom-K-Pilismarót	none	Significant	Medium	Medium	Significant	Significant	remote	10 000	1700-1705
Zebegény Municipal Waterworks water base	none	Significant	Medium	Medium	Significant	Significant	Operating	411	1704,3 - 1704
Dömös aquifer	none	Significant	Medium	Medium	Significant	Significant	Operating	2 332	1702 - 1700
Visegrad, DJRVR Visegrad Aquifer	none	Significant	Medium	Medium	Significant	Significant	Operating	615	1695-1694,7
Nagymaros, DBRVR Nagymarosi aquifer	none	Significant	Medium	Medium	Significant	Significant	Operating	7 400	1692,4-1690,5
Kismaros-Nagymaros Távlati Vízbázis	none	Significant	Medium	Medium	Significant	Significant	remote	15 000	1692,3 - 1688,7
Verőcemaros, DBRVR Verőcei aquifer	none	Significant	Medium	Medium	Significant	Significant	Operating	20 000	1687,6 - 1685,3
Kisoroszi vmt.	none	Significant	Medium	Medium	Significant	Significant	Operating	130 000	1692 - 1683,7
Tahitótfalu, Tótfalui waterworks	none	Significant	Medium	Medium	Significant	Significant	Operating	18 000	1683,7 - 1680
Vác, DBRVR Vác Buki-szigeti aquifer	none	Significant	Medium	Medium	Significant	Significant	Operating	6 250	1683 - 1681,3
Pócsmegyer, Surányi vmt.	NO3-	Significant	Medium	Medium	Significant	detected pollution	Operating	105 000	1680 -1671
Szigetmonostor, Pócsmegyeri vmt.	NO3-	Significant	Medium	Medium	Significant	detected pollution	Operating	103 000	1675 - 1666
Szigetmonostor, Horányi vmt.	none	Significant	Medium	Medium	Significant	Significant	Operating	36 000	1671 - 1664
Dunakeszi, DBRVR Dunakeszi aquifer	NO3-	Significant	Medium	Medium	Significant	detected pollution	Operating	4 200	1664,9 - 1663,9
Dunakeszi, Balparti II. Vmt.	none	Significant	Significant	Significant	Significant	Significant	Operating	45 000	1663,85 - 1660,6

Name of the aquifer	Risk of contamination of the aquifer	Aquifer geological medium at risk-dangerousness	Climate vulnerability		Risk exposure from surface water pollution	Total risk of vulnerability of the aquifer	Status	Production to be protected (m^3/day)	Protected area boundaries (fkm)
			Quantitative	Water quality					
Dunakeszi, DBRVR Dunakeszi aquifer	none	Significant	Significant	Significant	Significant	Significant	Operating	4 200	1660,6- 1658,5
Szigetmonostor, Sziget I-II. vmt.	none	Significant	Medium	Medium	Significant	Significant	Operating	88 000	1664 - 1657,2
Budapest III., Budaújlaki vmt.	none	Significant	Medium	Medium	Significant	Significant	Operating	22 000	1653 - 1649,8
Budapest XIII., Margitszigeti vmt.	none	Significant	Medium	Medium	Significant	Significant	Operating	44 000	1651,8 - 1648,7
Halásztelek, Csepel-Halásztelek vm.	NO3-, SO24-, metals, TPH, VOC, PAH	Significant	Medium	Medium	Significant	detected pollution	Operating	90 000	1637,1 - 1624,1
Érd, Dunaparti aquifer	none	Significant	Medium	Medium	Significant	Significant	Operating	3 800	1630 - 1626,7
Szigetújfalu, Tököl-Szigetújfalu vm.	NO3-	Significant	Medium	Medium	Significant	detected pollution	Operating	69 000	1621,6 - 1612
Ráckeve I. Vmt.	none	Significant	Medium	Medium	Significant	Significant	Operating	95 000	1610,9 - 1600,8
Ráckeve II.	none	Significant	Medium	Medium	Significant	Significant	Operating	4 000	1610,9 - 1600,8
Lórév-Makád Remote Aquifer	none	Significant	Medium	Medium	Significant	Significant	remote	28 000	1598,7 - 1591
Tass Waterworks	none	none	none	none	none	none	Reserve	n.a.	1583,7 - 1585,7
Dunavecse-Season	none	Significant	Medium	Medium	Significant	Significant	remote	30 000	1579 - 1573
Apostag-Dunaegyháza	none	Significant	Medium	Medium	Significant	Significant	remote	16 000	1563,7 - 1569,2
Solti Island	none	Significant	Medium	Medium	Significant	Significant	remote	8 000	1562,7-1563,5
Charter- Solt	none	Significant	Medium	Medium	Significant	Significant	remote	74 000	1557,2 - 1546,3
Bölcske remote water source	none	Significant	Medium	Medium	Significant	Significant	remote	35 000	1552 - 1547
Madocsa remote water supply	none	Significant	Medium	Medium	Significant	Significant	remote	35 000	1544 - 1539,2
Ordas-Dunapataj	none	Significant	Medium	Medium	Significant	Significant	remote	43 000	1541,5 - 1532,3
Foktő-Baráka	none	Significant	Medium	Medium	Significant	Significant	Operating	16 500	1523,4 - 1520,3
Gerjen-E long-distance aquifer	none	Significant	Medium	Medium	Significant	Significant	remote	32 000	1521,6 - 1517
Bátya-Northern aquifer	none	Significant	Medium	Medium	Significant	Significant	remote	27 000	1516 - 1513,1
Gerjen-Dombori long-distance aquifer	none	Significant	Medium	Medium	Significant	Significant	remote	40 000	1514 - 1507,3
Szekszárd Shooting range world championship.	NH4+	Medium	Significant	Medium	none	polluted producer wells	Operating	7 000	1506,4 - 1505,5
Fadd-Dombori-Bogyiszló long-distance championship.	none	Significant	Medium	Medium	Significant	Significant	remote	12 000	1504,3 - 1502,7
Fajsz-Dusnok	none	Significant	Medium	Medium	Significant	Significant	remote	45 000	-
Sükösd North	none	Significant	Medium	Medium	Significant	Significant	remote	30 000	-
Baja Psz Waterworks	none	Significant	Medium	Medium	Significant	Significant	Operating	20 000	-

Name of the aquifer	Risk of contamination of the aquifer	Aquifer geological medium at risk-dangerousness	Climate vulnerability		Risk exposure from surface water pollution	Total risk of vulnerability of the aquifer	Status	Production to be protected (m^3/day)	Protected area boundaries (fkm)
			Quantitative	Water quality					
Báta remote water source	none	Significant	Medium	Medium	Significant	Significant	remote	12 000	1468 - 1465,2
Dunafalva Leneskert	none	Significant	Medium	Medium	Significant	Significant	remote	30 000	1462,8-1465
Dunafalva Bezeredi Island	none	Significant	Medium	Medium	Significant	Significant	remote	30 000	-
Mohács PMRV (regional)	none	Significant	Medium	Medium	Significant	Significant	Operating	33 000	1457 - 1447,5
Újmohács D.	none	Significant	Medium	Medium	Significant	Significant	remote	20 000	1446,3 - 1442

Annex 2

DANUBE WATERWAY DEVELOPMENT PROGRAMME

Shipping and maritime legislation in force

September 2020

Shipping and maritime legislation in force

Regulation number	Regulation number Title
Regulation (EU) No 1315/2013 of the European Parliament and of the Council (11.XX.2013)	on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU
Act XLII of 2000	on waterborne transport
Act LXV of 2003	promulgating the consolidated text of the 1966 International Convention on Load Lines and the 1988 Protocol relating thereto
Decree-Law No 28 of 1973	on the proclamation of the Convention for the Unification of Certain Rules relating to Liability in Collisions with Inland Navigation Vessels, signed at Geneva on 15 March 1960
Decree-Law No 19 of 1978	on the proclamation of the Convention on the Coordination of Inland Navigation Vessels, done at Geneva on 15 February 1966
Government Decree 237/2002 (8.XI.)	on the functions, powers and jurisdiction of maritime administrations
Government Decree 139/1992 (X. 15.)	on the proclamation of the Hungarian-Dutch Inland Navigation Convention
168/1992 (XII. 22.) Government Decree	on the proclamation of the Hungarian-German Inland Navigation Convention
Government Decree 72/1996 (V. 22.)	on the exercise of water management authority
Government Decree 151/2000 (IX. 1.)	on the conclusion of the European Agreement on Waterways of International Importance
Government Decree 198/2000 (XI. 29.)	on the registration of floating installations
Government Decree 30/2003 (III. 18.)	on the restriction of waterborne transport on certain inland waterways for environmental reasons and on the authorisation to operate in restricted areas
Government Decree 225/2003 (XII. 13.)	on the safety inspection of seagoing vessels flying the flag of a foreign state on Hungarian waterways
Joint Decree 21/2002 (XI. 8.) GKM-ESzCsM	on the conditions and arrangements for medical fitness for navigation
28/2000 (XII. 18.) KöViM Decree	on the arrangements for authorising shipping activities
Decree No 15/2001 (IV. 27.) of the Ministry of Finance	on maritime qualifications
MT Decree 56/1982 (X. 22.)	on the proclamation of the International Convention on Tonnage Measurement of Ships, 1969
13/1996 (VI. 28.) BM Decree	on police administration of waterborne transport
Decree No 46/2001 (XII.27.) of the Ministry of the Interior	46/2001 (XII.27.) BM Decree on the basic rules of staying on the open water
Decree 25/2008 (IX. 23.) of the Council of Ministers	on the detailed rules for the imposition of fines and the arrangements for their use
Decree No 13/2001 (IV. 10.) of the Ministry of Finance	on the conditions for the suitability and conformity for navigation, the inspection and certification of the serviceability of inland waterway installations
Decree 16/2008 (30.VII.) NFGM	on safety requirements and certification of conformity of machinery
Decree 29/2001 (IX. 1.) of the Ministry of Finance	on the fees to be charged for the procedures of the maritime administrations
Decree No 34/2001 (X. 12.) of the Ministry of Finance	on the proclamation of the Annexes to the International Convention for the Prevention of Pollution from Ships, 1973, and

Regulation number	Regulation number Title
	the Protocol of 1978 relating thereto (MARPOL 1973/1978), promulgated by Law X of 2001
Decree No 17/2002 (III. 7.) of the Ministry of Finance	declaring natural and artificial surface waters suitable for navigation or capable of being made suitable for navigation
GKM Decree 26/2002 (XI. 29.)	about the seafarer's and sailor's service book
GKM Decree No 27/2002 (XII. 5.)	on navigation and way-finding signs and on the establishment, operation, alteration and removal of such signs
GKM Decree 49/2002 (XII. 28.)	the general rules for the operation of ports, ferry and pilotage facilities and other navigational facilities and the application of the codes of practice
1/2004 (I. 5.) GKM Decree	on the safe loading of bulk carriers
GKM Decree 2/2004 (I. 5.)	on the recognition, designation and authorisation of organisations for the inspection, verification and certification of the conformity of floating installations
Government Decree 225/2003 (XII. 13.)	on the safety inspection of seagoing vessels flying the flag of a foreign state on Hungarian waterways
Government Decree 261/2008 (XI. 3.)	on the conditions of carriage of passengers by waterway
GKM Decree 29/2003 (V. 8.)	on the detailed rules for the operation of the Inland Waterways Fund Programme
Decree 58/2012 (X. 31.) NFM	the body designated to carry out research, development and coordination tasks in the field of road safety and environmental protection
Government Decree 219/2007 (VIII. 15.)	on River Information Services
Decree 45/2011 (VIII. 25.) NFM	the professional and operational rules for River Information Services
382/2016 (XII. 2.) Government Decree	designating the bodies responsible for carrying out the tasks of the public authorities in the field of transport administration
Government Decree 147/2010 (IV. 29.)	general rules on activities and installations for the exploitation, protection and remedying of damage to waters
Government Decree 223/2014 (IX. 4.)	on the designation of bodies responsible for water management and for water management and protection

Annex 3

DANUBE WATERWAY DEVELOPMENT PROGRAMME

Water Framework Directive (WFD) Measures to improve the good ecological status/ecological potential of Danube water bodies

September 2020

A WFD2 Measures to improve the good ecological status/ecological potential of Danube water bodies under WFD2

Measures			Name of water body						
Categories	Number	Name	On the Danube Island	Danube between Gönyű-Szob	Danube-Budapest	Danube between Budapest-Dunaföldvár	Danube between Dunaföldvár and Sió estuary	Danube between the Sió estuary and the border	Danube between Szob and Budapest
Urban waste water	1.1	Implementation of the Wastewater Programme. Establishment of new wastewater treatment plants, modernisation of existing wastewater treatment plants (capacity increase, technology development, reconstruction), in compliance with the limits for surface water intake.	-	yes	yes	yes	yes	yes	yes
	1.3	An alternative method of disposal of treated effluent (e.g. disposal of treated effluent in an open pit, transfer to another receiving body), without compromising the good status of the receiving groundwater or surface water body.	-	yes	-	-	-	-	-
	1.4	Increasing the sludge storage capacity of the wastewater treatment plant, improving treatment technology	-	-	yes	-	-	-	-
Diffuse load	2.1	General set of rules to reduce nutrient pollution in agricultural production, effective limitation of nutrient application in arable and plantation areas	yes	yes	yes	yes	yes	yes	yes
	29.2	Upgrading of livestock farms under the EU Nitrates Directive	yes	yes	yes	yes	yes	yes	yes
	17.1	Reducing run-off of pollutants and sediments by grassing, afforestation, terracing on slopes, infiltration surfaces, isolation of inland crops		yes	yes	yes	yes	yes	yes
	17.9	Reducing erosion and run-off in forest areas by applying good forest management practices (closed canopy or undergrowth, no cutting, designation of forest roads)	-	yes	-	-	-	-	-
Thermal water (heat, salt)	14.2	Development and operation of monitoring systems and information systems	-	-	yes	-	-	-	-
	27.2	Treatment of thermal waters used for bathing and spa treatment	-	-	-	yes	-	-	-
,Measures to reduce regulation and its ecological impact	6.2	Establishing appropriate vegetation in the surf zone	yes	yes	yes	yes	-	yes	yes
	6.3a	One-off removal of accumulated silt and in-stream vegetation in watercourses and standing waters	yes	yes	yes	-	yes	-	yes
	6.3b	Restructuring the shape and contours of the riverbed to approximate the natural state, while meeting recognised human needs	yes	-	-	-	-	-	-
	6.4	Water type-dependent zonation rehabilitation in riparian zones of watercourses and standing waters	-	yes	-	-	-	-	-

Measures			Name of water body						
Categories	Number	Name	On the Danube Island	Danube between Gönyű-Szob	Danube-Budapest	Danube between Budapest-Dunaföldvár	Danube between Dunaföldvár and Sió estuary	Danube between the Sió estuary and the border	Danube between Szob and Budapest
	6.5	Gradually achieving and maintaining the good ecological status and potential of watercourses and standing waters through maintenance works	yes	yes	yes	yes	yes	yes	yes
	6.6	Demolition of in-stream facilities that have lost their function, and progressive achievement of good ecological status and potential of the environment	yes	yes	yes	yes	yes	yes	yes
	6.7	Restrictions on dredging and disposal of dredged material that increases the size of the bed, with particular attention to ecological and river basin protection	yes	-	-				
	6.8	Improving the water availability of the floodplain and floodplain	yes	yes	-	yes	yes	yes	yes
	6.9	Reducing the impact of deeper than natural river beds and the resulting low and medium water level subsidence	yes	yes	-	yes	yes	yes	yes
	6.12.2	Compensatory floodplain afforestation in a flow hollow	-	yes	-				
	6.12.3	Reconstruction and maintenance of in-stream facilities, including the use of near-natural solutions and materials	yes	yes	yes	yes	yes	yes	yes
	6.13	Adaptation of navigation to river or still water conditions	yes	yes	yes	yes	yes	yes	yes
Measures to improve water flow and ensure the protection of ecological freshwater	7a.1	Registration, review, modification and authorisation of surface water abstractions and diversions	yes	-	-	-	-	-	-
	7.3.4	Modifying water sharing to provide ecological small water	yes	-	-	-	-	-	-
Specific hydromorphological and water quality protection measures to improve the status of protected natural areas	33.2	Specific hydromorphological measures to improve the status of protected natural areas, including specific regulation of water abstraction, water management and water recharge to meet conservation needs	yes	yes	-	yes	yes	yes	yes
	6.8a	Restoring the connection of cut-off bends, silted-up backwaters and tributaries to the main branch, ensuring regular flooding of the floodplain or open floodplain	yes	-	-	-	-	-	-
	6.9a	Raising the sea level with bottom dikes and bottom fins, by silting up the bed between them	-	-	-	-	-	yes	-
	7.1	Modification of the inland water drainage system	yes	yes	-	yes	yes	yes	yes

Measures			Name of water body						
Categories	**Number**	**Name**	**On the Danube Island**	**Danube between Gönyű-Szob**	**Danube-Budapest**	**Danube between Budapest-Dunaföldvár**	**Danube between Dunaföldvár and Sió estuary**	**Danube between the Sió estuary and the border**	**Danube between Szob and Budapest**
	34.2	**To ensure the water quality required for nature conservation, in addition to other water quality protection measures.**	-	-	yes	-	yes	-	-

Annex 4

DANUBE WATERWAY DEVELOPMENT PROGRAMME

Requirements set out by environmental authorities and other organisations in previous procedures

September 2020

OPINIONS, SUGGESTIONS

1 General comments on the design

- The development of major transport routes (including waterways) does not in itself necessarily lead to the economic and social development of the regions concerned, nor does it in itself help the catching-up of lagging regions. (In fact, it may be that regions with a stronger, more structured economic structure will be better off and those lagging behind will be further disadvantaged by the 'resource pump' that is set in motion.) The development of shipping is also likely to reduce the burden on roads substantially if it is accompanied by the entry into force of other regulatory instruments that shift road transport to waterways (e.g. tolls). At the same time, this will require a more rational use and qualitative improvement of the existing infrastructure (mainly railways and road networks within the region), their coordination and the adoption of measures to avoid possible accidents, so that socio-economic development can be achieved with less pressure on the environmental system, i.e. green light must be given to developments that reduce the current pressure. In this respect, it is **essential that environmental and cost-effectiveness studies are carried out and their results taken into account in order to ensure that domestic interests are properly taken into account** (National Council for Sustainable Development 2010)**.**
- **The navigability conditions project focuses primarily on river management works and not on transport development as an interconnected system**. In their opinion, it is essential that, in addition to the study of the river basin management works, the study of intermodal centres as transport links and the related infrastructure be included in the study and conditions. The comparison of the relationship between road transport and waterway transport and the environmental benefits of waterway transport with road transport can obviously only be of a general nature, and therefore the statement on the decongestion of urban through-roads, for example, is not justified, as this has no direct connection with the navigability of the Danube (a road network issue). (National Inspectorate for the Environment, Nature Conservation and Water Management 2012)
- An environmental assessment should also be carried out as part of the project, which analyses the effects of the planned interventions of the project as a whole and comprehensively, not just for its components. I would like to draw your attention specifically to the importance of a **joint assessment.** All options and interventions for the improvement of the waterway (e.g. modern navigation systems, development of a suitable fleet) should be considered together. (VM, 2011)
- We consider it necessary to present in detail the results of the calculations and modelling studies related to the assessment of the **cumulative impacts of** all the planned technical interventions in the Danube riverbed. Another important risk element is that the implementation of the project, which is planned as a major investment, will only offer the possibility of transport by water in the future, but its utilisation is uncertain, as it will depend on the ad hoc decisions of market operators. (National Environment, Nature and Water Inspectorate 2012)
- The European Commission has made several statements to this effect and will check whether the following have been **proven:**

„a) all possible steps are taken to mitigate the adverse impact on the status of the body of water;

b) the reasons for the changes are detailed in the River Basin Management Plan ... and the objectives are reviewed every six years;

c) the changes or modifications are in the overriding public interest and/or where the benefits to the environment and society of the objectives set out in paragraph 1 (the *reference is to the first paragraph of Article 4 of the Water Framework Directive entitled Environmental*

Objectives) outweigh the benefits of those changes in terms of safeguarding human health, safety or sustainable development,

d) the beneficial objectives served by the modification or alteration of the water body cannot be achieved by other means that are significantly more beneficial to the environment because of technical feasibility or disproportionate costs,

e) (the *change or modification*) does not preclude or permanently compromise the achievement of the objectives of Directive ... for other bodies of water within the same river basin district and is consistent with other Community environmental legislation." (National Environment Council 2010)

- No **monitoring** proposal has been prepared in sufficient detail to demonstrate the impacts. The aspects to be taken into account are also addressed in point 19 of the OSP Resolution. (OKT Resolution, January 2010, WWF 2011) The OKT draws attention to the need for a strong emphasis on environmental **monitoring in** the design, implementation and operation of interventions. If a type of intervention causes unanticipated adverse effects, it should be reviewed and a similar type of intervention should not be used in similar circumstances. Monitoring should start by assessing the baseline condition prior to the intervention so that any negative effects can be observed. (National Environment Council 2010)
- Continued attention should be paid to the progress of **projects in other countries to** improve the Danube waterway in order to ensure coordination. Improvements in the fleet and logistics that allow waterborne transport without environmentally damaging interference should be implemented. Environmental **monitoring** should be a key element in the design, implementation and operation of the intervention. (ADUKÖVIZIG, 2011)
- In the SEAs for both domestic sections, the OKT would have considered it important to compare the planned interventions on the domestic Danube section and on the foreign sections of the Danube, and to examine the possibilities of coordinating the ongoing planning processes. It draws attention to the need to pay particular attention to this in future planning. (National Environment Council 2010)
- Constant attention should be paid to the progress of Danube waterway improvement projects in **other countries** and the parameters of the waterways of the variants to be implemented should be harmonised. In the future, improvements should be made to the fleet and logistics to enable waterborne transport without any adverse environmental impact. (National Sustainable Development Council, 2010).
- Both SEAs draw attention to the need for **complementary measures** (e.g. port development, related infrastructure, forecasting systems, establishment and development of green terminals in ports to receive and treat ship-generated waste and polluting substances, etc.). These proposals should be coordinated and designed to minimise environmental and ecological impacts, taking into account the SEA proposals. (National Environment Council 2010)
- As in the river basin management planning process, particular emphasis should be placed on ensuring the **active participation of society** in the planning process of the Danube Strategy development programmes from the very beginning of the planning process. (National Council for Sustainable Development, 2010)
- The EDS is set over a **period of** several decades, so the strategy should give priority to preparing for the changes (in particular extreme weather events caused by climate change, significant water scarcity, the end of the oil age) that will pose qualitatively new challenges to human civilisation. (National Council for Sustainable Development, 2010)

2 Conditions and impacts of the creation of a fairway

2.1 Issues related to fairway width

- The parameters of the waterway should be in accordance with the AGN Convention, which should be interpreted jointly with the Danube countries. **We agree with the German position that the EU Strategy for the Danube Region is excessive in its requirements for fairway parameters.**
- If the protection of nature and the water basin requires it, the possibility should be **taken to prevent vessels from meeting in the narrows**. (National Environment Council, 2011)
- **As an alternative, the analysis should have considered how much less intervention would be needed to ensure one-way passage of vessel traffic**. In the case of one-way passage, there is no need to maintain a fairway 180 metres wide, 120 or 150 metres would be sufficient. Despite the one-way passage, navigation aids can be used to ensure vessel traffic, but the less intrusive the less harmful the impact (WWF).
- Most of the fords and narrows currently considered as a barrier to navigation are probably the erosion threshold that is currently still limiting further deepening of the bed. As can be seen from a comparison of the 1990 and 2004 LKHV levels, the riverbed has now stabilised in most parts of the Danube river section under discussion, following the cessation of the former heavy industrial dredging. **However, the more these thresholds are disrupted by the planned works, the greater the risk of a resumption of deepening processes**, which would result in less favourable conditions for tributaries and water bodies than at present. **It would therefore be advisable to consider interventions corresponding to a width of 100 m (80 m plus 10-10 m safety) instead of a maximum fairway width of 180 m**. (KDVKÖVIZIG)
- Investigation of reducing the width of the fairway to -90/120 m, or to create the smallest possible width sufficient for one-way vessel traffic (KÖFE gap-filling per site: Dunafüred-Ercsi, Vác, Sződliget, Göd) KDVKÖVIZIG: The **possibility of narrowing the fairway should be investigated in order to minimise environmental impacts.**
- **The need for a 180 m wide waterway should also be reviewed to protect water resources.** As far as we know, the European Union does not impose this width on Hungary (the planned width at the Göd gas lake is 150 m). By reducing the width, it is expected that less gravel would have to be dredged from the bed, which would create a more favourable situation for the protection and operation of coastal filtered water bodies. The fairway should be set in such a way as to minimise the risk to the aquifers, i.e. the fairway should be as far as possible from the coastal zone affected by the aquifer. (Danube Regional Waterworks)
- The navigation route must be designed in such a way that **dredging operations do not approach the boundary of the outer protection area of the water body within 50 metres** (in connection with the waterworks of Budapest in Árpádhíd, Budafok, Százhalombatta, Dunafüred-Ercsi)
- The SEA does not consider the option of reducing the width of the fairway as an alternative to implementation, which would not meet the requirements of the SEA. A fairway with continuous two-way traffic and a 94% durability cannot be derived from any international legislation and goes far beyond our obligations, which have been highlighted in recent resolutions (e.g. Parliamentary Commissioner for Future Generations, National Council for the Environment). Meeting these exaggerated parameters would have negative consequences for Hungary from an ecological, economic, competitiveness and sustainability point of view, would seriously harm Hungary's interests and would serve foreign interests in an unacceptable way, while Hungary would have to cover the costs. If completed, it would effectively turn our stretch of the Danube, which still retains its natural image, into a canal. Hungary does not wish to comply with the above-mentioned

exorbitant parameters of the shipping route (180 m latitude and 27 or 29 dm depth for 343 days), in accordance with the decisions and resolutions taken at several meetings of the Council and the political groups. (VM, 2011)

2.2 The fairway depth related issues

- A draught of 2.5 m must be ensured, plus a safety margin of 2-3 dm depending on the material of the bed. (National Environment Council, 2011)
- A further problem is that the main baseline data for the current design are the fairway depth parameters relative to the current LKHV levels in the sections. These levels were calculated on the basis of a water level survey carried out in 2003, but the Danube bed is far from being constant in the time that has elapsed since then and is expected to remain so until the actual construction. It **would therefore be worthwhile to determine the LKHV levels corresponding to the current realistic bed morphology on the basis of a new riverbed survey** (e.g. the one carried out by VITUKI in 2009, which forms the basis for the water rights permits**) and an updated hydrographic dataset, and to plan further interventions accordingly**.

2.3 Other

- **For Hungary, there is no reason to set a level higher than the minimum international requirements** (i.e. the AGN Convention), for which the implementation of a scenario focusing on top gasifiers is sufficient. However, it is in its interest to negotiate a way forward towards the partial or full implementation of a shipping-oriented scenario, if developments, cooperation and international transport agreements can be developed to support shipping through complex means. (BCE, REKK 2010)
- Decisions on interventions to ensure the parameters of the fairway should be based on the results of the Water Framework Directive 4.7 tests carried out on the Danube water bodies concerned and the Strategic Environmental Assessment and Environmental Impact Assessment based on Natura 2000 impact assessments and "Habitat Tests" carried out on the Natura 2000 sites concerned. (National Environment Council, 2011)
- We consider this **low water level rise in the** section between Dunaújváros and Danube Vltava as one of the main problems of the Hungarian Danube section, both from navigability and other aspects, which, in our opinion, can only be stopped and eliminated by interventions in the ADU-KÖVIZIG area. **To achieve this, instead of the current planning process, which is broken down into different phases, a more uniform planning approach** (bottom-up, i.e. in the direction of the sectional design) **would be required for the entire Hungarian section**, which would be **more in line with the principles of hydraulic engineering,** since without the results of the interaction of the interventions carried out at individual locations being calculated at the planning stage, the final result could differ significantly from the hoped-for one. (KDVKÖVIZIG)
- In the event of **a failure to carry out maintenance work, bottlenecks may re-emerge** as a result of adverse changes in the riverbed caused by high water and/or ice flow.
- Due to the Natura 2000 implications of the entire DHJ project, it is not technically supportable at all without a real **alternatives assessment and a** proper analysis of **cumulative impacts.** In terms of impact on Natura 2000 sites, all interventions and installations for the benefit of navigation that may have an impact on the conservation, maintenance and functions of these sites should be considered as a project. (VM,2011)
- While no divergent **solutions** have been **proposed, the planner has not justified why the proposed solutions are the most environmentally beneficial** (WWF, 2011)

- From an **economic** point of view, only such development should be carried out where the depreciation of the total economic value of the natural capital in the Danube and its tributaries is demonstrably lower than the social benefits of the development of navigation (from a conservation point of view, zero depreciation would of course be desirable).**All these observations lead to the conclusion that the indirect social benefits of the development of navigability should in any case be higher than the depreciation of the natural capital due to the interventions**. Studies on the cost estimation of the interventions should have been carried out before the planning process started. Although this has not been done, a detailed assessment, based mainly on a questionnaire survey, is still necessary before the interventions are carried out, because the economic assessment can be used to validate the points made in the plans. It is just as important to use the experience gained from the economic appraisal to monitor the interventions that we hope will cause the least ecological damage, and to apply the experience gained in the course of the interventions, which will take place in different phases, probably between 2011 and 2014. (Harangozó, Széchy, 2010)
- The CIS guidance (2009) informs that the identification of a **public interest** category also **requires a public opinion survey and public involvement**. This was not examined during the project, and was not discussed at the civil forums, which were held with very low participation, nor did the Consortium seek to gain knowledge of this in any other way. (WWF, 2011)
- **The number of days that the project will extend the navigability of the Danube, if it is completed, and the frequency of the interruptions if it is not, should be examined**. (KÖFE gap filling: Mohács)

3 Water status issues (including issues related to silt and soil)

3.1 Generally

- The assessment of environmental impacts does not include **impacts on the general ecological status of the water body**. The Strategic Environmental Assessment includes the statement that there is potential to maintain the good ecological status or potential of the Danube, but this statement is not substantiated in this analysis and therefore does not meet the assessment required by Section 4.7 of the SEA. (WWF, Visegrad)
- **Aquatic life** has adapted well to natural fluctuations over long evolutionary cycles, but it cannot withstand civilisation changes of very short duration without being damaged. It is therefore up to human society to recognise and take account of this irreversible fact, all the more so because it has the technical and technological means to do so. **Human activity must** therefore be **adapted to the natural conditions**. (National Council for Sustainable Development, 2010)
- It is not possible to formulate universally acceptable and uniformly applicable ecological guidelines for the Danube water system. Each water body, and thus each watercourse, and even each level of each watercourse, has **unique** ecological **characteristics** that cannot and should not be ignored. However, the science of ecology has identified the main characteristics of watercourses and their different levels[1], and of the associated water bodies (e.g. dead pools), which allow them **to be classified into hydro-ecological types, and thus allow a more comprehensive analysis and assessment of the**

[1] From the headwaters to the estuary, watercourses offer a wide variety of habitats for fish, providing suitable conditions for a wide range of species with very different needs. Depending on which species are found in the conditions resulting from the ongoing changes in the river, certain species may be found in certain stretches of the river. This type of pattern of occurrence, which varies along the course of the river, is called a stage. Each stage (fastigium) is named after the species most characteristic of it.

effects of intervention and management methods, and the anticipation and prevention of adverse impacts. In the light of the above, ecological variability may also require or allow for completely specific, site-specific interventions and management, which should be recognised and communicated in the international reconciliation of interests. (National Council for Sustainable Development, 2010)

- The hydromorphological conditions that are essential for the development and persistence of the Danube's characteristic wetlands and associated **ecosystems** must be preserved. The uniquely diverse pattern of wetland types is also a prerequisite for the high biodiversity of the Danube river basin, the protection of which requires a land use and agricultural strategy that is consistent with this, recognising the public interest in ecosystem services. (National Council for Sustainable Development, 2010)
- There is a lack of **comparative assessment of** interventions that modify the hydromorphological conditions of the riverbed (spurs, diversions, dredging...), their ecological impacts and, on this basis, technical recommendations for detailed design (WWF, 2011).
- The 2.2 +/- 2 water level reductions at the lowest recorded water level of the Danube reduce the area **covered by water by how much** in the length section of the section affected by the intervention and what is the impact. (KDV FE gaps: Vác, Göd)
- The **interventions in the tributaries** require further consultation with the parties concerned (DINPI, KDV-KÖVIZIG, KDV KTVF, WWF, local government, managers of the affected aquifers... etc.) for the future sustainability and utilisation of the tributaries. Bearing in mind the long-term effects of the interventions (low water level subsidence resulting from the scouring of erosion thresholds), **we do not consider even the smallest water level subsidence - as shown by mathematical modelling or small-scale sampling experiments - to be acceptable** in the vicinity of the main branch interventions included in the current authorisation procedure or in the plans to be submitted subsequently. (KDVKÖVIZIG)
- More detailed studies are needed on the effects on surface and groundwater resources management, water level swelling, bed deepening (scouring of erosion thresholds), water velocities, sediment transport and the cumulative effects of these local effects on the whole Hungarian Danube. In order to assess these potentially adverse effects more accurately, it is considered necessary to carry out **hydrological and hydrogeological modelling**, hydrological and seepage hydraulic calculations based on the specific data of the alternative A proposed by the designer. However, the detailed results of the evidence, modelling studies, hydraulic calculations and cumulative effects studies referred to by the designers were not included in the documentation for the environmental assessment, and no detailed information was found on which parameter variations and intervention variations were run in the models. The assessment of the cumulative effects of the planned interventions is essential, but the importance of local effects is not negligible. In particular, the Barakai gas lough may act as a bottom threshold in the low water level of the riverbed during low water periods, and thus may push the Danube water level back by a few decimetres. In our opinion, in this case, **it should be examined as a matter of priority whether the planned interventions at the Barákai gas lough - especially during extreme low water periods - will not endanger the operation of the water intake of the Paks nuclear power plant** (National Environmental, Nature Protection and Water Inspectorate 2012).
- The impact of the deepening of the riverbed and the resulting lower water levels (especially during low water periods) **on tributaries** should be examined. Determine the periodic variation in water cover and, if expected, changes in flow conditions, and answer whether and to what extent the successional processes in the tributaries are affected by subsidence. The extent to which changes in the abiotic parameters of a given tributary affect the current communities, faunal composition and population size should be investigated.

3.2 Media

- The **area to** be dredged (main branch, tributary), the pre-dredged and the desired bank condition, the composition, thickness and location of the current and the proposed post-dredged bank material should be described in text and also shown on site plans and sections. The **area of indirect impact of the dredging activity on the geological medium shall be determined and demonstrated by means of calculations**. The arrangements for the technical supervision of the dredging operations and the way in which the excavated material is to be documented shall be described. Measures and techniques to prevent pollution of the environment shall be described. (Addendum: KDV Inspectorate Árpádhíd)
- During the excavation of the bed, it is important to remove the **test components of the excavated sediment** (KÖFE gap filling: Budafok, Kulcs). The **rock physics parameters of** the removed sediment (e.g. rock composition, grain size, distribution, etc.) should be described in the sampling. Thickness and location **should be presented in** text, on site plans and in the form of a section of the bed (supplement requested by the KDV Inspectorate: Dunafüred, Árpádhíd).
- The quality assessment of dredged material is governed by Government Decree 219/2004 (July 21) on the protection of groundwater. Annex 1 to the Regulation contains a list of **components to be tested.** According to the Regulation, the indirect discharge into groundwater of pollutants listed in Annex 1 or of substances containing such substances or, in the event of their degradation, leading to the formation of such substances, is prohibited. According to Annex 2 of the Regulation, the areas of high groundwater status are the hydrological protection areas of operational and remote drinking water sources, designated or predefined by a separate legal act, in accordance with the internal, external and final water law decision.
- Demonstrate **what happens to the excreted sediment in case the** quality requirements are not met by the values tested in the rapid tests (KÖFE gap filling: Budafok, Kulcs)
- The impact assessment does not address **the potential and risk of overdrainage** during construction**, especially as the intervention will also affect the protection areas of the operating aquifers**. Excessive dredging may lead to further damage to the active gravel layer (which has both a filtering and a transport function), which plays a key role in beach filtration, thus jeopardising the safety of water production in terms of quantity and quality. (Metropolitan Waterworks, Árpádhíd)
- A more detailed justification is needed on **how the retention of the** excavated and dumped **sludge** from the riverbed **can be achieved without technical stabilisation and protection**. If there is a possibility of the landfilled sludge being washed away, please also investigate the location of the sludge landfill and its impact on aquifers. (Danube Regional Waterworks)
- **The placement of loose dredged material in the riverbed will only be accepted if the material is properly mechanically stabilised at the installation site** to prevent drifting (KDVKÖVIZIG in relation to the Árpádhíd gas lough, Százhalombattai, Dunafüred and Ercsi constrictions)
- The potential **sedimentation of silt from** dredging, which is a major source of sediment, in the lower river sections, by clogging the pores of the sandy gravel bed, may also weaken the effectiveness of natural biological filtration, which is of great importance in water abstraction. This negative effect could potentially lead to a deterioration of water quality in the southern reaches, e.g. the Ráckeve wells. (Metropolitan waterworks Dunafüred-Ercsi, Budafok)
- The material of the **landfill** has water-conducting properties, and its positive impact on the aquifer can only be expected if the landfill is in a silt-free location. The study should

demonstrate that the proposed disposal site is silt-free and should show the expected siltation in the dead space of the bottom fins.

- During the construction works, special attention must be paid to ensure that no **pollutants** are discharged into the Danube from the construction machinery and watercraft. Please prepare a monthly plan for the construction period. If **an incident should** occur during the dredging, the operator of the water basin must be informed immediately. (Danube Regional Waterworks)
- The disposal of tens of thousands of cubic metres of dredged material in the riverbed cannot be done with cartographic accuracy, so it is inevitable that it will not be deposited in the protected area of the affected aquifers. We therefore request that the above-mentioned tests for the disposal of dredged material at the water sources be carried out as detailed above(!). Before planning the disposal of dredged material, please verify the quality of the material by taking representative samples of the material to be disposed of. If the plan is approved, please carry out the tests every 1000 cubic metres during the deposition of the dredged material (Metropolitan Waterworks, 2011).

3.3 Protection of aquifers

- Clarification of the **basic data of the** remote **water sources in** the Danube sections concerned, as well as the **mapping of the** planned **waterworks and protection zones** (KÖFE gap filling: Kovácspuszta-Siótorok)
- The **projections for the aquifers** are not well supported (by calculations and modelling), and **the aquifer workstream is not as well developed as the wildlife and noise workstreams**, although the aquifers concerned provide drinking water for hundreds of thousands of consumers. **In the event of negative changes in the operational parameters of the wells or in the quality of the produced water after the river basin interventions, our Company will request appropriate compensation** (e.g. construction of a water treatment plant, removal of silt from the shoreline affected by the water supply, replacement of the water supply, etc.) (Danube Regional Waterworks)
- It is reported in several places that **water quality may deteriorate intermittently** during dredging and until the filter bed is rebuilt. Please provide details of what this means for each individual water source (with deteriorating parameters) and include in the impact assessment an assessment of the possible consequences of the loss of water supply from production wells that produce water of unsatisfactory quality in connection with dredging (Danube Regional Waterworks).
- The impact of **dredging and diversion works on long-term aquifers should be presented on the basis of calculations, taking into account long-term changes in the river basin**. The extent to which the intervention will result in **a change in flow** compared to the design capacity of the long-term aquifer should be determined. According to Annex 5 of Government Decree No 123/1997 (18 July 1997), "Other activities affecting the cover or aquifer" are prohibited in the inner and outer protection zones. Furthermore, during the disposal of the dredged material, the fine particles present as a fraction of the sludge are discharged as suspended solids into the water at the landing site, which, if settled out, also have a detrimental effect on the aquifers. (KÖFE gap filling: Kovácspuszta-Siótorok)
- The impact assessment only addresses the dredging and disposal impacts for operational aquifers, whereas the improvement of the navigability of the Danube affects the strategic coastal filtering aquifers for public drinking water supply not only at the time and place of the interventions. In addition to the negative impacts of interventions to improve the navigability of the Danube, we also ask that the potential for bank and riverbank erosion due to significantly **increased vessel traffic, as** well as possible accidents related to the transport of hazardous substances and oil spills, be examined in relation to the aquifers.

- When planning, please take into account the provisions of Article 12(4)(d) of Government Decree 123/1997 (VII.18.), according to which the bed conditions of river sections may only be changed in the case of **beach filtered water abstraction in such** a way that this does not have a detrimental effect on the quality of the water abstracted.
- The Government Decree 123/1997 (VII.18.), § 13. (1) b), it is prohibited to carry out any activity in the hydrogeological protection zone or in the area of the protection zone that would reduce the **natural protection of the water resources** or increase the vulnerability of the environment.
- Before dredged material is deposited in the **protection zone of** a water body, **sludge must be removed from the bottom of the bed by dredging if the average thickness of the sludge exceeds 5 cm**. If the thickness is less than this, the silt may remain if it is shown in an impact assessment that the deposited sediment does not cause qualitative or quantitative problems. Vacuum-cleaned sludge shall be disposed of outside the protection zone.
- The effects of changes in aquifer thickness on **recharge** conditions in the aquifer need to be clarified, and changes in the sensitivity of the aquifer to downstream pollution need to be estimated. The extent to which suspended sediment disturbed by bed scour impairs the aquifer's ability to recharge and results in water quality degradation should be investigated in detail.
- The **operator of the aquifer should be consulted on the** need to **restrict the operation of the waterworks wells for the duration of the planned dredging activity**, possibly by temporarily withdrawing the well groups nearest to the dredged areas from production.
- The expected change in **infiltration conditions** in the catchment recharge area and its expected impact on the catchment should be described, and changes in the sensitivity of the catchment to upstream pollution should be estimated. Consultation with the operators of the aquifers is essential in order to estimate the expected impacts and to accurately assess the current situation. (Addendum: KDV Inspectorate in relation to the Árpádhíd)
- The impact assessments identify the threats to water bodies, the extent of the threats, **but do not specify the impact on the specific water body** and **do not propose how to address them**. On this basis, these EIAs can only be assessed in terms of the problem statement. (KDVKÖVIZIG on the Váci, Sződligeti and Göd gas dikes)
- In case the flow dead space of the diversion works encroaches on the planned installation area of a remote aquifer, the thickness of sediments deposited in the flow dead space increases, reducing the water carrying capacity of the riverbed. The reduction of the **water carrying capacity of the riverbed** may reduce the capacity of the remote bank filtration aquifers, the share of Danube water in the water to be extracted decreases, thus increasing the role of the background.
- Bed scouring reduces the biological integrity of coastal filtration waters, but this effect is temporary. The **in-bed disposal** (spreading) of excavated **sediment** can also increase the sediment thickness in the bed. (KDTKÖVIZIG 2010)
- Potential impacts on **coastal filtering catchments** are identified, but detailed analyses have not been carried out, although this would be necessary, particularly to assess the likely impacts on water quality. Methods and models are available in connection with diagnostic work on coastal filtration basins. (WWF, 2011)
- The increase in the share of **groundwater** inflow from the background may also lead to a deterioration in the quality of the water that can be extracted from the distant aquifer, as the quality of groundwater is much worse than that of the Danube for many water chemistry parameters (iron, ammonium ion, nitrate, etc.).

3.4 Effects of operation

- The **increase in traffic** from diesel-fuelled **transport will increase the risk of oil pollution in the river**, which needs to be controlled to protect water resources. The effects of such pollution and the possibilities for combating it, as well as the increased demands on equipment and human resources, are not addressed in the study. (Metropolitan Waterworks, Árpádhíd).
- The causes of **accidental pollution,** some of which are **shipping disasters**, can be many: accidental failure, accident, human negligence, deliberate damage. A **risk analysis of** these from the perspective of water resources is missing from the impact assessment (Budapest Waterworks, Budafok).
- The **status of all the Danube tributaries concerned has not been analysed in detail**. Only those **tributaries** where habitat restoration is planned have been assessed, although all tributaries along the Danube will be affected by the interventions and may well not be separate water bodies, so it is worth considering them separately. (Plans for rehabilitation of tributaries are only part of the project to ensure navigability to the extent that they are about compensating for the adverse ecological effects of navigation. It should be noted, however, that the proposals in the project do not meet the wider ecological requirements of restoration and do not effectively serve the fundamental objective of biodiversity conservation.) (WWF, 2011)
- The studies do not provide an adequate estimate of the large-scale **changes in** the ecological and hydromorphological status of the river. Increased vessel traffic and possible further deepening of the river bed will have an impact on the whole water body. Ecological changes that appear locally negligible may be cumulative (as indicated in point 6 of the OKT Resolution, OKT Resolution, January 2010). Not only preparatory analyses are lacking, but also solutions to address the problems. (WWF, 2011)

4 Geology

- The evaluation should take into account the current **state of affairs,** since in the literature events that have actually taken place over several decades have been recorded and studied.
- When designing and implementing the various work components, it is recommended that the initiating, intermediate and validation sites within the total area under study are always **separated, as it** is not necessary to provide an engineering geological assessment for natural process(es) in retrospect, but for the intended human activity.
- The 2011 verification measurements at some of the remaining points of the archival geodetic monitoring can provide baseline data to assess robustness.
- In the basic stability data and in the **modelling,** it is recommended to take into account that the current and future operability of the previously partially constructed drainage system - with a sliding slab overlay - will definitely influence the long-term stability of the high bank.
- If different dates of bed slope are available, it is recommended to examine the morphological conditions at the bed-side of the sliding slab at different dates.
- Material tests and sampling locations should only be used to make a final decision once the current conditions and the extent and location of any activity are known.
- After a combined assessment of the archived movements and the current conditions, the total area for which the **stability modelling** should be carried out should be determined.
- When delimiting the study area and in the stability modelling, it is recommended to take into account that **locations outside the frontal fracture(s) with** different timing and

development represent, in addition to the possible expansion of the area, the development of new gravitational mass movement events and one of the possibilities for the renewal or renewal of the previous ones.

5 Habitat (specific guidelines for wetland habitat in the wetland chapter)

5.1 Generally

- In the impact assessments for NATURA 2000 sites, the possibility of adverse impacts on the animal or plant species concerned is mentioned in several procedures, and it is proposed to prevent this by limiting the time of interventions. The **project has not demonstrated whether a more ecologically beneficial solution exists**. In view of the uncertainties, it is important to demonstrate that the **option** adopted is the **most favourable in terms of ecological impacts**. (An exception may be justified if the cost is disproportionately high). This is not clear from the material available. (WWF, 2011)
- If interventions affect a Natura 2000 site, the **overriding public interest and the** obligations under other N2000 legislation must be justified, with detailed justification. (WWF, in relation to Kulcsi gázló)
- The Natura 2000 site regulations set out the conditions that must be met before an intervention in a Natura 2000 site can have a negative impact on nature:
- "If, despite the unfavourable outcome of the assessment of the implications for the site, a plan or programme must nevertheless be implemented in the absence of an alternative solution, taking into account an overriding Community interest of a social or economic nature, the Member State shall take all **compensatory measures** necessary to safeguard the overall integrity of Natura 2000. The Member State shall notify the Commission of the compensatory measures adopted. Where the site concerned contains a priority natural habitat type and/or is the habitat of an endangered species, only considerations relating to human health, public safety or environmental priority and, in the opinion of the Commission, overriding reasons relating to the public interest shall prevail."
- "The Inspectorate shall **require the** developer of the plan or the project promoter to **carry out restoration and development work on the site concerned or on another site, in proportion to the expected adverse effects, and to compensate for them, in** order to maintain the integrity of Natura 2000 sites and the favourable conservation status of habitats and species, or to achieve this." (OKT 2010)
- **Alternative solutions that would give** greater weight to environmental and conservation concerns would be important. In case of negative impacts on the Natura 2000 species population of the site**, compensatory measures** should be presented in addition to the alternatives (KÖFE gap-fill per site: Visegrád, Budafok, Kulcs)
- The survey of the habitats and spawning areas of Natura2000 **candidate and protected species in the** area of intervention, as well as the potential spawning areas of the species concerned in the area of influence during the spring spawning season and the results on **maps are missing** (KÖFE gap filling: Visegrád, Vác, Dunafüred-Ercsi, Budafok, Kulcs, Dömös, Göd, Sződliget)
- Affected **candidate habitats, location of species**, expected adverse effects shown **on map appendix**. (NODC gap-filling: Dömös)
- **Clarification of the population size of the** candidate species/habitats concerned in the area and the **estimated extent of the** likely **negative impacts** on their conservation status.

- Project's **cumulative impacts** should be taken into account to determine the species' survival potential, given that the river regulation will affect the habitat and breeding sites of protected and Natura 2000 species in several places along the Danube (alternatives assessment, compensatory measures) (KÖFE gap-filling: Visegrád, Vác, Dunafüred-Ercsi, Budafok, Mohács, Dömös, Sződliget, Göd)
- The detailed impact assessment of the proposed action should include an assessment of the **longer-term expected impacts** (e.g. changes in the river bed and typical water levels) in addition to the immediate impacts of the action, and the impacts of any further river management interventions that may be necessary as a result of the proposed action. **Analysis and modelling of the subsequent long-term effects (5-10, 20 years) of the intervention, taking into account the natural deepening of the riverbed, should be carried out**.
- Whether, and to what extent, the **combined spatial effects of** the proposed activities could adversely affect the future conservation status of Natura2000 candidate species. (KÖFE gap-fill: Visegrád, Kulcs)
- It should be examined whether the planned **filling** from dredged material **will affect valuable habitat or wintering sites** (KDV Inspectorate addendum: Vác, Sződliget, Göd)

5.2 Impacts on the operational chain

- Whether there is a cumulative effect over time of **maintenance dredging on the** future conservation status of Natura2000 candidate species. (KÖFE gap-fill per site: Visegrád, Kulcs)
- Analysis of the potential impacts of **increased shipping traffic on** Natura2000 candidate, protected and specially protected fish species, supported by studies (KÖFE completion per site: Visegrád, Vác, Sződliget, Göd)
- The impact of the project **on the** habitat, breeding habitat, reproductive capacity and development of the Natura 2000 candidate and protected species present in the area should be assessed, according to the following criteria:
    a. due to expected changes in depth, flow velocity and substrate quality
    b. increased traffic on the waterway and the associated waves (KÖFE gap-filling: Dunafüred-Ercsi, Dömös, Visegrád)
- Estimation of the impact of the **current intensity and frequency of coastal and near-shore wave action** on the habitat, reproduction capacity and development of Natura 2000 candidate and protected species detected in the area due to more intensive **vessel traffic and the** use of **vessels with greater draught depths (**KÖFE gap-filling per site: Budafok, Kulcs) It is not known how the impact of this can be mitigated (WWF, in relation to Kulcs gas locks).
- The study does not analyse at all the impact of **wave action from ship traffic on riparian vegetation in** relatively narrow breakthroughs. How much damage is caused to juveniles and how coastal macroinvertebrates respond to increased ship traffic (WWF, Visegrad)
- Investigation of the effects of **altered depth and substrate quality** on the habitat, reproduction and development of Natura 2000 candidate and protected species detected in the area (KÖFE gap-filling per site: Budafok, Kulcs)
- The **impact of a 5 cm/s decrease in water speed on reophilic fish species** should be investigated. (KDV Inspectorate: Vác, Göd)

5.3 Landscape

- It is essential that landscape impacts are not only addressed at the level of interventions. For example, the Danube Bend is one of the most popular tourist destinations along the Danube. **It is necessary to assess the impact of the increase in boat traffic on the tourism potential**. The temporal impact of interventions should also be interpreted for the period of future maintenance works. (WWF, Visegrad).
- The main ecological problem with the programme is that it targets a specific area of navigability and not a complex 'landscape-level' management of the river and its riparian areas. Therefore, the ecological, habitat protection measures behind the navigability programme appear only as compensatory measures. However, the study suggests that the risk from a nature conservation point of view is caused by the associated impacts and not by direct interventions. Landscape protection is mentioned under 6.2.2.4.2 'Nature and landscape protection', **but in our opinion it is precisely at the landscape level, and the landscape protection aspect of the study is less developed.** (National Inspectorate for the Environment, Nature Conservation and Water Management 2012)

6 Air, noise

From the point of view of air quality protection, the waterway development programme aims to reduce air pollutant emissions from transport. Of the modes of transport, waterborne freight transport has significantly lower emissions of air pollutants per tonne-km of freight compared to road transport. Based on the projections presented in the study, a significant modal shift from road to waterborne transport is also projected to result in only a small reduction in road transport. This is because the increase in road traffic resulting from the continued increase in freight demand and other types of vehicle use (e.g. passenger cars) will exceed the rate of traffic reduction resulting from the modal shift to waterborne freight.

With the increase in combined transport, an increase in environmental pressures is expected in the vicinity of the Danube ports and on the routes connecting to the ports, but this will be substantially outweighed by the reduction in pressures resulting from lower emissions from the transfer of transport traffic from road to waterway. **The environmental noise working part is very limited and it is not possible to give a detailed opinion on the basis of the available data.** (National Inspectorate for the Environment, Nature Conservation and Water Management 2012)

7 Specific opinions for specific sites

Dömös (KÖFE gap-filling)

The possibility of **creating an artificial reef with** a shallow gully to replace the peninsula above the high water level should therefore be explored, which could be seen as an improvement to the habitat conditions for Natura 2000 species. In order to protect the reef from wave action, it is proposed to slope the reef down towards the left bank and to convert the pebbles into a gravel habitat.

Bölcske-Harta (KÖFE)

It needs to be clarified whether the diversion at 1551.4 km on the Danube needs to be extended or not.

Paks: (National Nuclear Energy Office)

Remedy: The Danube water level changes caused by the planned regulation, including an assessment of the potential changes in the river basin caused by the regulation, and their impact area, the existing and planned water uses in the direct and indirect impact area, their water demand, the assessment of the impact processes and the **demonstration that the**

planned activity and its implementation will not adversely affect the operation of the Paks NPP.

Baráka: (National Nuclear Energy Office)

Gap filling: assessment of whether the activities underlying the EIA procedure (sediment removal, construction and modification of diversion works), in particular dredging, are likely to result (even in the long term) in a deepening of the bed or other changes in the water level of the Danube river that would **affect the ability of the Paks NPP to withdraw or discharge cooling water**. In this context, assess the possibility and necessity of maintaining, lifting on a one-off basis, modifying, permanently and completely lifting the industrial dredging restriction in force from 30 June 1985 between 1505 and 1536 km, as referred to in the letters annexed to the order.

A quantitative (percentage or ratio) assessment of the **expected increase in the annual transport of hazardous substances** (e.g. explosives, certain gases, etc.) in the **Danube section near the Paks NPP** following the river regulation interventions, **due to the increase in shipping traffic**.

Mohács

It should be examined whether the works planned for the removal of the Mohács constriction and the technical interventions related to the revitalisation of the Mohács, Szabadság reef and its tributary, as provided for in the environmental permit No. 53-18/2010, have an impact on each other, and whether the construction of the diversion works planned and authorised above the Szabadság reef has a technical impact on the removal of the planned constriction.

Mohács-Szob

We consider it necessary to **carry out a model experiment on the Mohács-Szob section, taking into account the interventions of the whole section concerned, as** already mentioned. If this is not done, it cannot be ruled out that the low-water-level subsidence processes associated with the planned interventions could become superposed, with unforeseeable consequences for the recharge of coastal filtered water bodies and tributaries, and even a radical deterioration in navigation parameters.

Kovácspuszta-Siótorok

The negative impact of siltation behind the diversion works on the Gerjen-Dombor remote aquifer is mentioned in the documentation, but its expected extent and thickness are not described. There is also a lack of proposals on technical options to avoid or reduce the adverse effects to tolerable levels. The placement of the sediment only affects the southern end of the Gerjen-Dombori long-distance aquifer installation area, but its impact is not detailed in the documentation. The impact of the diversion works and the placement of the sediment is not addressed in any meaningful way.

The Fadd-Dombori-Bogyiszlo long-distance aquifer is located on three stretches of the Danube between sections 1502.75-1506.31 fkm. It has been considered as an alternative to the future water base of the city of Szekszárd, due to the vulnerability of the Lőter water base.

The supplementary documentation does not address the impacts on this important water body, despite the fact that it is downstream of the interventions in the channel associated with the Kovácspusztai gas horse.

Additions requested by the DD Inspectorate **Koppány-Baja, Mohács**

Are there any interventions and bank maintenance works planned on the Danube section in question, which **aim to stop or eliminate the process of low water level rise**? If so, please specify the exact location and technical description.

Whether the proposed activity affects a remote water body in their care. If yes, please indicate to what extent the planned interventions will affect the works related to the maintenance of the remote aquifers (monitoring studies).

Százhalombatta (Budapest Waterworks)

The planning area of the shipping route to be established in the Százhalombatta constriction affects the area of hydrogeological protection zone "B" of the Tököl-Szigetújfalu aquifer, therefore the planning and execution of the activity must take into account the relevant instructions of the Government Decree No. 123/1997 (VII. 18.) and its Annex 5. Despite the fact that the dredging activities detailed in the plan will take place in the right bank of the Sázný Halombatta constriction, which is outside the hydrogeological protection zone B assigned to the water body, the study must clearly demonstrate that the planned activity will not cause any damage to the water body concerned.

Budafok (Budapest Waterworks)

The planning area of the shipping route to be constructed at Budafok gas lake affects the area of the hydrogeological "B" protection zone of the Csepel-Halásztelek aquifer, therefore the planning and execution of the activity must take into account the relevant instructions of the Government Decree No. 123/1997 (18 July 1997) and its Annex 5.

We request that the possibility of the area under the 4th bottom rib to silt up be eliminated by appropriate engineering.

The impact assessment of the Csepel-Halásztelek project on the water table cannot be accepted based solely on the findings that the dredging will not affect the water table and that no reduction in yield is expected as a result of the works. **The expected impact should also take into account the expected siltation of the dead space behind the last downstream bottom bank, which is already in the hydrogeological protection area B of the aquifer.**

At the Budafok gas lake, the area between the bottom thresholds on the left bank of the Danube is also planned to be filled with dredged material. The intervention boundary of the material placement coincides with the boundary of the Csepel-Halásztelki aquifer Hydrological Protection Area B. The disposal of tens of thousands of cubic metres of dredged material in the riverbed cannot be carried out with cartographic precision, so it is unavoidable that it is not deposited in the protection zone of the affected aquifers. Therefore, please carry out the following tests for the disposal of dredged material in the above cases. (Explained at the bottom)

Árpád Bridge (Budapest Waterworks)

In the right and left branch of the Árpád-Híd constriction, we do not consent to the planned intervention in the riverbed and dredging in the protection area of the Margaret Island and Budaújlaki water basins for the following reasons:

- You have indicated the edge of the dredge on the submitted map with drawing number TM299-2.8-K-0-6 at the boundary between the outer and Hydrogeology "A". It is well known that the accuracy of river gravel dredges does not approach the accuracy of mapping. **Therefore, we request that the navigation route be modified so that dredging operations do not approach within 50 m of the outer protection area boundary.**
- According to the Environmental Impact Assessment, the dredging of the Árpád híd gas shaft will also affect the outer protection area of the Budaújlak aquifer. According to Annex 5 of Government Decree 123/1997 (18 July 1997), mining or other activities (including dredging) affecting the overburden or aquifer are **prohibited in the outer protection area**.

Visegrád (WWF)

The study does not analyse at all the impact of wave action from shipping traffic on coastal vegetation in the relatively narrow Visegrád breakthrough. How much damage is caused to juveniles and how coastal macroinvertebrates respond to increased vessel traffic.

(National Transport Authority)

The **construction works should be carried out simultaneously for the three gas locks and constrictions** (Dömösi constriction, Dömösi gas lock, Visegrád constriction), which **are geographically close to each other,** taking into account the coordination of the temporary waterway construction and vessel traffic control, as well as the hydraulic and hydrological interactions between the sites.

Váci, Sződligeti constrictions and Göd gas pond (KDVKÖVIZIG)

In a mathematical model including the main branch interventions of the Vác I-II-Göd section, **we asked to investigate the effects of the increase in water yield and water velocity resulting from the planned interventions on the water-sharing ratio between the Szentendre branch of the Danube and the Vác branch of the Danube, in** order to reduce the unfavourable processes (slow but gradual narrowing of the Szentendre branch) that have been observed in the last decade.

We also reported that **the planned "wildlife compensation island" at the Sződligeti constriction requires further consultation with the** Danube-Ipoly National Park Directorate and the designer. The planned solution, as a facility to be formed in the Danube riverbed from the bed material excavated during the main branch intervention, will pose stability problems due to the several metres of water cover resulting from the water forming the bed and higher water flows in the short time after installation, and is likely to drift away.

For the planned interventions in the Váci I-II constriction, the placement of the sediment was specified within the boundary of the combined Hydrology A and B protection areas of the Tótfalui aquifer. The disposal of tens of thousands of cubic metres of dredged material in the riverbed cannot be carried out with cartographic precision, so it is unavoidable that it is not placed in the protection zone of the affected aquifers. We therefore request that the following tests be carried out for the disposal of dredged material in the above cases. (Explained at the bottom).

8 Additional material proposed by WWF for review in 2011

- Background material for the TEN-T project

- European Parliament resolution of 22 April 2009 on the Green Paper on the future of the TEN-T network (2008/2218(INI)), (EP 2009)
- Joint Statement on Guiding Principles for the Development of Inland Navigation and Environmental Protection in the Danube River Basin, ICPDR, IC 127, 2007 (ICPDR 2007)
- Assessment of the restoration potential along the Danube and main tributaries, WWF DCP report 2010;
- Contributions to the financial assessment of the environmental damage caused by the development of the Danube for shipping, Harangozó 2010

- For the assessment of impacts on fish, we recommend that you consider the following literature:

- JURAJDA, P, ONDRACKOVÁ, M, REICHARD, M. (2004): Managed flooding as tool for supporting natural fish reproduction in man-made lenitic water bodies Fisheries Management and Ecology 11:237-242.
- KUTZERA-HIRZINGER, V, SCHLURERMANN, E, ZORNIG, H, WEISENBACHER, A, SCHABUSS, M,
- ERŐS, T, TÓTH, B, SEVCSIK, A. (2008): Fish assemblage and habitat use of fish species in the Danube littoral zone (1786-1665 fkm) - monitoring and conservation proposals. Fisheries 101:(3) 114-123.
- SCHIEMER, F. (2008): Potential effects of navigation-induced wave wash on the early life history stages of riverine fish Aquatic Sciences pp: 1-9.
- WOLTER, C, ARLINGHAUS, R. (2003): Navigation impacts on freshwater fish assemblage: the ecological relevance of swimming performance Reviews in Fish Biology and Fisheries 13: 63-89.
- WOLTER, C. (2001): Rapid changes of fish assemblages in artificial lowland waterways Limnologica 31: 27-35.
- WYSOCKY, L, E, DITTAMI, J, P, LADICH, F. (2006): Ship noise and cortisol secretion in European freshwater fishes Biological conservation 128: 501-508

- In parallel with and prior to the work of the Vituki-led Consortium, a number of expert papers were produced, which were generally ignored by the designers without much comment:
  - Environmentally friendly inland waterway ship design for the Danube river (Radojcic 2009) - an analysis of small-draft vessels on the Danube
  - Improvement of navigation parameters on the Danube river section 1811-1708 river kilometres... (Gerencsér 2009) - a parallel analysis on the Danube above Szob examined whether the navigation bottlenecks identified in the 2007 Vituki study could be eliminated by new setting methods. Proposals for improvements to fairway design were made;
  - Navigare necesse est ... or, the Danube like a highway (Tamás E.A. 2006);

Annex 5

DANUBE WATERWAY DEVELOPMENT PROGRAMME

The proposed system of evaluation criteria

September 2020

The proposed system of evaluation criteria

Criteria groups	Point scale		Component sub-criteria	The scoring system for each criterion
A) Technical, navigational aspects, manageability of extreme water management situations	**-5+30**			
A1) Ensuring compliance with the parameters and conditions set in the target	**-2+10**	***0+20***	Fairway Width	Aim to achieve the minimum width recommended by the Danube Commission (120 m) and a limited width (100 m) on forded sections
		0+10	Sailing time on the leg	Aim to meet the Danube Commission's recommendation on durability (25 dm, 343 days, water level at 94% water yield with 94% durability calculated from the data of the 30 years of ice-free period preceding the period under consideration). **0 = 0 multiplier, the condition is definitely not achievable, positive values can be adjusted depending on the certainty of achievement**
		-5+20	Hydraulics, flow conditions (flow directions, water speed)	The flow and velocity vectors of the 2D and 3D hydrodynamic model are used to evaluate and score the variants.
		-5+10	Increased safety of navigation (reduced risk of collisions, run aground)	Knowing the appropriate depth and width, as well as the bend radii, will help to assess the degree of navigational safety.
		-10+40	Rate of water level rise	The extent of the increase in water level due to the interventions is an important criterion for scoring. The more and over the longer stretch of water the variant increases the higher the score
A2) Risks during implementation and operation	**-1+5**	***-5+20***	**Impact on aquifers,** compliance with legal requirements	Non-compliance with legal requirements is a disqualifying factor, multiplier 0. The score is determined by the degree and extent of the potential for involvement.
		0+10	Complexity of implementation	The complexity of the implementation depends on the works used, their constructability on dry land or from water, and the dimensional tolerance of the works. It is also important that the construction can be carried out in or out of the waterway without disturbing navigation.
		-3+20,	Flood safety	It is essential that flood safety does not deteriorate.The Measured flood level must remain within +3 cm in all variants, which is still within the accuracy of the modelling.
		-2+20	Hydraulic conditions for ice discharge	Ice drainage can only be properly ensured if the interventions are as closely aligned as possible with the control line.
A3) Sustainability of the overall system	**-1+5**	***0+10***	Annual amount of maintenance age	The annual amount of maintenance dredging, the calculated intervention dredging, was determined. The less needed the higher the score.
		-5+20	Navigation, navigation aspects	The navigation and navigational aspects are favourable if the Danube Commission's fairway is prepared in accordance with the Commission's specifications, with occasional improvements to the bends. If a limited fairway width is applied, the score can be reduced in proportion to the number and length of the sections.
		-5+20	Operational safety considerations	Safety aspects can be scored in the same way as in the previous point.
A4) Smooth operation of the planned traffic growth	**0+2**	***0+10***	Ease of derivation of the traffic surplus considered	Based on the experience of boaters, we can estimate that the traffic increase taken into account in the design would be about three times the current one.
		0 +10	The possibility of improving and developing the system in place	The more carefully you develop the system, the more you can improve it and try to achieve the desired goal with as little intervention as possible.
A5) Compatibility	**-1+5**	***-5+10***	With related development plans (port development, ship park, etc.)	The interventions have been designed in coordination with the related plans and their consistency across the variants needs to be assessed.
		0+20	Compliance for river management	Compliance from a river management perspective can be assessed through the application of regulatory principles
		-5+15	The adaptability of the variant to local conditions, flexibility (water intakes, water inlets, uninterrupted operation of ferry crossings, sports clubs, fishing, beaches)	Disturbance of water intakes, water intakes, ferry crossings, sports clubs, fishing, beaches have been identified in the plan, and the adaptation of the variants to these can be assessed by scoring.
		0+5	Flexibility to choose the date of implementation	The flexibility in the timing of interventions depends largely on the quantity of interventions planned in the waterway and, in the wider waterway, on the quantity of interventions.
A6) Level of adaptation to expected climate change	**-1+3**	***-10+30***	According to the degree of water level rise.	The climate change study showed that a 5% decrease in water yield is expected by 2050, which could mean a drop of 8-9 cm in the water level at the Komárom and Esztergom gauges by that time. Therefore, the extent to which the intervention variants increase the water level is of great importance. A variant that would lead to a water level decrease cannot be proposed.
B) Economic, efficiency and land management issues	**-5+10**			
B1) Need for investment, one-off expenditure	**0 +2**	***0 +15***	B1/1) Investment, initial expenditure Ft, the higher the amount, the lower the score	Here, the investment cost counts and all one-off costs (e.g. dredging) related to the implementation of the projects should be distinguished between direct investment costs (construction, purchase of equipment) and additional costs (complex preparation, other investment e.g. project management, site preparation, land acquisition, inspection, public procurement). The higher the investment amount, the lower the positive score. **+ 15 = 0 variant costs, only IT, signage and other non-construction interventions.**
		0 +5	B1/2) Eligibility for funding	Expected availability of EU/national funding, co-financing. Chances of obtaining potential funding.
B2) Operating conditions	**0 +2**	***0 +8***	B2/1) Annual evolution of operating	Evolution of annual operating costs over 30 years in real terms. The maintenance costs should be given on an annual basis, taking into account the cycle time of each maintenance work. There are annual maintenance costs and periodic maintenance

Criteria groups	Point scale		Component sub-criteria	The scoring system for each criterion
			(running and maintenance) costs Estimate in Ft, taking into account maintenance cycle times	costs. The higher the annual running costs, the lower the positive score. **+8 = current cost level**
		0 +8	**B2/2) Financial viability and sustainability of operation**	The current level of funding (budgetary resources), expected available resources, expected deficits. The larger the deficit, the lower the positive score. **0 = Assumption of serious financing problems means a multiplier of 0.**
		0 +4	B2/3) Institutional, organisational, professional and qualification background of operation	Stability of beneficiary and operator organisations, availability of professionals, available operational resources. Identification of problems and possible solutions The fewer the problems, the higher the score. **+4 = operational conditions are in place and uninterrupted.**
B3 Aggregate size of costs, cost-effectiveness	**-1 +2**	***-5 +10***	B3/1) Present value of the sum of investment, non-recurrent expenditure and operating costs over a 30-year period.	In addition to the annual evolution of total investment and operating costs (investment can be multiannual), the present value (later efficiency calculation) requires a schedule of expected replacements. This requires the technical composition of the investment and the expected lifetime of each component. The higher the present value, the lower the score.
		-5 +10	B3/2) Cost-effectiveness, present value of costs per unit of turnover	The unit of traffic can be vessel number, tonnes of goods or other relevant data, which can be estimated by the technicians for each variant. Efficiency: present value of turnover/cost. The lower the efficiency, the lower the scores.
B4 Direct economic benefits (shipping, transport, GDP, etc.)	**0 +2**			Qualitative and possibly quantitative assessment of impacts. **0 = if no positive impact, +2 is the best option.**
B5) Indirect economic and social benefits	**0 +2**	***0 +4***	B5/1) Impact on water sports, fishing	Qualitative and possibly quantitative assessment of impacts. **0 = if no positive impact, +4 is the best option**.
		0 +4	B5/2) Impact on tourism	Qualitative and possibly quantitative assessment of impacts. **0 = if no positive impact, +4 is the best option**.
		0 +4	B5/3) Environmental benefits	Based on the summary assessment of environmental improvements, ecosystem services assessed in C-score (there is overlap)
		0 +4	B5/4) Employment benefits, contribution to the area's ability to support itself	Separately account for impacts during construction and operation. Qualitative and possibly quantitative assessment of impacts. **0 = if no positive impact, +4 is the best option.**
		0 +4	B5/5) Economic development benefits, possibility of creating new related development programmes	Economic benefits from the impacts of ancillary transport developments (e.g. shipyard, ports). **0 = if not expected, +4 = the option that makes the best use of the opportunities.**
B6) Indirect economic social damage	**-2 0**	***-10 0***	B6/1) Additional charges on the part of the persons concerned	Based on counting the additional expenditure (not necessarily in HUF). **0= if no additional expenditure, -10 = highest.**
		-10 0	B6/2Environmental damage	Based on a summary assessment of environmental degradation, ecosystem services assessed in C-score. **-10 = the most damaging option**
B7) Economic risks	**-2 0**	***-10 0***	B7/1) Changes in shipping demand/traffic (domestic, international) do not require intervention	Estimation based on available projections. **0= zero variant. The score is proportional to the costs and benefits foregone**
		-10 0	Impact on certain economic activities (e.g. Paks?)	Economic damage and additional expenditure likely to occur in other activities. **0 = none**
C) Protection of the environment, nature and landscape	**-25+15**			
C1) Size of the area affected by the intervention	**-2 0**	***-10 0***	Total area used for works (indirect and direct)	The area occupied by the project, its immediate area of influence, is easily defined - it is the same as the area of work. The given score is the total area occupied by the construction activity, which includes not only the actual area occupied by the interventions (excavations, structures), but also the areas where the machinery is parked, storage areas and material stockpiles. The larger the total area, the lower the score, the smaller the score, the higher the score. **0 = smallest extent, -10 = largest,** (The 0 variant does not require any land take, so it is 10 points.)
		-10 0	Dredging area (and area for disposal of dredged material)	As dredging has the greatest impact on the environment of all the different interventions, it is worth highlighting its extent in a separate section. The score is a function of the extent of the proposed dredging - the greater the extent of the dredging, the smaller the extent, the greater the extent. **0 = smallest extent, -10 = largest,** (Option 0 requires no land input, so is the 10 point score.)
C2) Difference in fairway width compared to the current situation	**0 +2**	***0+20***		**If the current width scores 0 points, the narrower version scores proportionally more.**
C3) Impact on aquifers	**-4 0**	***0 or 0 multiplier***	**c3/1 Dredging in the outer/inner protection zone of an operational aquifer**	According to Annex 5 of the Government Decree No. 123/1997 (VII. 18.) on the protection of aquifers, remote aquifers and water installations for drinking water supply, it must be taken into account in the planning that no excavation work (activities affecting the cover or aquifer) may be permitted in the inner and outer protection areas of the coastal filtered aquifers. If this criterion is not fulfilled for each intervention, the alternative is not feasible from the point of view of the protection of the aquifer**. 0 = unmanageable problem, 0 = no problem**
		-10 0	c3/2 Dredging [m²] in hydrogeological	Dredging is only permitted in the area of the A and B protection zones of the aquifers subject to the results of an

Criteria groups	Point scale		Component sub-criteria	The scoring system for each criterion
			protection area A/B of operating aquifer	environmental impact assessment or an individual study with the corresponding content. Although the clear legal prohibition of dredging applies only to the outer protection area, in order to avoid the risk of a subsequent impact assessment, significant overlapping (proposed: max. 25 %) of the small water body part of hydrogeological protection zones A and B should also be avoided. This score is determined by the extent of the impact of the overlapping part of the A/B protection zones on the small water bodies by examining each water body and selecting the one with the highest percentage of impact and scoring it on a scale of 0-10. **0 = no involvement, -1-= 0-1% involvement, -2= 1-4%, -3 = 4-7%, -4= 7-10%, -7=10-13%, -6=13-16%, -7=16-19%, -8=19-21%, -10=23% or more of total involvement**
		-10 0	c3/3 Maintain dredging in the protected area of (remote) aquifers	In the protection zone of remote aquifers, only maintenance dredging that does not substantially reduce the thickness of the gravel layer may be carried out. However, once a decision is taken to put the aquifer into operation, dredging should be stopped and the filter layer may be established during the period until the development is completed. Since it is preferable to use a solution that will not cause problems later, the scoring is based on the extent of maintenance dredging planned for the future aquifers. The score is determined according to the extent of the involvement of the overlapping small water bodies in the protective dykes of the remote aquifers by examining each aquifer and selecting the one with the highest percentage of involvement and scoring it on a scale of 0-10. **0 = no involvement, -1-= 0-1% involvement, -2= 1-4%, -3 = 4-7%, -4= 7-10%, -7=10-13%, -6=13-16%, -7=16-19%, -8=19-21%, -10=23% or more of total involvement**
		-10 0	c3/4 Sedimentation in the protection zone of an operating aquifer	In the vicinity of the spurs, chevron dams, bottom fins and guide vanes, the flow velocity is reduced due to the intervention. This is expected to result in the deposition of smaller particles compared to pre-intervention conditions. The sedimentation and accumulation of the sludge fraction in the riverbed poses a potential water quality risk, as studies on the sediment quality of the Danube show the presence of hazardous substances that can reach the bank-filtered wells when dissolved. A reduction in the capacity of the aquifer can only be envisaged in the event of increased scouring (formation of a thick, packed silt layer) over a significant part of the recharge bed. This is not expected, however, especially due to the loosening effect of tidal surges. The indicator used for the assessment is the proportion of the area within the catchment protection area where silt deposition is expected to occur during periods of significant navigation flooding as a result of the interventions. The sedimentation particle size and intensity are related to the mean velocity (vf) along the contour. Sedimentation is significant (moderate) if $0.0001 < vf \leq 0.005$ m/s and substantial (high) if $vf \leq 0.0001$ m/s. The impact associated with the intervention can be identified by the change being at least 0.0001 m/s, i.e. in the original state vf > 0.0051 m/s (significant sedimentation) or vf >0.0002 m/s (significant sedimentation). The velocities for the initial state and the different variations were provided by the BME 2D numerical model. The critical velocities were determined from the Hjulström diagram. The indicator refers to the navigation low flow and does not take into account that sediment discharged during the low flow period may be stirred up during higher flows. However, this neglect does not bias the results, given the persistence of low flow periods and the fact that measurements in the Danube after the 2013 surge in the JDS also indicated concentrations several times higher than the limit values. In terms of impact on aquifers, 4 categories are distinguished: significant (J) and considerable (S) deposition in the external or internal (K) and hydrogeological protection zone A or B (HB), respectively. Total exposure is the weighted average of the four categories with the following weights: KJ: 0,4, KSZ: 0,3, HBJ: 0,2, HBSZ: 0,1 The given score is determined according to the extent of involvement of the part of the outer/inner protective zone of the water bodies overlapping the small water body by examining each water body, selecting the one with the highest percentage of involvement and scoring it on a scale of 0 - -10 based on the level of risk indicated by the indicator. -10 is the score for the probable significant involvement of the water body, which is associated with a 5% value of the indicator, while the other variants are scored with a lower negative value proportional to the value of the indicator.
		-10 0	c3/5 Sinkhole in the protection zone of an operating aquifer	The flow conditions influenced by the structures may locally lead to higher velocities than currently occur. This will lead to washout, which will result in changes in the cover of the coastal filtered aquifer, and the continued flotation of the biochemically active layer will degrade the water quality efficiency of coastal filtration. In the event of significant leaching, the aquifer gravel layer itself may be damaged. The indicator refers to localised leaching associated with the structures, but not to the lowering of the water level associated with the subsidence of the bed, as the technical design conditions preclude in principle solutions with such effects. The indicator used for the assessment is the proportion of the area within the protection area of the water bodies where gravel washout is expected to occur during a significant navigation low flow event as a result of the interventions. The displaced grain size and intensity are related to the mean velocity (vf) along the contour. The sedimentation is significant (moderate) when $0.6 < vf \leq 1.5$ m/s and substantial (strong) when vf >1.5 m/s. The impact associated with the intervention can be identified by the change being at least 0.2 m/s, i.e. in the original state vf > 0.4 m/s (significant sedimentation) or vf >1.3 m/s (significant sedimentation). The velocities for the initial state and the different variations were provided by the BME 2D numerical model. The critical velocities were determined from the Hjulström diagram. The indicator refers to the navigation low water and does not take into account that the washout may be higher at higher flows, while the scoured sediment transported from the upstream section may fill the depressions. This effect cannot be assessed without detailed modelling studies. Four categories of impact on aquifers are distinguished: significant (J) and significant (SZ) leaching in the external or internal (K) and hydrogeological protection zones A or B (HB). The summed exposure is the weighted average of the four categories with the following weights: KJ: 0,4, KSZ: 0,3, HBJ: 0,2, HBSZ: 0,1. The given score is determined according to the degree of involvement of the part of the outer/inner protective zone of the catchment overlapping the small water body by examining each catchment and selecting the one with the highest proportion of involvement and scoring it on a scale of 0 to -10 based on the level of risk indicated by the indicator. A score of -10 is given

Criteria groups	Point scale		Component sub-criteria	The scoring system for each criterion
				to the likely significant involvement of the catchment, which is associated with a score of 20% of the indicator, while the other variants are scored with a lower negative score in proportion to the indicator score.
C4) Adverse environmental impacts of the deployment of the system	**-3 +1**	***-5 0***	c4/1) Air quality impacts and noise and vibration emissions from construction	Construction works, such as the extraction and disposal of sediment, the demolition of regulatory structures and the construction of new ones, generate air pollutants and noise and vibration emissions from the operation of machinery and associated transport. **0 = no impacts, - 7 = worst-case impacts**
		-3 0	c4/2) Causation, avoidability of water quality problems	The proposed development will cause adverse impacts on surface water quality primarily through changes in the condition of the riverbed and construction works locally. The extraction of sediment and the demolition of regulatory works and construction of new ones will also temporarily increase the suspended sediment content of the water. As a result of the disposal of excavated sediment, the sediment (sand and silt) already deposited at the bottom of the riverbed can be reintroduced into the water, which only locally and temporarily increases the suspended sediment content of the Danube water. During construction, accidental events may also occur which have temporary water quality consequences. **0 = no impacts to be assessed, - 3 = the highest probability of water quality problems among the options**
		-5 +10	**c4/3) Impacts on the hydromorphological conditions of the riverbed (e.g. risk of deepening of the riverbed, risk of water level reduction)**	From a hydromorphological point of view, the expected changes during construction can be considered in the context of the way the artificial stone works are constructed and the disturbance of the natural bed by the intervention in the bed and its temporary or long-term effects. In summary, any intervention that impairs or compromises the diversity of the natural conditions of the riverbed will have a negative impact on the hydromorphology of the Danube. The design of works that help to maintain diversity and ensure the navigational purpose with the least possible interference and use of artificial works has little adverse effect, and some measures, such as spur cuts, can have a positive effect on existing artificially regulated stretches. No clear scaling and scoring can be given for the effects on bed subsidence and water level changes and the actual change in bed morphology based on current studies, however, as the degree of regulation increases and although positive effects are expected, artificial works are still introduced into the riverbed, the effects are assumed to be negative.
		-3 0	c4/4) Impact of the dredging activity on the geological medium	Dredging activities can cause the erosion of the overburden, which can have a negative impact on water quality and the quantity of sediment. The score given is a function of the extent of the dredging planned - the greater the extent of dredging, the smaller the extent, the greater. **0 = smallest extent, -10 = largest,** (Variant 0 requires no land input, so is 10 points.)
		-2 0	c4/5) Problems and management of waste from construction works	Under the Waste Management Act, efforts must be made to minimise the amount of construction and demolition waste generated during the intervention. The reuse and recycling of the waste generated is an important aspect of the reconstruction and demolition of individual structures. The use of sludge and soil material resulting from the excavation of the riverbed should be managed at the intervention sites. Proper disposal of the waste generated should be ensured. **0 = the amount of waste generated is minimal and recycling is ensured, - 2 is the worst-case scenario**
		-3 0	c4/6) Disturbance of direct water uses	The construction activity itself may affect direct uses of the river such as fishing, water sports and navigation itself. This is related both to the land take of the works, their duration and their nature. Works affecting the fairway are more likely to disturb the navigation itself, while construction and demolition works closer to the shore are more likely to disturb users of these areas. **0 = no such impacts, - 5 is the worst case scenario in this respect**
		-3 0	c4/7) Summary of the effects on the settlement environment	This criterion is of a summary nature: it aggregates and thus weights the **adverse environmental impacts** [e.g. noise and air pollution caused by construction, traffic changes; (expected) changes in townscape and land use; impacts on cultural and historical values, impacts on municipal infrastructure (e.g. security of drinking water supply)] on **coastal and near-shore settlements. 0= no adverse environmental impacts, -3= impacts of the worst case scenario in this respect**
		-3 0	c4/8) Archaeological, cultural heritage, landscape impacts	The score is based on the expected impact on known archaeological sites, World Heritage sites, World Heritage candidate sites, monuments, local heritage sites, etc. at the current stage of planning. **0= no adverse environmental impacts, -3= worst-case impacts**
		-3 0	c4/9) Transboundary impacts	The development objective is of common interest with the neighbouring countries concerned. The question is whether there could be undesirable transboundary environmental impacts that could cause an appreciable problem for the other party. **0 = no such impacts, - 5 = worst-case impacts**
	-7 0	***-5 0***	c5/1) Affected protected natural area of national importance (extent of the direct and indirect impact of the variant on protected areas)	Interventions to improve navigability are essentially river management interventions. In protected natural areas of national importance, river regulation activities may be permitted without any size limitation, even on a very small scale, only subject to a prior assessment or, depending on the decision of the environmental authority in the prior assessment, subject to the outcome of an environmental impact assessment. This score is determined according to the extent of the overlapping area of the immediate construction and operational areas of the proposed interventions with the protected natural area of national importance. Total length of river sections in protected areas of national importance affected by the construction and operation: -5 points 30 km, -4 points 20-30 km, -3 points 10-20 km, -2 points 5-10 km, -1 point 1-5 km, 0 point 1 km >
		-5 0	c5/2/1) Natura 2000 site affected (extent of the direct and indirect effect of the variant on Natura 2000 sites)	This score is determined according to the extent of the overlapping Natura 2000 area of the direct construction and operational areas of the proposed interventions and the extent of the impact on the conservation status of the species and habitat types of Community importance on which the Natura 2000 site concerned was designated. Scoring: between 0 and -5: Total length of river sections in Natura 2000 habitat network affected by construction and operation area 5 points 100 km, -4 points 50-100 km, -3 points 20-50 km, -2 points 10-20 km, -1 point 5-10 km, 0 point 5 km >
		-10 0	C5/2/2) Expected impact on candidate	This score is determined according to the extent of the overlapping Natura 2000 area of the direct construction and operational areas of the proposed interventions and the extent of the impact on the conservation status of the species and

Criteria groups	Point scale		Component sub-criteria	The scoring system for each criterion
			species of Community importance during construction and operation	habitat types of Community importance on which the Natura 2000 site concerned was designated. Scoring: between 0 and -10: 3 or more candidate species of Community importance are likely to be significantly affected during construction or subsequent operation 1-2 candidate species of Community importance are likely to be significantly affected during construction or subsequent operation For 5 or more candidate species of Community importance, no significant but appreciable negative impact is expected during construction or subsequent operation For 3-4 candidate species of Community importance, no significant, but appreciable negative impacts are expected during construction or subsequent operation 1-2 candidate species of Community importance are not likely to have significant, but appreciable negative impacts during construction or subsequent operation No significant negative impact on any candidate species of Community importance is expected during construction or subsequent operation
		-5 0	C5/2/3) Expected impact on candidate habitat types of Community importance during construction and operation	This score is determined according to the extent of the overlapping Natura 2000 area of the direct construction and operational areas of the proposed interventions and the extent of the impact on the conservation status of the species and habitat types of Community importance on which the Natura 2000 site concerned was designated. Scoring: between 0 and -5: 3 or more candidate habitat types of Community importance are likely to be significantly affected during construction or subsequent operation 1-2 candidate habitat types of Community importance are likely to be significantly affected during construction or subsequent operation For 5 or more candidate habitat types of Community importance, no significant but appreciable negative impacts are expected during construction or subsequent operation For 3-4 candidate habitat types of Community importance, no significant, but appreciable negative impacts are expected during construction or subsequent operation No significant but significant negative impacts are expected during construction or subsequent operation for 1-2 candidate habitat types of Community importance No significant negative impacts on any candidate habitat type of Community importance are expected during construction or subsequent operation
		-10 0	c5/3 Number of other rare character species, number of species of special conservation concern and species of Community importance and the nature and extent of the expected impact on their populations	According to the provisions of the Nature Conservation Act, it is prohibited to endanger, destroy or damage without authorisation, endanger or damage the habitats of protected species and species under special protection. In addition, there are rare character species which, although not protected, are of considerable natural value because of their known populations and habitats. The score is determined on the basis of the number of protected, protected and non-protected rare species of conservation value that are negatively affected by the proposed interventions, the size of their populations adversely affected by the proposed interventions and their proportion of the total national population. Scoring: between 0 and -10. Expected impact on protected, specially protected and other rare character species during construction and operation 3 or more protected, specially protected and other rare character species, whose native distribution is mainly concentrated in the affected stretches of the Danube, are likely to be significantly affected during construction or subsequent operation 1 to 2 protected, specially protected and other rare character species, whose domestic distribution is mainly concentrated in the affected stretches of the Danube, are likely to be significantly affected during construction or subsequent operation 3 or more protected, specially protected and other rare character species, whose native distribution is mainly concentrated in the affected stretches of the Danube, are not expected to be significantly affected during construction or subsequent operation, but will be negatively affected 1-2 protected, specially protected and other rare character species, whose domestic distribution is mainly concentrated in the affected stretches of the Danube, are not expected to have significant but appreciable negative impacts during construction or subsequent operation 5 or more protected, specially protected and other rare character species for which the Danube stretches concerned do not play a unique role in the domestic distribution of the species are likely to be significantly affected during construction or subsequent operation 3 to 4 protected, specially protected and other rare character species, for which the Danube stretches concerned do not play a unique role in the domestic distribution, are expected to be significantly negatively affected during construction or subsequent operation 1 or 2 protected, specially protected and other rare character species for which the Danube stretches concerned do not play a unique role in the domestic distribution of the species are likely to be significantly affected during construction or subsequent operation 5 or more protected, specially protected and other rare character species for which no significant but appreciable negative

Criteria groups	Point scale		Component sub-criteria	The scoring system for each criterion
				impacts are expected during construction or subsequent operation, and for which the affected stretches of the Danube do not play a unique role in their domestic distribution Not significant for 3-4 protected, specially protected and other rare character species, but a significant negative impact is expected during construction or subsequent operation, for which the Danube sections concerned do not play a unique role in the domestic distribution of the species-1 Not significant for 1-2 protected, specially protected and other rare character species, but significant negative impacts are expected during construction or subsequent operation, for which the sections of the Danube concerned do not play a unique role in the domestic distribution0 No negative impacts are expected during construction or subsequent operation for any protected, specially protected and other rare character species
		-10 0	c5/4) Extent of habitat loss in the Danube river basin as aquatic habitat (expected extent of loss)	In the longer term, some of the river management interventions may lead to the recharge of part of the mid-water cross-section. This phenomenon can also be observed in many places along the Danube, especially at diversion works that extend all the way to the mid-water bed. As the successional process progresses, the recharged riverbeds become less and less durable and then become overgrown with forest, gradually losing their habitat functions for the aquatic fauna of the Danube. This score is determined according to the nature and extent of the medium and longer-term impacts of the proposed interventions on the wetted cross-section at medium and low water levels. Scoring: between 0 and -10. The planned interventions will result in the loss of the middle and small water bodies in the longer term due to filling during the operational phase. -10 points 180 ha, -9 points 160-180 ha, -8 points 140-160 ha, -7 points 120-140 ha, -6 points 100-120 ha, -5 points 80-100 ha-4 points 60-80 ha, -3 points 40-60 ha, -2 points 20-40 ha, -1 point 1-20 ha, 0 point <1 ha
		-6 0	c5/5) Nature and extent of the impact on the habitat diversity of the Danube river basin (can we say now?)	In general, habitats with higher diversity, greater small- and medium-scale heterogeneity and higher habitat-level diversity tend to provide suitable habitat for a more diverse, species-rich community. This general statement can also be applied to watercourses as habitats. Some of the river management interventions result in a more homogeneous and homogenous river section, which reduces the habitat diversity (the range of habitat types found with different substrate types and flow velocities) of the river section. This score is determined according to the direction and magnitude of the impact of the planned interventions on the habitat diversity of the river section concerned, taking into account the expected impact on the relative proportions of substrate types and the relative proportions of water body compartments with different water depths and flow velocities. Scoring: between 0 and -6. The dredging resp., percentage of the total surface area of the dredged section that is made more homogeneous by the regulatory works 6 points Long-term loss of habitat diversity due to significant dredging and significant quarrying -5 points Long-term loss of habitat diversity due to moderate dredging and significant quarrying - 3 points Long-term habitat level diversity loss due to significant dredging and moderate quarrying 2 points Long-term habitat level diversity loss due to moderate dredging and moderate quarrying 1 point Only minor habitat level diversity loss expected 0 point Negligible habitat level diversity loss expected
		-9 0	c5/6) Nature and magnitude of the impact on the ratio of artificial to natural soils (can we tell now?)	Based on the available survey results and field experience, in most cases, alien native and invasive species occur in the Danube in habitat patches characterised by artificial substrate types, with higher than average species and number of individuals. The spread of alien and invasive species is known to have a negative impact on the populations of native species in the Danube. Most of the river control works are constructed of hydraulic engineering stone, which can be considered as an artificial substrate type in the Danube. This score is determined on the basis of the direction and extent to which the planned interventions will affect the extent of the artificial substrate cover in the river section concerned. Scoring: between 0 and -9. Surface area of stone works resulting from the planned interventions -9 points 48 ha < , -8 points 42-48 ha, -7 points 36-42 ha -6 points 30-36 ha, -5 points 24-30 ha, -4 points 18-24 ha, -3 points 12-18 ha, -2 points 6-12 ha, -1 point 2-6 ha, 0 point <2 ha
		-10 0	c5/7) Nature and extent of the impact on the water balance of the Danube habitats (from tributaries to habitats further away from the Danube affected by the Danube water level)	One of the most striking consequences of river management interventions in Hungary over the last century and a half has been the process of shallowing of the bed of small water bodies, whereby the bottom level of the small water body has been lowered to a level lower and lower than the surrounding areas. During low flow periods, rivers typically drain the groundwater resources of surrounding areas at their current water level. As a result of low-flow river bed subsidence, rivers are draining groundwater from surrounding areas at increasingly lower levels, resulting in significant groundwater level declines in areas along their beds. Depending on the hydrological characteristics of the areas concerned, the magnitude of the long-range effects of groundwater level declines associated with low flow periods can be very significant. This is also the case along the domestic Danube section. Declining groundwater levels have a negative impact on the water balance of groundwater-dependent ecosystems in the affected areas, leading to water scarcity and consequent degradation of ecosystems.

Criteria groups	Point scale		Component sub-criteria	The scoring system for each criterion
				The score is determined on the basis of the direction and extent to which the planned interventions will affect the evolution of the small water table and the height of the bed above sea level in the river section concerned. Scoring: between 0 and -10. The extent to which the planned interventions will have a downward impact on the groundwater level in the areas draining the riverbed. -10 points very significant shallow water subsidence and therefore a significant impact on groundwater levels-8 points significant shallow water subsidence and therefore a significant impact on groundwater levels-6 points moderate shallow water subsidence and therefore a moderate impact on groundwater levels-4 points slight shallow subsidence of the bed and consequent reduction in groundwater level 2 points very slight shallow subsidence of the bed and consequent reduction in groundwater level 0 points no shallow subsidence of the bed and consequent reduction in groundwater level expected
		-5 0	c5/1) Affected protected natural area of national importance (extent of the direct and indirect impact of the variant on protected areas)	Interventions to improve navigability are essentially river management interventions. In protected natural areas of national importance, river regulation activities may be permitted without any size limitation, even on a very small scale, only subject to a prior assessment or, depending on the decision of the environmental authority in the prior assessment, subject to the outcome of an environmental impact assessment. The number of points will depend on the extent of the overlapping area of the immediate construction and operational areas of the proposed interventions with the protected natural area of national importance. Total length of the river sections in the protected site of national importance affected by the construction and operation area: -5 points 30 km < , -4 points 20-30 km, -3 points 10-20 km, -2 points 5-10 km, -1 point 1-5 km, 0 point 1 km >
C6) Environmental impacts due to traffic changes	**-2+4**	***-7 0***	c6/1) Consequences of emissions (air pollutants, noise) due to increased shipping traffic	During the operational period, the additional pressure along the shipping route (air pollutants, noise) is due to the increase in vessel traffic resulting from the development. **0 = status quo, - 7 worst case scenario**
		-3 0	c6/2) Changes in bank and shore erosion (increased traffic, decreased narrower fairway)	Constant wave action causes bank and shore erosion, and constant wave action can lead to the collapse of thick filter layers and the loss of stability of coastal defences. Wave action increases with increasing vessel traffic. The given score is a function of vessel traffic, the higher the vessel traffic the higher the anegative value, the lower the anegative value the lower the anegative value. **0 = current state**
		-5 0	c6/3) Possibility of landscape and land use changes due to the development of the entire water transport system	It is difficult to estimate the changes in landscape and landscape use caused by the interventions expected by the development of the entire water transport system. Aspects that can be examined at this stage of the planning process: which surface coverings, protected natural areas of national importance (in particular: landscape conservation area) are affected by the planned interventions, and the extent of overlap with the national landscape conservation area (in particular: in the case of installations above the water surface). **0= no change in the current situation or changes not related to interventions for navigability, -5= significant negative trends in areas with valuable natural landscape features**
		-5 +5	c6/4) Ecological impacts of vessel traffic (increased traffic increased, narrower waterway decreased)	Vessel-induced wave action near the shore leads to significantly increased near-bottom flow velocities and bottom-slip stresses, which can threaten the biota of the seabed. If bottom-slip stresses are sufficiently high, fish crustaceans, juveniles, macroinvertebrates and other benthic organisms on the seabed may drift away from the near-shore zone of safety to areas dominated by current velocities where their survival chances are close to zero. Vessels' engines and propellers can also damage the biota of a watercourse, and not only through mechanical impacts. These components emit extremely loud noise when they are in operation and can easily damage the senses and hearing of certain fish species, for example. The adverse effects are of course amplified in the case of species that rely primarily on their hearing to find their way around and to obtain food (predatory fish). The score is a function of the vessel traffic, the width of the fairway and the structures installed, and the score should be based on these three factors. **0 = current status**
		0 +15	c6/5) Total emissions reduction due to offsetting	Transport is a major source of air, noise and vibration pollution. Road transport is the most significant, with rail and waterborne transport playing a much smaller role. This means that a major shift from road to waterway reduces the overall emissions from the transport sector. The extent of this is also influenced by the rate of fleet modernisation. This and the following two effects are the main rationale and justification for the whole development. **0 = no such impact**
		0 +10	c6/6) Change in total transport energy demand	The energy demand of the transport sector is very high and is typically met by petroleum derivatives, which are currently subject to inelastic market conditions. A slowly changing, low energy-efficient and polluting vehicle fleet is an inherent problem. The energy demand of waterborne transport is, on average, about a third of that of road transport. Plans foresee a reduction in the overall energy use of the transport sector after 2020, which could amplify the positive effects of decarbonisation. **0 = no such effect,**
		0 +10	c6/7) Changes in land take resulting from congestion	The increase in traffic constantly requires the expansion of roads, especially motorways, which leads to significant land take and loss of green spaces. With the shift of traffic to waterways, this land take may be reduced. Especially if economic growth is not accompanied by a constant increase in transport demand, so that, unlike the previous two points, only major diversions can have a positive impact. **0 = no such effect**
C7) Environmental impacts on the	**-2 +3**	***-15 0***	c7/1) Effects of carrying out maintenance	The given score is a function of the extent of the planned dredging (more precisely 20% of the planned dredging) - the greater

Criteria groups	Point scale		Component sub-criteria	The scoring system for each criterion
operation of the waterway, maintenance of the new status, impacts of the existence of the new system.			dredging	the extent of the dredging, the lower the score, the smaller the extent, the higher the score. (Variant 0 requires no land take, so it scores 0.) **0 = no maintenance dredging, -15 = the variant with the highest dredging requirement**
		0 +10	c7/2) Opportunities for improved water supply to tributaries	Various interventions on tributaries (dredging, opening and widening of inlets and estuaries) can improve the water supply of tributaries, even during low flow periods. The score is given by the number of water supply improvement interventions per tributary. **0= No such intervention**
		0 +10	c7/3) Creation or potential creation of new wetland and aquatic habitats, potential for improvement of existing habitats potential compensatory measures	Areas disturbed by the intervention may lose their habitat function. To mitigate this impact, certain technical solutions can serve as habitat preservers. The inner, flow-protected parts of chevron dams are suitable for this function, and the score is given by the number of chevron dams to be installed. Scoring: between 0 and 10. Scoring according to the number of chevron dams to be installed: 10 points 35< units, 9 points 31-35 units, 8 points 26-30 units, 7 points 21-25 units, 6 points 16-20 units, 5 points 11-15 units, 4 points 8-10 units3 points 6-7 units, 2 points 3-5 units, 1 point 1-2 units, 0 point 0 units
		-5 +10	c7/4) Changes in the evolution of ecosystem services in the new state after the intervention	Ecosystem services are the goods and services of the living world that humans use directly or indirectly during their lives, and whose condition determines their quality of life. In our case, we are concerned with three basic types of services. Habitat regulating functions include climate control, flood mitigation, water purification and soil formation. (The cultural service function is not addressed, it is included under acceptability under D.) In this case, the extent and nature of the interventions are the basis for the assessment. We can take into account factors such as reproductive capacity, self-clearance, vegetation eradication, new habitats, etc. **0 = no change, compared to negative values indicating deterioration and positive values indicating improvement**. The effects of changes in turnover are not taken into account here.)
C8) Assessment under CCI 4.7	**-1+2**	***-5 +10***	**c8/1) The status of the affected water bodies is expected to be downgraded in the course of the WFD 4.7 analysis**	The hydromorphological status and biological status values should be given priority. This variant assessment should be preceded by a so-called applicability (screening) test of the VKI 4.7 assessment. It should be established whether there are any classification parameters that are likely to cause deterioration in any category. There may be an improvement compared to the current situation. **-5 = category deterioration, i.e. a multiplier of 0.**
		0 +5	c8/2) Whether appropriate mitigation measures have been applied	It is the responsibility of the technical designers to take account of potential mitigation measures and these should be identified in the description of the variants, in our case the development of the variants themselves also constitutes mitigation. **0 is the variant with no mitigation measures, +5 is the variant with significant mitigation measures**
		-5 +5	**c8/3) Threatening or supporting the achievement of the objectives set for the water bodies concerned**	It should be determined whether the measures in VGT2 are impeded or supported by the project variant; if the impediment to the objectives is significant, the variant should be excluded. **0 = no effect, -5 = existence of significant barrier, 0 multiplier, +5 = existence of significant supporting effect**
C9) Environmental risks during the operation of the established fairway	**-2 0**	***-5 0***	c9/1) Changes in the risk of shipping accidents due to traffic growth and the new fairway	Inland waterway transport has accident rates that are orders of magnitude better than all modes of transport.However, increased traffic and narrower shipping lanes also increase the potential for accidents, which can lead to the release of pollutants, mainly petroleum derivatives and hazardous substances carried by ships, into living water and aquifers. Since the risk of accidents is difficult to estimate, we calculate the increase in the potential for danger, in this case the number of locations where ships are more likely to encounter each other, and thus the extent to which fairway narrowings are applied gives the score. **0 = No points considered dangerous, -5 = Worst alternative in this respect**
		-5 0	c9/2) Dredging risks	The given score is a function of the extent of the planned dredging (more precisely 20% of the planned dredging) - the greater the extent of the dredging, the lower the score, the smaller the extent, the higher the score. **0 = smallest extent, -5 = largest**, (Variant 0 requires no land input, so is a score of 0.)
		-5 0	c9/3) Increased likelihood of water quality incidents (e.g. ship discharges)	The change in surface water quality impacts associated with water transport development is mainly due to the increased number of vessels. In terms of water quality, pollution from accidents and water pollution related to shipping itself, e.g. hydrocarbon pollution related to ballast water, bottom water discharge, etc., can be highlighted. The score is partly determined by the difference between the increase in traffic and the risk of accidents. **0 = current situation**
		-5 0	c9/4) Development of critical local air quality situations	The occurrence, frequency or severity of localised critical situations in certain locations as a consequence of air pollutant emissions from increased shipping traffic. **0 = current situation, - 5 is the worst case scenario**
C10) Climate risk	**-2+3**	***-4 +5***	c10/1) Impact of changes in shipping traffic on GHG emissions from waterborne transport	If the investment is completed, Danube shipping traffic will increase, which will also lead to an increase in GHG emissions. We score each option according to the increase in shipping traffic and hence GHG emissions. For the scoring, the GHG emissions are indicated. Depending on the composition of traffic, the increase in emissions due to increased traffic can be partly compensated by the spread of more modern, energy-efficient ships (forced by stricter environmental requirements), which is why the scoring range is +5, which is a positive effect.
		0 +20	c10/2) Impact of shifting road transport services to shipping on total GHG emissions from transport	If the investment target is met, Danube shipping traffic will increase and transport services are expected to shift to shipping, which has lower GHG emissions. The scoring of this option is based on the extent to which road transport services are shifted to shipping, and the scoring scale is therefore positive (0-20).
		-4 0	c10/3) To what extent can the navigation conditions be ensured for a 1 -7% reduction in water yield according to the	According to the results of the long-range modelling of water yields, a reduction in water yield of 1-7% is expected in the 11 sections under consideration for the period 2020-2050. The alternative is scored according to the extent to which navigation conditions can be ensured under the future changes in water yield. For this reason, a range of scores from 0 to -4 is given.

Criteria groups	Point scale		Component sub-criteria	The scoring system for each criterion
			model simulation results?	
		-4 0	c10/4) To what extent can navigation conditions be ensured in the event of variable weather conditions expected as a result of climate change?	The analysis so far suggests that the planned investment Danube section will experience more extreme water flows. We score each alternative according to the extent to which navigation conditions can be ensured under the extreme water conditions expected in the future. For this reason, a range of scores from 0 to -4 can be given.
		-3 +2	c10/5) Consideration of adaptation measures to climate change	The ICPDR Adaptation Strategy and the guidelines of the second National Climate Change Strategy provide guidance for the climate change assessment of each option. A variant is scored according to the extent to which any adaptation action has been taken into account, hence the range of scores from -3 to +2.
		-2 0	c10/6) Degree of vulnerability of technical solutions to climate change	Vulnerability shows the likelihood that the impacts of climate change will cause significant damage to the implemented facility for each variant, and it can also be used to compare which of the variants is best suited to mitigate and manage the impacts. In the study, the vulnerability of each technical solution is evaluated and scored for each variant in relation to each other in the future. This is why the scoring range is from 0 to -2.
		-3 + 3	c10/7) Change in the extent of CO_2 sequestering, bioactive surfaces	If the project will lead to a reduction in algal biomass (due to climate change and human interventions), which is clearly negative in terms of CO2 sequestration, the alternative is scored according to the expected reduction in algal biomass and the expected reduction in plant eradication, and is therefore scored from -3 to +3.
D) Social and acceptability issues	**-5+5**			
D1) Acceptability to data subjects	**-2+1**	*-10 +5*	d1/1) Acceptability for angling	Qualitative and possibly quantitative assessment of impacts, consultation with stakeholders, **-10 = unacceptable, +5 if acceptable without change.**
		-10 +5	d1/2) Acceptability for water sports	Qualitative and possibly quantitative assessment of impacts, consultation with stakeholders, **-10 = unacceptable, +5 if acceptable without change.**
D2) Compliance with the preferences of the relevant water management organisations, the National Park and the relevant Authorities	**-3+3**	*-10 +10*	d2/1) Expected reception in the National Park	Consultation with stakeholders to assess acceptability or ask them for a direct assessment. **highest negative value = unacceptable option, so 0 multiplier, highest negative value = acceptable without change.** Exclusionary judgement by any stakeholder, may exclude the variant if it is not modified.
		-10 +10	**d2/2) Acceptability for operators**	
		-5 +5	**d2/3) Expected reception by water protection and environmental authorities**	
		-5 +5	d2/4) Professional judgement in shipping, transport	
D3) Employment effects	**0+1**	*0 +10*		Estimation of expected employment-enhancing effects, taking into account, for example, maintenance tasks or traffic growth effects. **0 = no effect, +10 if there is a direct and indirect employment effect of significant magnitude.**
Total	**-40+60**			

Annex 6

DANUBE WATERWAY DEVELOPMENT PROGRAMME

The scoring tables

September 2020

A) Phase I: Environmental assessment of the alternatives between Szap and Szob (orange exclusion type criteria)

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III/A. var.	Evaluation
A) Technical, navigational aspects, manageability of extreme water management situations	**-5+30**			**8**	**20,3**	**23,4**	**24,9**	**25,8**	
A1) Ensuring compliance with the parameters and conditions set in the target	**-2+10**	***0+20***	A1/1) Fairway Width	**10**	**20**	**18**	**18**	**15**	In Variant I, the fairway width is 120 m everywhere. In Variant II and Variant III, a limited width is foreseen on one section each, while in Variant III/A, several sections with limited width are foreseen.
		0+10	A1/2) Sailing time on the section	**0** multiplier	**9**	**8**	**8**	**6**	The navigation time on this stretch is roughly related to the width of the fairway. It is longest in variant III/A with several sections of limited width.
		-5+20	A1/3) Hydraulic, flow conditions (flow directions, water speed)	**5**	**10**	**15**	**18**	**18**	The flow and velocity conditions have evolved in line with the design concept, i.e. they have improved from version to version. They have not changed in version III/A
		-5+10	A1/4) Increased safety of navigation (reduced risk of collisions, run aground)	**5**	**6**	**8**	**10**	**9**	Navigation safety increases in proportion to the improvement in flow and speed conditions.
		-10+40	A1/5) Rate of water level rise	**0**	**35**	**40**	**30**	**32**	The rate of increase in water level is most favourable in Option II. In variants III and III/A, although slightly lower than in the previous two, it is still satisfactorily high.
A2) Risks during implementation and operation	**-1+5**	***-5+20***	A2/1) Impact on aquifers, compliance with legal requirements	**20**	**10**	**15**	**15**	**18**	The impact on water bodies is inversely proportional to the width of the waterway. The less wide the fairway, the less affected the water body.
		0+10	A2/2) Complexity of implementation	**0**	**6**	**3**	**7**	**8**	The complexity of implementation increases with the scale of the planned interventions in the fairway and the amount of specialised stone works (chevron dams) used
		-3+20	A2/3) Flood safety	**5**	**10**	**5**	**15**	**15**	Flood safety decreases with the increase in the number of control works, but increases with their height setback.
		-2+20	A2/4) Hydraulic conditions for ice discharge	**5**	**10**	**15**	**15**	**14**	Ice-discharge conditions are generally improved by the development of a uniform bed, but are also to some extent related to the parameters of the bed width, sinuosity
A3) Sustainability of the overall system	**-1+5**	***0+10***	A3/1) Annual amount of maintenance dredging	**0**	**3**	**6**	**8**	**10**	The most favourable option is the one with the least dredging.
		-5+20	A3/2) Navigation, navigation aspects	**5**	**12**	**16**	**20**	**18**	Navigation and navigation aspects are improved as flow and speed conditions improve
		-5+20	A3/3) Safety aspects	**5**	**10**	**12**	**15**	**14**	Operational safety is related to the flow and speed conditions, fairway width and cornering parameters
A4) Smooth management of the planned traffic growth	**0+2**	***0 +20***	The possibility of improving and developing the system in place	**0**	**10**	**10**	**15**	**20**	The system can only be improved if the implemented version achieves its goal with as little intervention as possible
A5) Compatibility	**-1+5**	***-5+10***	A5/1) With related development plans (port development, ship park, etc.)	**0**	**5**	**8**	**9**	**10**	Option III/A is the most consistent with the related development plans
		0+20	A5/2) Compliance for river management	**5**	**15**	**20**	**15**	**14**	River management is more favourable when water levels and flow conditions are favourable, when the riverbed is as uniform as possible.
		-5+15	A5/3) Adaptability of the variant, adaptability to local conditions, flexibility	**15**	**10**	**10**	**13**	**15**	Adaptation to local conditions has included adapting to the needs of angling and sporting clubs in terms of water outlets, water intakes, ferry crossings
		0+5	A5/4) Flexibility to choose the date of implementation	**0**	**2**	**0**	**3**	**5**	The flexibility in the timing of implementation increases in proportion to the reduction in the volume of interventions required, minimising interventions in the fairway.
A6) Level of adaptive capacity to expected climate change	**-1+3**	***-10+30***	According to the degree of water level rise.	**0**	**20**	**25**	**15**	**16**	The level of resilience to expected climate change is proportional to the levelling capacity of the variant. J8
B) Economic, efficiency and land management issues	**-5+10**			**0,6**	**1**	**0,4**	**2,8**	**3**	
B1) Need for investment, one-off expenditure	**0 +2**	***0 +15***	B1/1) Investment, initial expenditure Ft, the higher the amount, the lower the score	**x**	**6**	**3**	**8**	**8**	Option 0 has no investment cost. Option II focuses mainly on the construction of the chevron dam, and is therefore the most expensive option, at HUF 10.9 billion. Option I is 24 % cheaper at HUF 8.3 billion, while the difference between Option III (HUF 7.4 billion) and Option III/A (HUF 7.3 billion) is minimal and they therefore score the same.
		0 +5	B1/2) Eligibility for funding	**x**	**2**	**1**	**3**	**3**	The lower the costs, the more realistic the affordability
B2) Operating conditions	**0 +2**	***0 +8***	B2/1) Annual evolution of operating (running and maintenance) costs Estimate in Ft, taking into account maintenance cycle times	**8**	**2**	**4**	**4**	**5**	Version 0 includes not only the actual current costs, but also the minimum IT, setting and annual dredging costs needed to ensure the expected operational standard of 220 MFt/year. Option I is the most expensive option due to the significant dredging volume, with a total operating cost of €286Mt. Option III/A is 19% cheaper at 231 M€, with a minimal difference between Option II (246 M€) and Option III (242 M€), which therefore score the same.
		0 +8	B2/2) Financial viability and sustainability of operation	**6**	**2**	**4**	**4**	**5**	The lower the costs, the more realistic the affordability. If we look at it proportionally, option 0 would score 8 points, but here we have also taken into account that a good part of the necessary work is not being done at the moment, so some kind of funding problem will arise.
		0 +4	B2/3) Institutional, organisational, professional and qualification background of operation	**2**	**2**	**2**	**2**	**2**	It's the same everywhere, because it takes several specialists to run each version.
B3) Total cost, cost-effectiveness	**-1 +2**	***-5 +10***	B3/1) Present value of the sum of investment, non-recurrent expenditure and operating costs over a 20-year period.	**x**	**2**	**0**	**4**	**4**	The score for variant 0 is not meaningful, because we calculate a development margin in the variant analysis. The present value of Option II is the highest at HUF 10.4 bn. The difference between Variant I is 19% lower, at HUF 8.5 bn, and Variant III (HUF 7.2 bn) and Variant III/A (HUF 6.9 bn) is minimal, so they have the same score.

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		-5 +10	B3/2) Cost-effectiveness, present value of costs per unit of turnover	x	2	0	4	4	Efficiency indicator projection based on expected turnover. All variants can meet the projected traffic growth. Therefore the order of efficiency is the same as the order of the present value of costs.
B4) Direct economic benefits (shipping, transport, GDP, etc.)	0 +2		B4) Direct economic benefits	x	2	2	2	2	The direct economic benefit is proportional to the increase in turnover, which is assumed to be the same for all variants.
B5) Indirect economic and social benefits	0 +2	*0 +4*	B5/1) Impact on water sports, fishing	0	0	0	0	0	Water sports and fishing are not expected to be positively affected. The users of fisheries water areas cannot expect to benefit from improved navigability and increased boat traffic (with appropriate compensatory measures, fishing tourism attraction and thus sales of area fishing tickets and ancillary services can be increased)
		0 +4	B5/2) Impact on tourism	2	1	1	2	2	There are both negative and positive effects. Positive in terms of tourist cruising, negative in terms of potential landscape degradation
		0 +4	B5/3) Environmental benefits	0	2	3	4	4	Transfer from public transport and other environmental benefits. If traffic growth is the same, then these benefits are the same. Each intervention includes measures to improve the environment, but these vary from alternative to alternative.
		0 +4	B5/4) Employment benefits, contribution to the area's ability to support itself	0	3	4	2	1	Construction employment effects are temporary, permanent employment effects are the additional number of people operating, the higher the costs, the higher the employment benefits
		0 +4	B5/5) Economic development benefits, possibility of creating new related development programmes	0	2	3	2	2	Construction for realization the more expensive the investment, the higher the construction demand growth. If traffic is the same across the variants, then the scale of port construction, the combined transport development demand is the same. For variant III/A, the ports have to stand the most, so some additional port development is needed here.
B6) Indirect economic social damage	-2 0	*-10 0*	B6/1) Additional charges on the part of the persons concerned	-10	-3	-3	-4	-5	Impact on shipping businesses Inversely proportional to water depth, passage time), so the environmentally worst is the best economically
		-10 0	B6/2Environmental damage	x	-7	-10	-3	-1	in proportion to the potential degradation of ecosystem services.
B7) Economic risks	-2 0	*-10 0*	B7/1) Changes in shipping demand/traffic (domestic, international) do not require intervention	0	-8	-10	-6	-6	The higher the costs, the higher the economic risk
		-10 0	B7/2 Impact on certain economic activities	-2	0	0	0	0	It is not relevant for development options in this section, but the persistence of public access constraints poses some risk to development options.
C) Protection of the environment, nature and landscape	-25+15			0	-9,3	-7,2	-5	-3,6	
C1) Size of the area affected by the intervention	-2 0	*-10 0*	C1/1) Total area used for works (direct and indirect)	0	-9	-10	-9	-8	Although there are differences in terms of land occupation between the different options, given that no significant maintenance work (neither dredging nor construction or demolition of masonry) is currently carried out on the section under study, apart from a few isolated sites, all intervention concepts could result in significant differences compared to the zero option. In the context of the project, the waterway was designed with narrowings in Option III/A in order to reduce the amount of work to be carried out in the riverbed, and therefore Option III/A is the preferred option based on our analysis. Variations III and I have slightly more interventions, while Variation II has significantly more interventions, and is therefore the least favourable from an occupancy point of view.
		-10 0	C1/2) Dredging area (and area for disposal of dredged material)	0	-10	-9	-9	-8	Dredging is included in the variation assessment in several aspects, because this type of intervention has the most significant direct impact, in terms of habitat protection, aquifer protection, soil protection, hydromorphology and, indirectly, in many other environmental disciplines. In terms of its impact, it is the surface area of the work in the riverbed rather than its volume that matters. After the zero option, in which no dredging is considered, Option III/A, which envisages the most narrowed fairway, has the least surface area dredged and is therefore the most favourable, while Option I requires significantly more dredging and is therefore the least favourable.
C2) Difference in fairway width compared to the current situation	0 +2	*0+20*	C2) Difference in fairway width compared to the current situation	0	15	18	18	20	Compared to the current fairway designation, all the intervention options foresee a narrower fairway on the stretch between 1791-1708 fkm (120 m width instead of 150 m), which is beneficial from an environmental (noise, habitat, social, ecosystem services) point of view. The most favourable option is Option III/A with minimum width, followed by Options II and III, which are considered to be of equal width, and then Option I.
C3) Impact on aquifers	-4 0	***0 or 0 multiplier***	c3/1 Dredging in the outer/inner protection zone of an operational aquifer	0	0	0	0	0	No dredging is planned in the outer or inner protection area of an operating aquifer in any of the intervention options, so no distinction can be made between the options in this respect.
		-10 0	c3/2 Dredging [m^2] in hydrogeological protection area A/B of operating aquifer	0	-1	-1	-1	-1	Considering that all variants except variant 0 foresee the same amount of bed excavation in the hydrogeological A/B protection area of the aquifer, no difference can be made between the variants. Since the impact is below 1% for all aquifers, a minimum score is given to all variants except 0.
		-10 0	c3/3 Maintain dredging in the protection zone of (remote) aquifers	0	-1	-1	-1	-1	The dredging volumes required to provide the depth of the fairway cannot be accurately predicted at this stage of the design because the extent of the dredging is a function of a number of future shaping effects, which can be inaccurately predicted. However, even if a 20% annual maintenance dredging rate, estimated on the basis of design experience with the fairway, is assumed, no difference can be made between the variants, as all variants have the same minimum dredging rate (less than 1%) planned for the distant water protection area.
		-10 0	c3/4 Sedimentation in the protection zone of an operating aquifer	0	0	0	0	0	Based on the model calculations carried out, no significant sedimentation of sediment is expected in the outer or inner protection zone of the operating aquifer.
		-10 0	c3/5 Sinkhole in the protection zone of an operating aquifer	0	0	0	0	0	Based on the model calculations carried out, no significant sedimentation is expected in the outer or inner protection zone of the operating aquifer.
C4) Adverse environmental impacts of the deployment of the system	-3 +1	*-5 0*	c4/1) Impact of deposition on air quality and noise and vibration emissions	0	-4	-5	-3	-2	The interventions planned in each variant involving the operation of machinery were taken into account. In addition to the total amount of work in each case, we have also tried to take into account the differences in the planned locations. As a starting point, the potential impact on residential areas within a 500 m radius was assessed. Variations involving a greater volume of work or interventions involving work near more populated areas were given lower scores. The worst option in this respect (Option II) received the lowest score (-5), compared to the other options.
		-3 0	c4/2) Causation, avoidability of water	0	-2	-3	-2	-1	Any construction work in a riverbed during construction has the potential to cause water quality problems, so the extent of

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		quality problems						this is determined by the extent of the area of construction activity in the riverbed. As a result of the analysis, it was concluded that III/A is the most favourable option. Options I and III are the least favourable, while Option II is the least favourable.
	-5 +10	c4/3) Impacts on the hydromorphological conditions of the riverbed (e.g. risk of deepening of the riverbed, risk of water level reduction)	**0**	**-2**	**-3**	**-1**	**-1**	From a hydromorphological point of view, the expected changes during construction can be considered in the context of the way the artificial stone works are constructed and the disturbance of the natural bed by the intervention in the bed and its temporary or long-term effects. In summary, any intervention that impairs or compromises the diversity of the natural conditions of the riverbed will have a negative impact on the hydromorphology of the Danube. The design of works that help to maintain diversity and ensure the navigational purpose with the least possible interference and use of artificial works has little adverse effect, and some measures, such as spur cuts, can have a positive effect on existing artificially regulated stretches. The most favourable options are III and III/A, which are equivalent, followed by I and finally II. No clear scaling and scoring can be given on the basis of the current studies for the effects on the channel deepening and water level changes and the actual channel morphology, however, as the degree of regulation increases and although positive effects are expected, artificial works are introduced into the channel, the effects are assumed to be rather negative.
	-3 0	c4/4) Impact of the dredging activity on the geological medium	**0**	**-3**	**-2**	**-2**	**-1**	The most favourable variants are 3 and 3a, which are equivalent, followed by 1 and finally 2.
	-2 0	c4/5) Problems and management of waste from construction works	**0**	**-2**	**-2**	**-1**	**-1**	Existing data do not include information on the amount of waste generated during construction works. The only way to distinguish between the different options is to assume that the option that involves more material handling, construction, reconstruction or demolition of more river control features generates more waste. The excavated sediment is not considered waste because it is deposited in its original environment, the river. Furthermore, the aim is that the material left over from the dismantled hydraulic structures will be used in the construction process. Option II is where most material handling takes place (559 thousand m^3). Variant I has 515 thousand m^3, Variant III 441 thousand m^3 and Variant III.a 431 thousand m^3.
	-3 0	c4/6) Disturbance of direct water uses	**0**	**-2**	**-3**	**-1**	**-1**	The disruptive impact of construction activity is related to both the land use, duration and nature of the works. Works affecting the shipping lane are more likely to disturb navigation itself, while construction and demolition works closer to the shore are more likely to disturb those using the areas. The area affected is known. Time is another important factor. This may in theory be related to the amount of work required for the variations, but also depends on, for example, how many sections are worked on at the same time.
	-3 0	c4/7) Summary of the effects on the settlement environment	**0**	**-1**	**-2**	**-1**	**-1**	The negative impacts are partly linked to specific construction activities (thus affecting coastal settlements) and partly due to the expected increase in shipping traffic. There are 4 settlements (including residential and recreational areas) in the study area where interventions are planned in the vicinity: Nagybajcs, Gönyű, Nyergesújfalu and Esztergom, but for all technical variants these settlements are affected by the negative environmental impacts of the construction, as well as by the expected increase in vessel traffic. A distinction can only be made on the basis of the scale of the interventions (e.g. dredging, total volume of stone moved). Gas dredging is the largest in Option I and the total volume of stone moved is the largest in Option II. For the coastal settlements mentioned, this is the case for the territorial coverage: In the case of Nagybajcs, interventions are planned for variants II, III and III/A. For Gönyű, Option I is the most favourable, for the others there is no significant difference. The northern part of Nyergesújfalu is affected in all variants. In the case of Esztergom, Option I is also the most favourable, in Option II Esztergom-Szamárhegy, and in Options III and III/A, the part of Szentgyörgymező will also be affected. In addition to the spatial distribution, it is also important to consider the scale of the interventions, as individual settlements may be indirectly affected by the impacts of construction (e.g. transport, disturbance from material loading). In this respect, Option I is the least favourable and Options III and III/A the most favourable. Overall, there is no difference between variants I, III and III/A in terms of spatial location and scale, with variant II being slightly less favourable than the others.
	-3 0	c4/8) Archaeological and cultural heritage impacts	**0**	**-3**	**-3**	**-2**	**-2**	From an archaeological point of view, there are 3 critical priority sites along the whole of the national Danube section, of which one, the 1785 fkm section, is located on the Sap-Sob section. For the 1785 fkm section, the three variants are planned to intervene in the same way, and no reason for exclusion has been identified. In a further 9 sites, the interventions could be hazardous. In terms of archaeological values, the excavation of the riverbed poses the greatest risk in terms of the impact on archaeological remains in the riverbed. Dredging a critical site would be a high risk and would therefore be considered as zero, no such case exists in Phase I. Variants for critical sites are the same, here in all variants the demolition of an existing guideway is planned, in consultation with the archaeologist this is not an exclusion. In terms of other cultural heritage protection, only one monument site is affected in all variants, as the monument is located in the Danube bed (Esztergom, coal loading tower), but the monument itself is not threatened by the planned interventions in the main Danube bed. In the case of World Heritage sites, the Roman Limes are concerned. No specific assessment is required in this respect, as it overlaps with archaeological sites. No protected sites of local importance are likely to be affected by either option.
	-3 0	c4/9) Transboundary impacts	**0**	**0**	**0**	**0**	**0**	For transboundary impacts, it is necessary to consider both the period of implementation of the interventions and the period of increased navigation opportunities, and the impacts will be largely determined by the extent of the impact area and the magnitude of traffic changes. It is therefore proposed that these two aspects are given equal weight in the transboundary assessment of the analysis of variation. However, due to the Hungarian-Slovak joint plan and implementation, it is meaningless to speak of such an effect here, so no such effect is present in our case.
C5) Conservation impacts during construction and maintenance	**-7 0**	***-5 0***	c5/1) Affected protected natural area of national importance (extent of the direct and indirect impact of the variant on protected areas)	**0**	**-4**	**-4**	**-4**	**-4**	There is no appreciable difference between the variants studied in terms of the impact on the protected natural area of national importance, as all variants affect the same fords and reefs, but the type and volume of intervention differs. In particular, the assessment of the impact on the construction interface was -2 for all variants. The operational scope was scored -5 for all variants, as the increase in navigation volume assumed during the operational phase after the development will affect the whole section and its wildlife. The final assessment was made by averaging the scores of the construction and operational phases, rounded upwards as only integer values can be given. This resulted in a score of -4.
		-5 0	c5/2/1) Natura 2000 site affected (extent of the direct and indirect effect of the variant on Natura 2000 sites)	**0**	**-4**	**-4**	**-4**	**-4**	In terms of the Natura 2000 area affected, there is no appreciable difference between the variants studied, as all variants affect the same river sections that hinder navigation in low water periods, only the way and the volume of the intervention differ. In particular, the assessment of the impact on the construction impact area was -3 for all variants. The operational reach was scored -5 for all variants, as the increase in navigation volume assumed during operation following development will affect the entire stretch and its wildlife. The final assessment was based on the average of the scores for the construction and operational phases. This resulted in a score of -4.

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		-10 0	C5/2/2) Expected impact on candidate species of Community importance during construction and operation	**0**	**-10**	**-8**	**-6**	**-6**	There are significant differences between the variants in terms of the impact on the candidate animal and plant species of Community importance. The assessment typically takes into account the negative impacts associated with the construction, or the impacts on hydromorphological conditions and hence on organisms relevant to the operational phase associated with the construction, and does not weigh the impacts of increased vessel traffic. The increase in traffic may occur in the operational phase as an effect independent of the variation (e.g. determined by economic factors) and, if a significant increase in traffic were assumed, the differences between the variations, independent of traffic but otherwise real, would be completely masked. In terms of this sub-criterion, Option I clearly scores the lowest (-10 points), providing the required width for the entire length of the fairway using conventional control works. In contrast, the least unfavourable scores were given to options III and III/a, which include fairway narrowing to minimise dredging interventions and use chevron dike type diversion structures instead of conventional diversion structures, which are expected to have a more favourable impact on wildlife conservation after construction.
		-5 0	C5/2/3) Expected impact on candidate habitat types of Community importance during construction and operation	**0**	**-5**	**-5**	**-4**	**-4**	In all three variants, dredging of the interspersed areas between Szap and Gönyű in the main branch is included, which, in addition to the softwood forests, will affect the reef vegetation with oligo-mesotrophic stagnant water Littorelletea uniflorae and/or Isoeto-Nanojuncetea vegetation (3130), a habitat type of Community importance. The proposed intertidal dredging will result in a significant reduction in the proportion of reef surfaces suitable for this type of habitat during the low water period within the affected Priority Nature Conservation Area of the Szigetköz (HUFH30004). All three proposed options also include dredging interventions in the tributaries between Szap and Gönyű. The dredging works on the mostly silted up, drying up surfaces of the tributaries during the low water period will significantly reduce the proportion of habitats of the oligo-mesotrophic stagnant water bodies with Littorelletea uniflorae and/or Isoeto-Nanojuncetea vegetation (3130) of Community importance and of the muddy rivers with Chenopodion rubri and Bidention vegetation (3270) of Community importance. In addition to the above, adverse effects on candidate habitat types of Community importance are mainly associated with transport, hauling, dumping and working on the floodplain bordering the mid-water bed. Direct impacts are likely to occur in the coastal zone of the floodplain, mainly in the near-shore section of conventional diversion works and in connection with the installation of guide works. In the absence of an organisational plan, at the current planning stage, the impact has been estimated by experts on the basis of the quantities of works to be constructed and the proportion of different types of works to be installed for each variant. Alternative I, which uses traditional diversion structures to connect to the mid-water embankment, and Alternative II, which uses the highest volume of hydraulic engineering stone, received the worst score (-5).
		-10 0	c5/3 Number of other rare character species, number of species of special conservation concern and species of Community importance and the nature and extent of the expected impact on their populations	**0**	**-10**	**-10**	**-8**	**-8**	There is also a significant difference between the variants in terms of the impact on other rare character species, protected species and specially protected species. The assessment typically takes into account the negative impacts associated with the construction, or the impacts on hydromorphological conditions and hence on biota relevant to the operational phase of the construction, and does not weigh the impacts of increased vessel traffic. The increase in traffic may occur in the operational phase as an effect independent of the variation (e.g. determined by economic factors) and, if a significant increase in traffic were assumed, the differences between the variations, independent of traffic but otherwise real, would be completely masked. In terms of this sub-criterion, options I and II scored the worst (-10 points), providing the required width for the whole length of the fairway. In contrast, the least favourable scores were given to variants III and III/a, which include fairway narrowings to minimise dredging interventions and use chevron dikes instead of conventional diversion structures, which are expected to have a more favourable impact on wildlife conservation after construction.
		-10 0	c5/4) Extent of habitat loss in the Danube river basin as aquatic habitat (expected extent of loss)	**0**	**-8**	**-2**	**-2**	**-2**	Many of the conventional diversion works, which reach all the way out to the mid-water margins, cause the area between these parallel works to fill up in the longer term. This phenomenon can also be observed in many places along the Danube between parallel diversion works extending towards the middle of the river. As the successional processes progress, the recharging riverbeds become increasingly submerged and then reforested, gradually losing their habitat functions for the aquatic fauna of the Danube. By far the worst score (-8) for this criterion is given to Option I, which basically uses conventional diversion structures up to the edge of the mid-water bed, while the other options studied use chevron dams in many sections with navigational problems.
		-6 0	c5/5) Nature and extent of the impact on the habitat diversity of the Danube river basin	**0**	**-6**	**-3**	**-2**	**-1**	In general, habitats with higher diversity, greater small- and medium-scale heterogeneity and higher habitat-level diversity tend to provide suitable habitat for a more diverse, species-rich community. Experience has shown that dredging and the installation of parallel diversion structures extending towards the middle of the bed and connecting to the shoreline of the mid-water bed will result in a more homogeneous bed and a reduction in habitat heterogeneity. In this criterion, Option I is clearly the least favourable (-6), due to the significant area of the bank affected by dredging as a result of the full-width fairway and the high proportion of the bank affected by siltation after construction due to the use of conventional diversion structures. The least adverse effects are observed in Option III/a (-1), due to the lowest volume of dredged material and the use of chevron dikes.
		-9 0	c5/6) Nature and extent of the impact on the ratio of artificial to natural substrate	**0**	**-4**	**-6**	**-5**	**-5**	The assessment of each alternative is negatively affected by the increase in the amount of hydraulic engineering stone to be installed, while the negative effects are mitigated by the demolition of existing stone works. The scores are derived by summing the quantities of materials used for construction and demolition. Based on this criterion, Option I is the least negatively rated. Available experience and survey results suggest that the presence of invasive and alien species is facilitated by the presence of hydraulic engineering stone quarries, which are more likely to colonise than natural substrates in the affected reach.
		-10 0	c5/7) Nature and extent of the impact on the water balance of the Danube habitats (from tributaries to habitats further away from the Danube affected by the Danube water level)	**0**	**0**	**0**	**0**	**0**	As a result of shallowing, rivers are draining groundwater from surrounding areas at ever lower levels, resulting in a significant drop in groundwater levels in areas along their banks. Depending on the hydrological characteristics of the areas concerned, the magnitude of the long-range effects of groundwater level declines associated with low flow periods can be very significant. This is also the case along the domestic Danube section. Declining groundwater levels have a negative impact on the water balance of groundwater-dependent ecosystems in the affected areas, leading to water scarcity and consequent degradation of ecosystems. A key design consideration was to avoid this negative impact. According to the information available at the current planning stage, none of the alternatives will cause such adverse effects.
C6) Environmental impacts due to traffic changes	**-2+4**	***-7 0***	c6/1) Consequences of emissions (air pollutants, noise) due to increased shipping traffic	**0**	**-6**	**-6**	**-6**	**-7**	Each of the variants is capable of handling up to more than twice the current traffic, so there is no difference between the variants in this respect. The additional loads due to the limited width of the riverbed sections required for option III/A were taken into account and option III/A scored one point lower than the others, thus achieving the lowest score. No traffic

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									increase was assumed for variant 0.
		-3 0	c6/2) Changes in bank and shore erosion (increased traffic, decreased narrower fairway)	**0**	**-3**	**-3**	**-3**	**-2**	As all options aim to improve navigability, there is no significant difference in traffic growth, with only Option III/A having a more moderate impact than the others, as the significant narrowing of the fairway in this option will discourage some vessel traffic, but the impact of this option is not negligible, as traffic growth can be expected here as well.
		-5 0	c6/3) Landscape and land use changes	**0**	**-4**	**-3**	**-1**	**-1**	The known interventions will be in the estuary, so at this stage of the planning process, the expected transformation of the riparian areas, which is expected to be an indirect effect of improving navigability conditions, is difficult to assess and is not directly due to the interventions planned in this project. The entire Danube river basin is part of the national landscape protection area, so that it is not possible to differentiate between the variations on this basis. The differences between the variants in the current planning phase can be based on the scale of the interventions, their location (in particular: impact on protected natural areas) and the expected vegetation destruction. The scale of vegetation destruction is similar in variants I and II, but in variant II chevron dams are planned near the Danube-Ipoly NP and Pannonhalmi TK, which represent a change from a landscape conservation point of view. However, the scale of vegetation destruction increases in variants III and III/A compared to variants I and II, and there is an intervention in the vicinity of Helemba Island, part of the Danube-Ipoly NP. From a landscape and landscape use point of view, the construction of stone works was the decisive factor in the assessment: however, there is significantly more spur construction in Variant I than in the other variants and more stone works are built in Variant II than in Variants III and III/A, so the latter are considered the most favourable. From a landscape and land use point of view, there is no difference between variants III and III/A.
		-5 +5	c6/4) Ecological impacts of vessel traffic (increased traffic increased, narrower waterway decreased)	**0**	**-3**	**-3**	**-3**	**-2**	Based on traffic data from the General Planner, freight traffic could reach +38% growth by 2050 and passenger traffic +75% (but not due to development). This is certainly an increase that could have a serious negative impact on the Danube's biota. As all options aim to improve navigability, there is no significant difference in traffic growth, with only Option III/A having a more moderate impact than the others, as the significant narrowing of the fairway in this option will somewhat discourage and slow down boat traffic, but the impact of this option is not negligible, as traffic growth can be expected here as well.
		0 +15	c6/5) Total emissions reduction due to offsetting	**0**	**8**	**8**	**8**	**8**	Each of the variants is capable of handling up to more than twice the current traffic, so there is no difference between the variants in this respect. For option III/A, the impact of the diversions required due to the limited width of the riverbed sections is negligible compared to the impact of the road traffic generated, and therefore all options score the same. Based on the traffic forecast obtained from the General Designer, on average half of the increase in vessel traffic is due to modal shift vehicle traffic. The modal shift is entirely shifted from road traffic. The increase in forecast growth from modal shift traffic alone (100%) would represent 15 points in the system. Correspondingly, a 50% modal shift traffic shift represents 7.5 points. In variant 0, no congestion was expected, 0 points were scored.
		0 +10	c6/6) Change in total transport energy demand	**0**	**5**	**5**	**5**	**4**	Because of the lower energy requirements of water transport compared to road transport, all but the zero variant have positive values. This is also because, even if we do not expect any congestion, i.e. no more goods arriving by water than before, they can be carried by larger vessels. More draught means more energy consumption for each vessel, but as fewer vessels will be needed, the overall fuel consumption for transporting goods by ship will be reduced. In the case of transhipment, the effect is even more positive, the more goods are transported by water, the lower the overall energy demand for transport, hence whichever option helps to transport more goods is more favourable in this respect. On the basis of the information available, options I, II and III can also provide the necessary increased volume of goods transported, so no distinction is made between these options in terms of energy consumption on the basis of the information available. Variant III/A may be less favourable in that additional energy consumption may be expected due to congestion and shutdowns. It should be added, however, that this criterion depends to a large extent on the modernity and energy consumption of the fleet, which does not depend on the variant with the intervention. In addition, the way in which goods are transported may be influenced by external factors which cannot be predicted at present, and no overall maximum score is given depending on these factors.
		0 +10	c6/7) Changes in land take resulting from congestion	**0**	**5**	**5**	**5**	**4**	There is not enough information available at this stage to investigate this in detail, but for the time being we can compare the different variants in terms of transport time, navigation aspects and fairway width, i.e. mainly throughput. As things stand at the moment, this is the same for variants I-II-III, so no distinction is made between them. For variant III/a, the potentially longer running time may cause some differences. In principle, however, we do not assume that land take resulting from road construction is solely for reasons that can be diverted to waterways (not all routes may be so flexible), so we do not give a maximum score to any variant.
C7) Environmental impacts on the operation of the waterway, maintenance of the new status, impacts of the existence of the new system.	**-2 +3**	***-15 0***	c7/1) Effects of carrying out maintenance dredging	**0**	**-15**	**-13**	**-13**	**-11**	The dredging volumes required to provide the depth of the fairway cannot be accurately predicted at this stage of the design because the extent of the dredging is a function of a number of future shaping effects, which can be inaccurately predicted. Nevertheless, based on the design experience of the fairway, these works can be estimated approximately, and an annual maintenance dredging of 20% of the total design value has been calculated. Accordingly, the least favourable option is Option I, as almost twice as much dredging is foreseen as in the most favourable Option III/A. There is no difference between variants II and III.
		0 +10	c7/2) Opportunities for improved water supply to tributaries	**0**	**10**	**10**	**10**	**10**	No distinction can be made between the variants, because all variants include the same tributary intervention and the same recharge can be ensured in all variants.
		0 +10	c7/3) Preserving the function of the aquatic habitat for small and medium-sized water bodies	**0**	**0**	**7**	**5**	**5**	No chevron dams are planned for Option I, but they are planned for the other options (II, III, III/A), and Option II has the highest number of chevron dams (23), thus creating a number of areas with potential habitat functions. It is important to note that Variant 0 scores 0 because the score is influenced by the number of chevron dams, and there are no chevron dams in this variant on the section. However, this does not mean that in terms of habitat number, variant 0 is the same as predicted for variant I, even though both variants score 0. This ratio refers only to the number of chevron dams.
		-5 +10	c7/4) Changes in the evolution of ecosystem services in the new state after the intervention	**0**	**-3**	**-3**	**-2**	**-1**	The scores are calculated on the basis of a scoring system taking into account 19 ecosystem services related to the Danube. The option with the least impact on ecosystem services and the closest approximation to natural river bed and hydromorphological conditions (III/A) is considered the most favourable. However, the changes to the bed, associated water and habitat degradation found in this variant also have an overall negative impact on most ecosystem services (provisioning, regulating, cultural) in the short and long term, despite the positive effects of certain measures (e.g. eradication of invasive species (scrub clearance), improvement of water supply to tributaries). Some ecosystem services (e.g. tourism or flood protection at certain points) are expected to increase in quantity or quality. Further study is recommended to assess the exact impacts and the interactions between changes in services.
C8) Assessment under	**-1+2**	***-5 +10***	c8/1) The status of the affected water	**5**	**1**	**0**	**2**	**3**	The biological and morphological characteristics of water bodies in the Danube at Szigetköz and the Danube between Gönyű

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III/A. var.	Evaluation
CCI 4.7			bodies is expected to be downgraded in the course of the WFD 4.7 analysis						and Sób negatively affected by the intervention in all variants. The changes in both parameter groups are mainly determined by dredging activities, the extent of bed deepening and the construction of hydraulic structures. Among the biological communities, algae are generally the most dependent on water chemistry, as the water chemistry is not significantly altered during construction or operation, and therefore no significant changes are expected. Macroinvertebrates are not affected as no changes in the riparian vegetation are expected. Fish and aquatic invertebrates will be locally affected. It is likely that these negative effects will be negligible for the whole water bodies. Negative changes are expected in some morphological characteristics, regularity, bed material, but no significant changes are expected. It is unlikely that the magnitude of change will reach the category of deterioration for any of the quality parameters. Neither for biological characteristics nor for morphological characteristics. The EIA will be the basis for a final decision on whether a detailed 4.7 assessment is required.
		0 +5	c8/2) Whether appropriate mitigation measures have been applied	**x**	**0**	**2**	**3**	**4**	For version 0, mitigation is not meaningful. There are no mitigation measures for CCI in Version I. In Variants II, III and III/A, the cutting of the spur lines and the creation of a secondary bank by dredging in the spur fields between each cut will improve the ecological effects of the structures. Mitigation measures to reduce environmental and water protection impacts are already included in versions III and III/A. In this respect, Option III/A is the best option.
		-5 +5	c8/3) Threatening or supporting the achievement of the objectives set for the water bodies concerned	**x**	**-3**	**-4**	**-2**	**0**	For version 0 it is not meaningful. The two water bodies concerned are subject to different VGT2 measures. The VGT2 measures whose implementation is affected by the project interventions are described below (+ for positive, 0 for neutral or no effect). Danube between Gönyű and Szob: 6.2 Establishment of appropriate vegetation in the floodplain 06.3a One-off removal of silt and riparian vegetation accumulated in watercourses and standing waters 06.4 Rehabilitation of zonation in the riparian zone of watercourses and standing waters depending on the water type 0 6.5 Gradual achievement and maintenance of good ecological status and potential of watercourses and standing waters through maintenance works 06.6 Demolition of in-stream facilities that have lost their function, gradual achievement of good ecological status and potential of the environment + 6.8 Improving the water supply to the floodplain and floodway 0 6.9. Reducing the impact of deeper than natural river beds and the resulting low and medium water level subsidence + 6.12.2 Compensatory floodplain afforestation in flow hollow areas 06.12.3 Reconstruction and maintenance of in-stream facilities, including the use of near-natural solutions and materials +6 .13. Adaptation of navigation to river or still water conditions+-Danube Island 6 .2 Establishment of appropriate vegetation in the floodplain 06.3a One-off removal of silt and riparian vegetation accumulated in watercourses and still waters 0 6.3b Adaptation of the shape and alignment of the riverbed to approximate the natural state, while meeting recognised human needs + 6.5 Gradual achievement and maintenance of the good ecological status and potential of watercourses and standing waters through maintenance works 06.7 Limitation of dredging and placement of dredged material that increases the size of the riverbed, with special attention to ecological and water protection aspects + 6.8 Improving the water supply to the floodplain and floodway 0 6.8a Restoring the connection of cut-off bends, silted-up dead branches and tributaries to the main branch, ensuring regular flooding of the floodplain or open floodplain +6 .9 Reducing the impact of deeper than natural river beds and the resulting low and medium water level + 6.12.2 Compensatory floodplain afforestation in flow hollow areas 0 6.12.3 Reconstruction and maintenance of in-stream facilities, including the use of near-natural solutions and materials + 7a.1 Recording, review, modification and authorisation of surface water abstractions and diversions 0 7.3.4 Modify water allocation to provide ecological low flows +33 .2 Special hydromorphological measures to improve the condition of protected natural areas, including special regulation of water abstractions, water management and water recharge to meet conservation needs +With no CCI objectives whose achievement is threatened by the project, a detailed 4.7 assessment is not expected to be required due to the impediments to implementation of the measures. Overall, the difference between the variants is determined by the amount of dredging activity and technical interventions.
C9) Environmental risks during the operation of the established fairway	**-2 0**	***-5 0***	c9/1) Changes in the risk of shipping accidents due to traffic growth and the new fairway	**0**	**-1**	**-1**	**-2**	**-2**	For the assessment of this criterion, the starting point was variant 0, where the number of days per year of navigation was not taken into account. The other 4 variants considered all have the same increase in traffic (since only the theoretical maximum traffic capacity differs between the variants, the realistic traffic volume expected to be able to pass unhindered is expected to be the same for all four variants), but for variants III and III/a, the fairways are also narrowed, relocated or unidirectional (which is the result of an even further narrowing). Hence, it can be said that the traffic increases do not affect the differences between the variants, and the traffic increase itself is not so large as to multiply the probability of accident risks, so the value given is itself close to 0. The difference between the variants is affected by the waterway narrowing, so that a lower score is given to variants III and III/a.
		-5 0	c9/2) Dredging risks	**0**	**-5**	**-3**	**-3**	**-2**	The dredging volumes required to provide the depth of the fairway cannot be accurately predicted at this stage of the design because the extent of the dredging is a function of a number of future shaping effects, which can be inaccurately predicted. Nevertheless, based on the design experience of the fairway, these works can be estimated approximately, and an annual maintenance dredging of 20% of the total design value has been calculated. Accordingly, the least favourable option is Option

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III/A. var.	Evaluation
									I, as almost twice as much dredging is foreseen as in the most favourable Option III/A. There is no difference between variants II and III.
		-5 0	c9/3) Increased likelihood of water quality incidents (e.g. ship discharges)	**0**	**-2**	**-2**	**-3**	**-3**	For the evaluation of this criterion, the values and methodology of criterion C9/1) have been adopted, with the difference that each variant scored one value lower. This can be explained by the fact that water pollution is not only caused by accidental events, but also by other types of pollution.
		-5 0	c9/4) Development of critical local air quality situations	**-2**	**-3**	**-3**	**-3**	**-3**	The increase in shipping traffic will inevitably affect air quality because of the increase in emissions. In locations that are inherently less favourable for geographical or anthropogenic reasons, this may contribute to critical situations (i.e. worsen an already unfavourable situation). There is no difference between the options in this respect, as each of them is capable of handling up to twice the current traffic volume. However, according to the traffic forecast provided by the General Project Manager, the increase in traffic is expected to be significantly lower and, in addition, can be spread over time as the number of sailing days increases. Furthermore, by allowing greater utilisation of the storage space, the volume of goods transported can be increased without increasing the number of vessels. To reflect the fact that there are already locations where air quality may occasionally be a concern due to existing vessel traffic, among other reasons, in this case option 0 is scored -2 rather than 0.
C10) Climate risk	**-2+3**	*-4 +5*	c10/1) Impact of changes in shipping traffic on GHG emissions from waterborne transport	**0**	**-1**	**-1**	**-1**	**-2**	The increase in traffic will increase the total fuel consumption of waterborne transport, thus increasing the total greenhouse gas emissions of waterborne transport. Each of the variants is capable of handling up to more than twice the current traffic, but the traffic forecast from the General Designer for the dry dock is much lower. There is no difference between the variants in this respect. The improvements will, however, allow for a much higher utilisation of the vessels' cargo space than is currently the case, thus allowing for a higher volume of goods to be transported without a significant increase in fuel consumption, which will also result in a reduction of GHG emissions, a positive effect that has been taken into account in the scoring. For Option III/A, the increase in the number of diversions required due to the limited width of the basin sections may lead to a small increase in fuel consumption, and therefore Option III/A scored one lower than the others. (Note that the increase in emissions due to increased traffic will be partly compensated by the proliferation of more modern, energy-efficient vessels (forced by stricter environmental requirements).)
		0 +20	c10/2) Impact of shifting road transport services to shipping on total GHG emissions from transport	**0**	**10**	**10**	**10**	**10**	Each of the variants is capable of handling up to more than twice the current traffic, but there is no difference in traffic volumes between the variants. Based on the traffic forecast provided by the General Designer, on average half of the increase in vessel traffic would come from modal shift vehicle traffic. The modal shift is entirely shifted from road traffic. The increase in forecast growth from modal shift traffic alone (100%) would represent 20 points in the system. Correspondingly, a 50% modal shift traffic shift represents 10 points. However, it is proposed to further investigate the expected impacts and necessary measures in the future.
		-4 0	c10/3) To what extent can the navigation conditions be ensured for a 1 -7% reduction in water yield according to the model simulation results?	**-4**	**0**	**0**	**0**	**0**	Based on the results of the model simulation of the expected long-term change in water flow, a 1-6% drop in water flow is expected on this section of the Danube by 2050, which, in the opinion of the responsible technical designers, can be compensated by the safety margin applied in the design and the water level drop can be managed during operation. For this reason, no specific climate change measures are envisaged at the current design stage. Given that all intervention options have been designed using the MVSZ 2018 working level, no differences can be made between the options and therefore all options have been assigned 0 points and option 0 has been assigned -4 points. However, it is recommended to further investigate the expected impacts and necessary actions in the future.
		-4 0	c10/4) To what extent can navigation conditions be ensured in the event of volatile weather expected as a result of climate change?	**-4**	**-2**	**-2**	**-1**	**-1**	The current situation is the most vulnerable to the effects of climate change, as 2018 has shown. It is difficult to distinguish between intervention options in this respect, as all of them aim to achieve a relatively lasting impact. In this respect, variants III and III/A have more shipping restrictions, but also less exposure to impacts.
		-3 +2	c10/5) Consideration of adaptation measures to climate change	**-3**	**-2**	**-2**	**-2**	**-2**	The implementation of the Programme will help shipping to adapt to changing climatic and weather conditions under current water flows, but we are not aware of any specific adaptation measure to climate change. Scoring: -2 - *low level of* consideration. Option 0 is scored the lowest, as no adaptation measure is considered.
		-2 0	c10/6) Degree of vulnerability of technical solutions to climate change	**-2**	**-2**	**-1**	**-1**	**-1**	The increase in the frequency of low flows has been taken into account in the determination of the working water level, but all variations of the fairway are considered equally vulnerable to further increases in low flow periods. Stone works are not considered vulnerable to further projected impacts of climate change on the area. Of the planned technical interventions, it is mainly the works involving the relocation of sediment, and in particular dredging, that are considered vulnerable to climate change, in the sense that they will be needed more frequently due to the significant channel-forming effect of floods. The frequency of extreme water levels on the Danube is expected to increase in the future, including the frequency of floods, and the variant with the highest number of planned and therefore maintenance dredging operations is therefore the one with the lowest score.
		-3 + 3	c10/7) Change in the extent of CO_2 sequestering, bioactive surfaces	**0**	**-1**	**-1**	**-2**	**-2**	Variants I and II involve much less vegetation destruction than Variants III and III/A, but there is no difference in the extent of vegetation destruction between Variants I/II and III/III/A... According to the studies carried out so far, a reduction in the amount of algal biomass is also expected in terms of CO_2 sequestration, as a consequence of human interventions, in addition to the effects of climate change. However, it is doubtful that a difference can be made between the variations based on current knowledge and information. A monitoring plan is proposed to address this uncertainty and problem.
D) Social and acceptability issues	**-5+5**			**-1,4**	**-0,4**	**0,9**	**1,8**	**1,6**	
D1) Acceptability to data subjects	**-2+1**	*-10 +5*	d1/1) Acceptability for angling	**-5**	**-7**	**-5**	**-4**	**-3**	Consultation with fish farmers has started. Dredging to improve navigability, the placement of dredged material and the construction and modification of water management facilities are disturbing fish stocks and fishing. The expected increase in boat traffic will seriously damage fish stocks and negatively affect the attractiveness of fishing tourism in fisheries management waters. Technical interventions to improve navigability will modify aquatic habitats of importance for fisheries management and have long-term effects on the hydromorphological processes that shape and maintain these habitats. Some water management facilities may limit fishing opportunities (e.g. chevron dam as a fishing access point). Interventions to compensate for adverse changes may improve the condition of habitats of critical importance for the survival of fish stocks.
		-10 +5	d1/2) Acceptability for water sports	**-1**	**-7**	**-6**	**-2**	**-1**	The gradual increase in waterway regulations and traffic will make it more difficult to use hand-powered watercraft and may increase the chances of accidents. The assessment is based on the volume and extent of near-shore works (spur, guideway, chevron dam construction, etc.). On the other hand, the increase in traffic compared to the current situation and the change in fairway width.

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III/A. var.	Evaluation
D2) Compliance with the preferences of the relevant water management organisations, the National Park and the relevant Authorities	-3+3	***-10 +10***	d2/1) Expected national park reception	**x**	**0**	**0**	**0**	**0**	Not yet known.
		-10 +10	d2/2) Acceptability for operators	**-5**	**-2**	**5**	**10**	**8**	Based on the discussions so far. Basically, it's the gradual increase in basin regulations and traffic that works best in this case. The maintenance of the waterway is influenced by three factors: the volume and extent of the maintenance work to be carried out each year; and the traffic generated, which will affect the maintenance of the markers. In turn, the effects of the intervention works on the morphology of the riverbed will have an impact on both maintenance and markings.
		-5 +5	d2/3) Expected reception by water protection and environmental authorities	**x**	**x**	**x**	**x**	**x**	It is not yet known, of course.
		-5 +5	d2/4) Professional judgement in shipping, transport	**-3**	**2**	**4**	**5**	**4**	Based on the discussions so far.
D3) Employment effects	**0+1**	***0 +10***	D3) Employment effects	**0**	**9**	**10**	**7**	**6**	The employment impact is influenced by four factors: the intervention works to be carried out, the annual maintenance works, the growth of the domestic fleet and its traffic, and the related increase in the labour demand of ports. The latter two are difficult to estimate at present, but the development options will differ little in this respect. It seems clear that Option II is the best option in this respect.
Total	**-40+60**			**7,2**	**11,5**	**17,5**	**24,3**	**26,6**	
				Excluded					

B) Section II: Danube between Szob - Dunaföldvár (1708,0-1561,0 fkm)

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III /A version.	Evaluation
A) Technical, navigational aspects, manageability of extreme water management situations	-5+30			8	18	20,1	24,1	25,4	
A1) Ensuring compliance with the parameters and conditions set in the target	-2+10	*0+20*	A1/1) Fairway Width	10	15	15	15	15	For all variants, the proposed widths were tested to the minimum allowable.
		0+10	A1/2) Sailing time on the section	0 multiplier	8	8	8	8	The navigation time on this stretch is roughly related to the width of the fairway.
		-5+20	A1/3) Hydraulic, flow conditions (flow directions, water speed)	5	12	13	15	15	Flow and velocity conditions were in line with the design concept. Versions I and II are independent of each oth Version III is a hybrid of the two.
		-5+10	A1/4) Increased safety of navigation (reduced risk of collisions, run aground)	5	6	7	8	8	Navigation safety increases in proportion to the improvement in flow and speed conditions.
		-10+40	A1/5) Rate of water level rise	0	20	20	20	20	No distinction is made in the rate of water level rise. Interventions compensate for water level reductions due to dredg
A2) Risks during implementation and operation	-1+5	*-5+20*	A2/1) Impact on aquifers, compliance with legal requirements	20	8	12	15	17	The extent to which aquifers are affected is determined by the location of the quarries used in the interventions and t of dredging. Throughout the variations, we have consistently sought to find the least intrusive intervention possible.
		0+10	A2/2) Complexity of implementation	0	8	3	7	9	The complexity of implementation increases with the scale of the planned interventions in the fairway and the a specialised stone works (chevron dams) used
		-3+20	A2/3) Flood safety	5	11	10	15	16	Flood safety decreases as the number of control works increases.
		-2+20	A2/4) Hydraulic conditions for ice discharge	5	10	13	15	17	Ice-discharge conditions are generally improved by the development of a uniform bed, but are also to some extent rela parameters of the bed width, sinuosity
A3) Sustainability of the overall system	-1+5	*0+10*	A3/1) Annual amount of maintenance dredging	0	3	7	10	10	The most favourable option is the one with the least dredging.
		-5+20	A3/2) Navigation, navigation aspects	5	12	13	15	14	Navigation and navigation aspects are improved as flow and speed conditions improve
		-5+20	A3/3) Safety aspects	5	10	12	15	16	Operational safety is related to the flow and speed conditions, fairway width and cornering parameters
A4) Smooth operation of the planned traffic growth	0+2	*0 +20*	A/4) Possibility to improve and further develop the system in place	0	10	14	15	17	The system can only be improved if the implemented version achieves its goal with as little intervention as possible
A5) Compatibility	-1+5	*-5+10*	A5/1) With related development plans (port development, ship park, etc.)	0	5	7	9	9	Options III and III/A are the most consistent with the associated development plans
		0+20	A5/2) Compliance for river management	5	10	12	16	17	River management is more favourable when water levels and flow conditions are favourable, when the riverbed is as u possible.
		-5+15	A5/3) Adaptability of the variant, adaptability to local conditions, flexibility	15	10	12	13	15	Adaptation to local conditions has included adapting to the needs of angling and sporting clubs in terms of water intal inlets, ferry crossings
		0+5	A5/4) Flexibility to choose the date of implementation	0	2	1	4	4	The flexibility in the timing of implementation increases in proportion to the reduction in the volume of interventions minimising interventions in the fairway.
A6) Level of adaptation to expected climate change	-1+3	*-10+30*	A/6) According to the degree of water level rise.	0	20	22	26	27	The level of resilience to expected climate change is proportional to the levelling capacity of the variant.
B) Economic, efficiency and land management issues	-5+10			0,8	0	0,5	2,2	3,1	
B1) Need for investment, one-off expenditure	0 +2	*0 +15*	B1/1) Investment, initial expenditure Ft, the higher the amount, the lower the score	x	5	5	7	8	Option 0 has no investment cost. Option I has the highest investment cost (HUF 10.3 billion), while Option II is cheaper (HUF 10.2 billion). The cheapest option is III/A (HUF 7.9 billion), 23% cheaper than Option I. Variant III is more expensive (HUF 8,4 billion), about 19% cheaper than Variant I.
		0 +5	B1/2) Eligibility for funding	x	2	2	3	4	The lower the costs, the more realistic the affordability
B2) Operating conditions	0 +2	*0 +8*	B2/1) Annual evolution of operating (running and maintenance) costs Estimate in Ft, taking into account maintenance cycle times	8	3	3	5	5	Version 0 includes not only the actual current costs, but also the minimum IT, setting and annual dredging costs ne ensure the expected operational standard, estimated at 460 M€/year. Options I and II are also the most expensive in maintenance (total operating cost of Option I is 621 M€, Option II is only 1% less, 616 M€), while Options III and about 15% cheaper (530 M€).
		0 +8	B2/2) Financial viability and sustainability of operation	6	3	3	5	5	The lower the costs, the more realistic the affordability. If we look at it proportionally, option 0 would score 8 points we have also taken into account that a good part of the necessary work is not being done at the moment, so som funding problem will arise.
		0 +4	B2/3) Institutional, organisational, professional and qualification background of operation	2	2	2	2	2	It's the same everywhere, because it takes several specialists to run each version.
B3) Total cost, cost-effectiveness	-1 +2	*-5 +10*	B3/1) Present value of the sum of investment, non-recurrent expenditure and operating costs over a 20-year period.	x	1	1	4	5	The score for variant 0 is not meaningful, because we calculate a development margin in the variant analysis. Opt Option II are almost equally expensive (11 bn HUF) and the cheapest, 28% lower than the former, is Option III/A (8.1 with Option III slightly higher (8.5 bn HUF, 24% lower than Option I).
		-5 +10	B3/2) Cost-effectiveness, present value of costs per unit of turnover	x	1	1	4	5	Efficiency indicator projection based on expected traffic. forecast traffic growth can be met by all variants. Therefore of efficiency is the same as the order of the present value of costs.
B4) Direct economic benefits (shipping, transport, GDP, etc.)	0 +2		B4) Direct economic benefits	x	2	2	2	2	The direct economic benefit is proportional to the increase in turnover, which is assumed to be the same for all variant
B5) Indirect economic and social benefits	0 +2	*0 +4*	B5/1) Impact on water sports, fishing	0	0	0	0	0	No positive impact can be expected on water sports and fishing. The users of fisheries water areas cannot expect to be improved navigability and increased boat traffic (with appropriate compensatory measures, fishing tourism attraction sales of area fishing tickets and ancillary services can be increased)

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III /A version.	Evaluation
		0 +4	B5/2) Impact on tourism	2	1	1	2	2	There are both negative and positive effects. Positive for tourist navigation, negative for possible landscape degradatio
		0 +4	B5/3) Environmental benefits	0	2	3	3	4	Transfers from road transport and other environmental benefits. If traffic growth is the same, then these benefits are t Each intervention includes measures to improve the environment, but these vary from alternative to alternative.
		0 +4	B5/4) Employment benefits, contribution to the area's ability to support itself	0	4	4	2	2	Construction employment effects are temporary, permanent employment effects are the additional number operating, the higher the costs, the higher the employment benefits
		0 +4	B5/5) Economic development benefits, possibility of creating new related development programmes	0	2	2	2	3	Construction for realization the more expensive the investment, the higher the growth in construction demand. If tra same across the variants, then the scale of port construction, the combined transport development demand is t Variants III, IIIA have the most need for ports, so some additional port development is needed here.
B6) Indirect economic social damage	-2 0	*-10 0*	B6/1) Additional charges on the part of the persons concerned	-10	-3	-4	-6	-7	Impact on shipping businesses Inversely proportional to water depth, passage time), so the environmentally worst i economically
		-10 0	B6/2Environmental damage	x	-10	-7	-4	-2	in proportion to the potential degradation of ecosystem services.
B7) Economic risks	-2 0	*-10 0*	B7/1) Changes in shipping demand/traffic (domestic, international) do not require intervention	0	-10	-10	-7	-5	The higher the costs, the higher the economic risk
		-10 0	B7/2 Impact on certain economic activities	0	-5	-3	-2	-2	As regards the development options, the impact on the operation of the Paks NPP is questionable. In addition, hov persistence of transport constraints poses some risk to development options.
C) Protection of the environment, nature and landscape	-25+15			-1,1	-11	-9,6	-7	-5,5	
C1) Size of the area affected by the intervention	-2 0	*-10 0*	C1/1) Total area used for works (direct and indirect)	0	-9	-10	-8	-7	Although there are differences in terms of land occupation between the different options, given that no significant ma work (neither dredging nor construction or demolition of masonry) is currently carried out on the section under stu from a few isolated sites, all intervention concepts could result in significant differences compared to the zero optio context of the project, the waterway was designed with the greatest amount of narrowing in Option III/A in order to r amount of work to be carried out in the riverbed, and therefore Option III/A is the preferred option based on our Option I contains slightly more interventions than Option A, while Option II contains significantly more interventio therefore the least favourable from the point of view of land use.
		-10 0	Dredging area (and area for disposal of dredged material)	0	-9	-10	-8	-7	Dredging is included in the variation assessment in several aspects, because this type of intervention has the most s direct impact, in terms of habitat protection, aquifer protection, soil protection, hydromorphology and, indirectly, other environmental disciplines. In terms of its impact, it is the surface area of the work in the riverbed rather than i that matters. After the zero option, in which no dredging is considered, Option III/A, which envisages the most fairway, has the least surface area of dredging and is therefore the most favourable, while Option II requires significa dredging and is therefore the least favourable.
C2) Difference in fairway width compared to the current situation	0 +2	*0+20*	C2) Difference in fairway width compared to the current situation	0	1	1	2	2	Compared to the current fairway designation, all the intervention options foresee a narrower fairway on the stretch 1791-1708 fkm (150 m width instead of 180 m), which is beneficial from an environmental (noise, habitat, social, e services) point of view. The most favourable option is Option III/A with minimum width, followed by Options I and are considered to be of equal width.
C3) Impact on aquifers	-4 0	***0 or 0 multiplier***	c3/1 Dredging in the outer/inner protection zone of an operational aquifer	0	**0 multiplier**	**0 multiplier**	**0 multiplier**	0	According to Annex 5 of the Government Decree No. 123/1997 (VII. 18.) on the protection of aquifers, remote aqu water installations for drinking water supply, it must be taken into account in the planning that no excavation work affecting the cover or aquifer) may be permitted in the inner and outer protection areas of the coastal filtered **As dredging is planned for 27 276 m^2 in Option I and 23 337 m^2 in Options II and III in the outer protect of the Tótfalui waterworks, the above criterion is not met for these options, and therefore only Option feasible from the point of view of protection of the aquifer.**
		-10 0	c3/2 Dredging [m^2] in hydrogeological protection area A/B of operating aquifer	0	-2	-2	-2	-1	With the exception of Alternative 0, the same amount of bed excavation is foreseen in the hydrogeological A/B prote of the aquifer in Alternatives II and III, and slightly more in Alternative I. As the impact is between 2 and 2.5% for all all variants except 0 and III/A score -2, as they have the lowest amount of bed scour.
		-10 0	c3/3 Maintain dredging in the protection zone of (remote) aquifers	0	0	0	0	0	The dredging volumes required to provide the depth of the fairway cannot be accurately predicted at this stage of t because the extent of the dredging is a function of a number of future shaping effects, which can be inaccurately However, even if a 20% annual maintenance dredging rate, estimated on the basis of design experience with the f assumed, no difference can be made between the variants, as all variants have the same minimum dredging rate (less planned for the distant water protection area.
		-10 0	c3/4 Sedimentation in the protection zone of an operating aquifer	0	0	0	0	0	Based on the model calculations carried out, no sedimentation of sediment exceeding the specified criterion is expec outer or inner protection zone of the receiving water body.
		-10 0	c3/5 Sinkhole in the protection zone of an operating aquifer	0	0	0	0	0	Based on the model calculations carried out, no sedimentation exceeding the specified criterion is expected in the inner protection zone of the receiving water body.
C4) Adverse environmental impacts of the deployment of the system	-3 +1	*-5 0*	c4/1) Impact of deposition on air quality and noise and vibration emissions	0	-5	-4	-3	-2	The interventions planned in each version, involving the operation of machinery and transport needs, were taken into In addition to the total volume of each work, we have also tried to take into account the differences in the planned loc a starting point, the possible impact on residential areas within a radius of 500 m was examined. Variations involving volume of work or interventions involving work in the vicinity of more populated areas were given lower scores. option in this respect (Option I) received the lowest score (-5), against which the other options were compared. Varian 0 points.
		-3 0	c4/2) Causation, avoidability of water quality problems	0	-3	-3	-1	-1	Any construction work in a riverbed during construction has the potential to cause water quality problems, so the exte is determined by the extent of the area of construction activity in the riverbed. As a result of the analysis, it was foun most favourable options are III and III/A, while the least favourable options are I and II.
		-5 +10	c4/3) Impacts on the hydromorphological conditions of the riverbed (e.g. risk of deepening of the riverbed, risk of water level reduction)	0	-2	-1	-1	-1	From a hydromorphological point of view, the expected changes during construction can be considered in the cont way the artificial stone works are constructed and the disturbance of the natural bed by the intervention in the be temporary or long-term effects. In summary, any intervention that impairs or compromises the diversity of th conditions of the riverbed will have a negative impact on the hydromorphology of the Danube. The design of works th maintain diversity and ensure the navigational purpose with the least possible interference and use of artificial works

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III /A version.	Evaluation
									adverse effect, and some measures, such as spur cuts, can have a positive effect on existing artificially regulated stret options of equal rank are III, III/A and II, which are equivalent, with Option II being the least favourable. In terms of the effects on bed deepening and water level changes and the actual effects on the bed morphology, no cle and scoring can be given on the basis of the current studies, however, as the degree of regulation increases and positive effects are expected, artificial works are introduced into the bed, so the effects are assumed to be rather negati
		-3 0	c4/4) Impact of the dredging activity on the geological medium	**0**	**-2**	**-3**	**-1**	**-1**	The most favourable variants are III and III/A, followed by I and finally II.
		-2 0	c4/5) Problems and management of waste from construction works	**0**	**-2**	**-2**	**-1**	**-1**	Existing data do not include information on the amount of waste generated during construction works. The on distinguish between the different options is to assume that the option that involves more material handling, con reconstruction or demolition of more river control features generates more waste. The excavated sediment is not c waste because it is deposited in its original environment, the river. Furthermore, the aim is that the material left over dismantled hydraulic structures will be used in the construction process. The largest amount of material handled in Variant I is 625 thousand m^3, in Variant II 593 thousand m^3 , in Varian thousand m^3 and in Variant III/A 472 thousand m^3.
		-3 0	c4/6) Disturbance of direct water uses	**0**	**-3**	**-2**	**-1**	**-1**	The disruptive impact of construction activity is related to both the land use, duration and nature of the works. Works the shipping lane are more likely to disturb navigation itself, while construction and demolition works closer to the more likely to disturb those using the areas. The area affected is known. Time is another important factor. This may be related to the amount of work required for the variations, but also depends on, for example, how many sections ar on at the same time.
		-3 0	c4/7) Summary of the effects on the settlement environment	**0**	**-3**	**-2**	**-1**	**-1**	The negative impacts are primarily related to specific construction activities (thus affecting coastal settleme secondarily to the expected increase in vessel traffic. There are 15 settlements in the study area where interventions ar in the vicinity of the river (residential areas, recreational areas, enclosed areas): Dömös, Vác, Göd, Szigetmonostor, D Budapest, Százhalombatta, Ercsi, Kulcs, Dunaújváros, Baracs, Dunaföldvár, Baja, Báta, Mohács. In all var municipalities are directly affected by the negative environmental impacts of construction, but in the same locations larger interventions are planned in variant I. Furthermore, a distinction can also be made on the basis of the sc interventions (e.g. dredging, total amount of stone moved), on the basis of which overall, Option I is the least favo terms of dredging, there is not much difference between Option I and Option II, but the total amount of stone moved of magnitude higher in Option I. There is a slight difference between variants II and III, with fewer interventions p variant III and slightly fewer residential and recreational areas directly affected. There is no significant difference in n between variants III and III/A, but the least amount of intervention is planned in III/A, so that overall, varian considered the most favourable.
		-3 0	c4/8) Archaeological and cultural heritage impacts	**0**	**-2**	**-2**	**-2**	**-2**	There are high levels and proportions of known sites affected, and a high level of dredging (although Option III/A is favourable in this respect), but no dredging of critical sites. In terms of other cultural heritage protection, one monum affected in all variants, as the monument also affects the Danube riverbed (Budapest, Budapest quays - dredging is p the area of District III). In addition, there are about 14 other monuments located near the coast in the areas o Visegrád, Verőce, Tahitótfalu, Dunakeszi, Szigetmonostor, Budapest, Százhalombatta and Ercsi, some of which are cl planned bunds in variants II, III and III/A, but no monuments are directly affected in any of the variants. Among t Heritage sites, the "Danube Coast and Buda Castle District", the "Borders of the Roman Empire - The Hungarian sect Danube Limes" and the "Danube Bend Cultural Landscape" are affected. Two of the protected sites of local impor located close to the coast, but neither of them is likely to be affected by either of the options (Százhalombatta: Fis Tavern, Ercsi: Monument to the Boatmen and the Victims of the Danube).
		-3 0	c4/9) Transboundary impacts	**0**	**0**	**0**	**0**	**0**	Due to the geographical location of the section between Szob and Dunaföldvár, the implementation of the interventi expected to have cross-border effects, but the positive and negative effects of the expected increase in vessel traffic w to e.g. Slovakia, Austria, Germany, Benelux countries, and Serbia, Romania and Bulgaria to the south. The significa increase in vessel traffic and its magnitude cannot be assessed at this stage.
C5) Conservation impacts during construction and maintenance	**-7 0**	***-5 0***	c5/1) Affected protected natural area of national importance (extent of the direct and indirect impact of the variant on protected areas)	**0**	**-4**	**-4**	**-4**	**-4**	There is no significant difference between the variants studied in terms of the extent to which they affect a protect national importance, as all variants typically affect the same fords and reefs, but the type and scale of intervention d also considered as protected area affected those cases where the mid-water bed itself does not belong to a protecte area of national importance, but its shoreline is already directly affected by protected nature of national importance island in the bed or the riffle area accompanying the bed). In particular, the assessment of the construction impact ar for all variants, despite the small differences. The operational scope was scored -5 for all variants, as the increase in volume that can be expected during operation following development will affect the whole section and its wildlife. assessment was based on the average of the scores for the construction and operational phases, rounded upwards whole number can be given. This resulted in a score of -4.
		-5 0	c5/2/1) Natura 2000 site affected (extent of the direct and indirect effect of the variant on Natura 2000 sites)	**0**	**-4**	**-4**	**-4**	**-4**	There is no significant difference between the variants studied in terms of the extent to which they affect a protect national importance, as all variants typically affect the same fords and reefs, but the type and scale of intervention d also considered as protected area affected those cases where the mid-water bed itself does not belong to a protecte area of national importance, but its shoreline is already directly affected by protected nature of national importance island in the bed or the riffle area accompanying the bed). In particular, the assessment of the construction impact ar for all variants, despite the small differences. The operational scope was scored -5 for all variants, as the increase in volume that can be expected during operation following development will affect the whole section and its wildlife. assessment was based on the average of the scores for the construction and operational phases, rounded upwards whole number can be given. This resulted in a score of -4.
		-10 0	C5/2/2) Expected impact on candidate species of Community importance during construction and operation	**0**	**-10**	**-8**	**-6**	**-4**	In terms of Natura 2000 site impact, there is no significant difference between the variants studied, as all variants same river sections that hinder navigation in low water periods, but the type and volume of intervention differs. In p the assessment of the impact on the construction zone was -3 for all variants, despite the small differences. The op reach was scored -5 for all variants, as the increase in navigation volume assumed during operation following develop affect the entire stretch and its wildlife. The final assessment was based on the average of the scores for the constru operational phases. This resulted in a score of -4.
		-5 0	C5/2/3) Expected impact on candidate	**0**	**-2**	**-1**	**-1**	**-5**	There are significant differences between the variants in terms of the impact on the candidate animal and plant s

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III /A version.	Evaluation
			habitat types of Community importance during construction and operation						Community importance. The assessment typically takes into account the negative impacts associated with the constr the impacts on hydromorphological conditions and hence on organisms relevant to the operational phase associated construction, and does not weigh the impacts of increased vessel traffic. The increase in traffic may occur in the op phase as an effect independent of the variation (e.g. determined by economic factors) and, if a significant increase were assumed, the differences between the variations, independent of traffic but otherwise real, would be completely In terms of this sub-criterion, Option I clearly scores the lowest (-10 points), providing the required width for the ent of the fairway using conventional control works. In contrast, the least unfavourable rating was given to Option III includes fairway narrowings in most places and along the longest sections to minimise dredging interventions and use dikes and benthic bunds instead of conventional baffles, which are expected to have less adverse effects on conservation after construction, but which also makes the least use of conventional baffles.
		-10 0	c5/3 Number of other rare character species, number of species of special conservation concern and species of Community importance and the nature and extent of the expected impact on their populations	**0**	**-10**	**-9**	**-8**	**-1**	Adverse impacts on candidate habitat types of Community importance are mainly associated with transport, hauling, and working on the floodplain bordering the mid-water bed. Direct impacts are likely to occur mainly in the nearsho of the traditional diversion works and in the coastal zone of the floodplain associated with the installation of guide the absence of an organisational plan, at the current planning stage, the impact has been estimated by experts on th the quantities of works to be constructed and the proportion of different types of works to be installed for each varian I, which uses the highest proportion of traditional diversion works to the middle waterway and the largest amount of engineering stone, was given the worst score (-2).
		-10 0	c5/4) Extent of habitat loss in the Danube river basin as aquatic habitat (expected extent of loss)	**0**	**-4**	**-2**	**-1**	-7	There is also a significant difference between the variants in terms of the impact on other rare character species, species and specially protected species. The assessment typically takes into account the negative impacts associated construction, or the impacts on hydromorphological conditions and hence on biota relevant to the operational pha construction, and does not weigh the impacts of increased vessel traffic. The increase in traffic may occur in the op phase as an effect independent of the variation (e.g. determined by economic factors) and, if a significant increase were assumed, the differences between the variations, independent of traffic but otherwise real, would be completely In terms of this sub-criterion, Option I scores the lowest (-10 points), providing the required width for the entire len fairway. In contrast, the least favourable rating was given to Option III/a, which includes fairway narrowing in most p along the longest sections overall, and uses chevron dikes and benthic baffles instead of conventional baffles, v expected to have less adverse effects on wildlife conservation after construction, in order to minimise dredging interve
		-6 0	c5/5) Nature and extent of the impact on the habitat diversity of the Danube river basin (can we say now?)	**0**	**-6**	**-3**	**-2**	**-1**	Many of the conventional diversion works, which reach all the way out to the mid-water margins, cause the area betw parallel works to fill up in the longer term. This phenomenon can also be observed in many places along the Danube parallel diversion works extending towards the middle of the river. As the successional processes progress, the r riverbeds become increasingly submerged and then reforested, gradually losing their habitat functions for the aquati the Danube. In terms of this criterion, Option I clearly scores the lowest (-4), as it basically uses conventional structures up to the edge of the mid-water bed, while the other options studied use chevron dams or bottom fins sections with navigational problems.
		-9 0	c5/6) Nature and magnitude of the impact on the ratio of artificial to natural soils (can we tell now?)	**0**	**-4**	**-4**	**-4**	**-2**	In general, habitats with higher diversity, greater small- and medium-scale heterogeneity and higher habitat-level tend to provide suitable habitat for a more diverse, species-rich community. Experience has shown that dredging installation of parallel diversion structures extending towards the middle of the bed and connecting to the shoreline of water bed will result in a more homogeneous bed and a reduction in habitat heterogeneity. In this criterion, Option I the least favourable (-6), due to the significant area of the bank affected by dredging as a result of the full-width fairwa high proportion of the bank affected by siltation after construction due to the use of conventional diversion structures III and III/a have the least negative impacts (-2). Of the two options, Option III has a slightly higher dredged materi and uses chevron dikes and bottom fins, but at the lowest possible rate, while Option III/a has the lowest dredged volume and dredged area and also uses chevron dikes and bottom fins, but at a slightly higher rate than Option differences of opposite sign cancel each other out, which is why both variants received the same score.
		-10 0	c5/7) Nature and extent of the impact on the water balance of the Danube habitats (from tributaries to habitats further away from the Danube affected by the Danube water level)	**0**	**0**	**0**	**0**	**-4**	The assessment of each alternative is negatively affected by the increase in the amount of hydraulic engineering st installed, while the negative effects are mitigated by the demolition of existing stone works. The scores are derived by the quantities of materials used for construction and demolition. Based on this criterion, all three options have the sa (-4). Based on available experience and survey results, the invasion of alien and invasive species is facilitated by the pr hydraulic engineering stone quarries, which are able to colonise a higher proportion of the natural substrates in th section.
C6) Environmental impacts due to traffic changes	**-2+4**	*-7 0*	c6/1) Consequences of emissions (air pollutants, noise) due to increased shipping traffic	**0**	**-6**	-7	-7	-7	All the variants are suitable for the design traffic, so there is no difference between the variants in this respect. For va III and III/A, the additional loads caused by the necessary detours due to the limited width of the fairway have been t account and these three variants have therefore been given one point less than variant I. No traffic increase was ass variant 0.
		-3 0	c6/2) Changes in bank and shore erosion (increased traffic, decreased narrower fairway)	**0**	**-3**	**-3**	**-2**	**-2**	As all options aim to improve navigability, there is no significant difference in traffic growth, with Option III havin moderate impact than the others, as the significant narrowing of the fairway in these options will discourage som traffic, but the impact of this option is not negligible, as traffic growth can be expected here as well.
		-5 0	c6/3) Landscape and land use changes	**0**	**-5**	**-4**	**-3**	**-3**	The known interventions are in the riverbed, so at this planning stage it is difficult to assess the likely transformati riparian areas. The entire Danube riverbed is part of the national landscape protection area, so it is not possible to dif between the changes on this basis. The differences between the variants in the current planning phase are mainly bas scale and location of the interventions (in particular: impact on protected natural areas). The scale of interventions in is typically larger (dredging, total stone handling) than in the other variants, but the area occupied is minimally small ha) than in Variant II. In terms of scale of intervention, variants III and III/A are the most favourable (no differenc between them), which can be considered favourable from a landscape-landscape-use point of view. In terms of natural areas of national importance, the Duna-Ipoly National Park, the Háros-sziget Ártéri-erdő TT, the Rácalmási and the Duna-Dráva National Park are affected, but in terms of the scale of interventions, variants III and III/A are c most favourable. Overall, in terms of landscape protection, options III and III/A are the most favourable, with differences between options I and II being the dredging and the total amount of stones moved, which makes option favourable than option I.
		-5 +5	c6/4) Ecological impacts of vessel traffic	**0**	**-3**	**-3**	**-3**	**-2**	Based on traffic data from the General Planner, freight traffic could reach +38% growth by 2050 and passenger tra

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III /A version.	Evaluation
			(increased traffic increased, narrower waterway decreased)						(but not due to development). This is certainly an increase that could have a negative impact on the Danube's bio options aim to improve navigability, there is no significant difference in traffic growth, with only Option III/A havin moderate impact than the others, as the significant narrowing of the fairway in this option will discourage some vess but the impact of this option is not negligible, as traffic growth can be expected here as well.
		0 +15	c6/5) Total emissions reduction due to offsetting	**0**	**8**	**8**	**8**	**8**	All the variants are suitable for the design traffic, so there is no difference between the variants in this respect. For v and III, the impact of the diversions required due to the limited width of the fairway sections is negligible compar impact due to the road traffic generated, and therefore each variant scores the same. Based on the traffic forecast obta the General Designer, on average half of the increase in vessel traffic is due to modal shift vehicle traffic. The mod entirely shifted from road traffic. The increase in forecast growth from modal shift traffic alone (100%) would rep points in the system. Accordingly, a 50% modal shift of traffic would result in a 7.5 point shift, rounded up to 8 variant 0, no congestion was expected, 0 points were scored.
		0 +10	c6/6) Change in total transport energy demand	**0**	**10**	**10**	**9**	**9**	Because of the lower energy requirements of water transport compared to road transport, all but the zero variant hav values. This is due to the fact that, in addition to the shift from road, even if no shift is expected, i.e. no more goods water than before, they can be carried by vessels with a larger draught. More draught means more energy consumptio vessel, but because fewer of them will be needed, the overall fuel consumption for transporting goods by ship will be In the case of transhipment (which is currently assumed), the effect is even more positive, the more goods are trans water, the lower the overall energy demand for transport, hence whichever option helps to transport more goods favourable in this respect. On the basis of the information available, options I, II and III can also provide the increased volume of goods transported, but options III and III/A may be less favourable in that additional energy con can be expected due to congestion and stoppages. It should be added, however, that this criterion depends to a large the modernity and energy consumption of the fleet, which does not depend on the variant with the intervention. In the way in which goods are transported may be influenced by external factors which cannot be predicted at present.
		0 +10	c6/7) Changes in land take resulting from congestion	**0**	**5**	**5**	**4**	**4**	There is not enough information available at this stage to investigate this in detail, but for the time being we can con different variants in terms of transport time, navigation aspects and fairway width, i.e. mainly throughput. At this sta the same for variants I and II, so no distinction is made between them. In the case of variants III and III/A, the p longer running time may cause some differences. In principle, however, we do not assume that land take resulting f construction is solely for reasons that can be diverted to waterways (not all routes may be so flexible), so we do n maximum score to either variant.
C7) Environmental impacts on the operation of the waterway, maintenance of the new status, impacts of the existence of the new system.	**-2 +3**	***-15 0***	c7/1) Effects of carrying out maintenance dredging	**0**	**-15**	**-15**	**-13**	**-12**	The dredging volumes required to provide the depth of the fairway cannot be accurately predicted at this stage of t because the extent of the dredging is a function of a number of future shaping effects, which can be inaccurately Nevertheless, based on the design experience of the fairway, these works can be estimated approximately, and a maintenance dredging of 20% of the total design value has been calculated. Accordingly, the least favourable var variants I and II, with almost the same amount of dredging, and the most favourable variant III/A.
		0 +10	c7/2) Opportunities for improved water supply to tributaries	**0**	**4**	**4**	**4**	**4**	No distinction can be made between the alternatives, as none of the alternatives include specific tributary interventio section, while none of the alternatives worsen the recharge of the tributaries or provide for the possibility of further rehabilitation in a separate project. Minimal interventions in the tributaries are planned in the planning phase, a supply is likely to improve only minimally or stagnate.
		0 +10	c7/3) Preservation of the function of the aquatic habitat of small and medium-sized water bodies	**0**	**0**	**3**	**3**	**2**	No chevron dams are planned for Option I, but for the other options (II, III, III/A) they are. There is no major between the number of chevron dams planned for variants II, III and III/A, with one more chevron dam planned for (7). It is important to note that Option 0 scores 0 points because the score is influenced by the number of chevron dam this option there are no chevron dams on the section. However, this does not mean that in terms of the number of variant 0 is the same as predicted for variant I, even though both variants score 0. This ratio refers only to the n chevron dams.
		-5 +10	c7/4) Changes in the evolution of ecosystem services in the new state after the intervention	**0**	**-3**	**-2**	**-1**	**-1**	The magnitude of the impact is most influenced by the extent of interventions in the riverbed and habitats. Again, t with the least impact on ecosystem services (III/A) is considered the most favourable. Overall, ecosystem service negatively affected by the project, but some interventions (e.g. restoration of natural habitats, eradication of invasiv may have a positive impact on services. Among the cultural services, fishing, recreation and aesthetic ecosystem servic negatively affected by the Programme, while e.g. tourism will experience a qualitative increase.
C8) Assessment under CCI 4.7	**-1+2**	***-5 +10***	c8/1) The status of the affected water bodies is expected to be downgraded in the course of the WFD 4.7 analysis	**5**	**1**	**2**	**3**	**4**	The intervention will negatively affect the biological and morphological characteristics of the *Danube between Szob-* *Danube-Budapest* and *Danube Budapest-Dunaföldvár in* all variants. The changes in both parameter groups a determined by dredging activities, the extent of bank deepening and the construction of hydraulic structures. A biological communities, algae are generally the most dependent on water chemistry, as water chemistry does no significantly during construction or operation, and therefore no significant changes are expected. Macroinvertebrate affected as no changes in the riparian vegetation are expected. Fish and aquatic invertebrates will be locally affected. that these negative impacts will be negligible for the whole water bodies. Negative changes are expected in some morp characteristics, regularity, bed material, but no significant changes are expected. It is unlikely that the magnitude of ch reach the category of deterioration for any of the quality parameters. Neither for biological characteristics morphological characteristics. The EIA will be the basis for a final decision on the need for a detailed assessment of the
		0 +5	c8/2) Whether appropriate mitigation measures have been applied	**X**	**0**	**0**	**3**	**4**	No mitigation is interpreted for version 0. There are no mitigation measures for the CCI in Versions I and II. M measures for environmental, water protection impacts are already included in Variant III. In this respect, therefore, C A is the best option.
		-5 +5	c8/3) Threatening or supporting the achievement of the objectives set for the water bodies concerned	**x**	**-4**	**-2**	**-1**	**0**	Not interpretable for version 0. The two water bodies concerned have different measures foreseen in VGT2. Below we the VGT2 measures whose implementation is affected by the project interventions (+ for positive, 0 for neutral or no e (1) Danube between Szob-Budapest, (2) Danube-Budapest, (3) Danube between Budapest-Dunaföldvár: 6.2 Establishment of suitable vegetation in the floodplain 0 (1,2,3) 6.3a One-off removal of silt and riparian vegetation accumulated in watercourses and standing waters 0 (1,2) 6 .

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III /A version.	Evaluation
									5. Dismantling of in-stream facilities that have lost their function, progressively achieving good ecological status and pot the environment + (1,2,3) 6 . 8. Reduction of the impact of deeper than natural river beds and the resulting low and medium water level + (1,3) 6.12.3 Reconstruction and maintenance of in-stream facilities, including the use of near-natural solutions and materia (1,2,3) 6.13 Adaptation of navigation to river or still water conditions 0 (1,2,3) 7.1 Modification of the inland drainage system 0 33.2 Special hydromorphological measures to improve the status of protected natural areas, including special reg water abstraction, water management and water recharge to meet nature conservation needs 34.2.Ensuring water quality required for nature conservation, in addition to other water quality protection measu As there are no WFD objectives whose achievement would be compromised by the project, a detailed 4.7 assessm expected to be required due to the impediment to implementation of the measures. Overall, the difference between th is determined by the amount of dredging activity and technical interventions.
C9) Environmental risks during the operation of the established fairway	**-2 0**	***-5 0***	c9/1) Changes in the risk of shipping accidents due to traffic growth and the new fairway	**0**	**-1**	**-1**	**-2**	**-2**	For the assessment of this criterion, the starting point was variant 0, where the number of days per year of navigatio taken into account. The other 4 variants considered all have the same increase in traffic (as only the theoretical traffic capacity differs between the variants, the realistic traffic volume expected to be able to pass unhindered is expe the same for all four variants), but for variants III and III/a, the fairways are also narrowed, relocated or unidirection results in a further narrowing). Hence, the traffic increases do not affect the differences between the variants, increase itself is not so large as to multiply the probability of accident risks, so the score itself is close to 0. The between the variants is affected by the waterway narrowing, so that the variants III and III/a score worse.
		-5 0	c9/2) Dredging risks	**0**	**-5**	**-5**	**-4**	**-3**	The dredging volumes required to provide the depth of the fairway cannot be accurately predicted at this stage of because the extent of the dredging is a function of a number of future shaping effects, which can be inaccurately Nevertheless, based on the design experience of the fairway, these works can be estimated approximately, and maintenance dredging of 20% of the total design value has been calculated. Accordingly, the least favourable va variants I and II, with almost the same amount of dredging, and the most favourable variant III/A.
		-5 0	c9/3) Increased likelihood of water quality incidents (e.g. ship discharges)	**0**	**-2**	**-2**	**-3**	**-3**	For the evaluation of this criterion, the values and methodology of criterion C9/1) have been adopted, with the differ each variant scored one value lower. This can be explained by the fact that water pollution is not only caused by events, but also by other types of pollution.
		-5 0	c9/4) Development of critical local air quality situations	**-3**	**-4**	**-4**	**-4**	**-4**	The increase in shipping traffic will inevitably affect air quality because of the increase in emissions. In location inherently less favourable for geographical or anthropogenic reasons, this may contribute to critical situations (i.e. already unfavourable situation). In this respect, no distinction can be made between the variants, as all of them are su the planned traffic. To show that there are locations on the route (especially in Budapest) where air quality is son concern for reasons related to the vessels (e.g. forced use of generators, outdated engines), in this case, variant 0 is points instead of 0.
C10) Climate risk	**-2+3**	***-4 +5***	c10/1) Impact of changes in shipping traffic on GHG emissions from waterborne transport	**0**	**-1**	**-2**	**-2**	**-2**	The increase in traffic will increase the total fuel consumption of waterborne transport, thus increasing the total green emissions of waterborne transport. All of the variants are suitable for the planned traffic, however, the traffic forecast General Planner indicates that the expected increase in traffic will be much lower. There is no difference between th in this respect. The improvements will, however, allow for a much higher utilisation of the vessels' cargo space than is the case, thus allowing for a higher volume of goods to be transported without a significant increase in fuel consumpti will also result in a reduction of GHG emissions, a positive effect that has been taken into account in the scoring. Opti and III/A may have a small increase in fuel consumption due to the increase in the number of unloadings required limited width of the fairway sections, and therefore these two options scored one lower (the lowest) than Option I. N in traffic was expected for variant 0, which scored 0.
		0 +20	c10/2) Impact of shifting road transport services to shipping on total GHG emissions from transport	**0**	**10**	**10**	**10**	**10**	Each of the variants is capable of handling up to more than twice the current traffic, but there is no difference in traffi between the variants. Based on the traffic forecast provided by the General Designer, on average half of the increase traffic would come from modal shift vehicle traffic. The modal shift is entirely shifted from road traffic. The increase i growth from modal shift traffic alone (100%) would represent 20 points in the system. Correspondingly, a 50% m traffic shift represents 10 points. However, it is proposed to further investigate the expected impacts and necessary me the future.
		-4 0	c10/3) To what extent can the navigation conditions be ensured for a 1 -7% reduction in water yield according to the model simulation results?	**-4**	**0**	**0**	**0**	**0**	Based on the results of the model simulation of the expected long-term change in water flow, a 1-6% drop in wat expected on this section of the Danube by 2050, which, in the opinion of the responsible technical designer compensated by the safety margin applied in the design and the water level drop can be managed during operation reason, no specific climate change measures are envisaged at the current design stage. Given that all intervention opt been designed using the MVSZ 2018 working level, no differences can be made between the options and therefore a have been assigned 0 points and option 0 has been assigned -4 points. However, it is recommended to further inves expected impacts and necessary actions in the future.
		-4 0	c10/4) To what extent can navigation conditions be ensured in the event of variable weather conditions expected as a result of climate change?	**-4**	**-2**	**-2**	**-2**	**-2**	In the absence of intervention, Option 0 is the most vulnerable to climate change impacts and therefore scores the lo difficult to distinguish between the intervention options in this respect, as all of them aim to have a relatively lo impact, but the changes in hydrological patterns caused by climate change cannot be accurately predicted. The varia scored -2 for the perception of improvement compared to the current situation.
		-3 +2	c10/5) Consideration of adaptation measures to climate change	**-3**	**-2**	**-2**	**-2**	**-2**	The implementation of the Programme will help shipping to adapt to changing climatic and weather conditions unde water flows, but we are not aware of any specific adaptation measure to climate change. Scoring: -2 - *low level of* cons Option 0 is scored the lowest, as no adaptation measure is considered.
		-2 0	c10/6) Degree of vulnerability of technical solutions to climate change	**-2**	**-2**	**-2**	**-1**	**-1**	The increase in the frequency of low flows has been taken into account in the determination of the working water lev variations of the fairway are considered equally vulnerable to further increases in low flow periods. Stone work considered vulnerable to further projected impacts of climate change on the area. Of the planned technical interven

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III /A version.	Evaluation
									mainly the works involving the relocation of sediment, and in particular dredging, that are considered vulnerable t change, in the sense that they will be needed more frequently due to the significant channel-forming effect of flo frequency of extreme water levels on the Danube is expected to increase in the future, including the frequency of flood variant with the highest maintenance dredging needs is therefore the one with the lowest score. Accordingly, favourable are variants I and II, with almost equal amounts of dredging, and the most favourable are variants III and variant 0, no intervention is made to ensure minimum fairway parameters during low tides, and this variant is theref the lowest score.
		-3 +3	c10/7) Change in the extent of CO_2 sequestering, bioactive surfaces	**0**	**-1**	**-1**	**-1**	**-1**	As no vegetation clearance is planned in the Danube Basin under either option, it is only potentially related to land o and will not be significant.Furthermore, according to the studies carried out so far, a reduction in algal biomass is ex terms of CO2 sequestration, as a consequence of climate change and human interventions. However, it is doubt difference can be made between the variations based on current knowledge and information. All variants scored -1 ar 0 scored 0.
D) Social and acceptability issues	**-5+5**			**-0,6**	**0,3**	**0,7**	**1,1**	**1,6**	
D1) Acceptability to data subjects	**-2+1**	*-10 +5*	d1/1) Acceptability for angling	**-5**	-7	**-4**	**-2**	**-1**	Consultation with fish farmers has started. Dredging to improve navigability, the placement of dredged materia construction and modification of water management facilities are disturbing fish stocks and fishing. The expected in boat traffic will seriously damage fish stocks and negatively affect the attractiveness of fishing tourism in fisheries ma waters. Technical interventions to improve navigability will modify aquatic habitats of importance for fisheries ma and have long-term effects on the hydromorphological processes that shape and maintain these habitats. So management facilities may limit fishing opportunities (e.g. chevron dam as a fishing access point). Interventions to co for adverse changes may improve the condition of habitats of critical importance for the survival of fish stocks.
		-10 +5	d1/2) Acceptability for water sports	-7	**-4**	**-3**	**-1**	**-3**	Direct contact has not yet been established with the stakeholders. The gradual increase in the number of embankn traffic will make it more difficult to use hand-powered craft and may increase the chances of accidents occur assessment is based on the volume and extent of the works carried out close to the shore (spur, guide, chev construction, etc.). On the other hand, the increase in traffic compared to the current situation and the change i width.
D2) Compliance with the preferences of the relevant water management organisations, the National Park and the relevant Authorities	**-3+3**	*-10 +10*	d2/1) Expected reception in the National Park	**0**	**0**	**0**	**0**	**0**	Not yet known.
		-10 +10	d2/2) Acceptability for operators	**2**	**3**	**4**	7	7	Based on the discussions so far. Basically, it's the gradual increase in basin regulations and traffic that works best in The maintenance of the waterway is influenced by three factors: the volume and extent of the maintenance work to b out each year; and the traffic generated, which will affect the maintenance of the markers. In turn, the effec intervention works on the morphology of the riverbed will have an impact on both maintenance and markings.
		-5 +5	d2/3) Expected reception by water protection and environmental authorities	**0**	**0**	**0**	**0**	**0**	It is not yet known, of course.
		-5 +5	d2/4) Professional judgement in shipping, transport	**5**	**4**	**5**	**4**	**4**	Based on the discussions so far. The usability of the fairway is influenced by three factors: the traffic generated by c the width of the fairway and its dynamic nature - both in terms of tie size and time, and the impact of interventio traffic flow. medermorphological effects, which also have an impact on the pinning.
D3) Employment effects	**0+1**	*0 +10*	D3) Employment effects	**10**	**8**	7	7	7	The employment impact is influenced by four factors: the intervention works to be carried out, the annual maintenan the growth of the domestic fleet and its traffic, and the related increase in the labour demand of ports. The latte difficult to estimate at present, but the development options will differ little in this respect. It seems clear that Optio best option in this respect.
Total	**-40+60**			**7,1**	**7,1**	**11,7**	**20,4**	**24,6**	
				Excluded	**Excluded**	**Excluded**	**Excluded**	**Suggested**	

C) Stage III: Between Dunaföldvár and the border (1433,0 - 1560,5 fkm)

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III/A version.	Evaluation
A) Technical, navigational aspects, manageability of extreme water management situations	-5+30			10	22,2	25,3	26,2	26,5	
A1) Ensuring compliance with the parameters and conditions set in the target	-2+10	*0+20*	A1/1) Fairway Width	10	20	20	14	13	In variants I and II, the fairway width is 150 m everywhere, in variants III and III/A there is a width restricti
		0+10	A1/2) Sailing time on the section	0 multiplier	10	10	9	8	~200 days in version "0", 343 days in the other cases, III and III/A versions have a cut-off
		-5+20	A1/3) Hydraulic, flow conditions (flow directions, water speed)	8	12	15	17	18	The flow and velocity conditions have evolved in line with the design concept, i.e. they have improved from version. They have not changed in version III/A
		-5+10	A1/4) Increased safety of navigation (reduced risk of collisions, run aground)	4	9	9	8	7	Safety is high at full fairway width, but decreases at fairway narrows
		-10+40	A1/5) Rate of water level rise	0	32	30	28	28	In the most critical section, all variants involve raising the water level. In the other sections, the rate of wate decreases from one variant to the next
A2) Risks during implementation and operation	-1+5	*-5+20*	A2/1) Impact on aquifers, compliance with legal requirements	20	16	18	20	20	By evaluating the number, extent and classification of the protected area of interventions in the vicinity of o and prospective aquifers. The impact on the aquifer is more favourable from variant to variant
		0+10	A2/2) Complexity of implementation	0	7	9	9	10	The complexity of implementation increases with the scale of the interventions planned in the waterwa amount of masonry work requiring special technology.
		-3+20	A2/3) Flood safety	15	8	12	14	14	Flood safety decreases with the increase in the number of control works, but increases with their height setba
		-2+20	A2/4) Hydraulic conditions for ice discharge	10	15	17	19	20	Ice-discharge conditions are generally improved by the development of a uniform bed, but are also to so related to the parameters of the bed width, sinuosity
A3) Sustainability of the overall system	-1+5	*0+10*	A3/1) Annual amount of maintenance dredging	0	3	7	9	10	The most favourable option is the one with the least dredging.
		-5+20	A3/2) Navigation, navigation aspects	5	12	16	18	18	Navigation and navigation aspects are improved as flow and speed conditions improve
		-5+20	A3/3) Safety aspects	5	10	14	15	15	Operational safety is related to flow and speed conditions, fairway width and turning parameters, and improved by track corrections
A4) Smooth operation of the planned traffic growth	0+2	*0 +20*	The possibility of improving and developing the system in place	0	10	15	19	20	The system can only be improved if the implemented version achieves its goal with as little intervention as po
A5) Compatibility	-1+5	*-5+10*	A5/1) With related development plans (port development, ship park, etc.)	0	8	10	10	10	All options are consistent with the identified related development plans.
		0+20	A5/2) Compliance for river management	8	15	17	18	19	River management is more favourable when water levels and flow conditions are favourable, when the rive uniform as possible.
		-5+15	A5/3) Adaptability of the variant, adaptability to local conditions, flexibility	15	12	13	14	14	Adaptation to local conditions has included adapting to the needs of angling and sporting clubs in terms intakes, water inlets, ferry crossings
		0+5	A5/4) Flexibility to choose the date of implementation	0	2	3	5	5	The flexibility in the timing of implementation increases in proportion to the reduction in the volume of inte required, minimising interventions in the fairway.
A6) Level of adaptation to expected climate change	-1+3	*-10+30*	According to the degree of water level rise.	0	21	18	16	16	The level of resilience to expected climate change is proportional to the levelling capacity of the variant.
B) Economic, efficiency and land management issues	-5+10			0,6	0,7	3	3,5	4,7	The overall result of the economic evaluation is that Option I is by far the worst choice, with two moderat options (II, III) with almost similar scores. The best option is clearly option III A.
B1) Need for investment, one-off expenditure	0 +2	*0 +15*	B1/1) Investment, initial expenditure Ft, the higher the amount, the lower the score	x	8	10	10	12	Option 0 has no investment cost. Option I is the most expensive, nearly HUF 5 billion. Option III is 19% (HUF 4 billion) and Option II 21% cheaper (HUF 3.9 billion). The cheapest is III/A (HUF 3.7 billion).
		0 +5	B1/2) Eligibility for funding	x	2	3	3	4	The lower the costs, the more realistic the affordability
B2) Operating conditions	0 +2	*0 +8*	B2/1) Annual evolution of operating (running and maintenance) costs Estimate in Ft, taking into account maintenance cycle times	8	4	6	7	7	Option 0 includes not only the actual current costs but also the minimum IT, signage and annual ma dredging costs needed to ensure the expected operational standard, estimated at 191 M€/year. Option I i most expensive in terms of maintenance, with a total operating cost of 245 M€. Option II is 13% cheaper a with a minimal difference between Option III (203 M€) and Option III/A (199 M€), which therefore score th
		0 +8	B2/2) Financial viability and sustainability of operation	6	2	4	5	5	The lower the costs, the more realistic the affordability. If we look at it proportionally, version 0 would score but we have also taken into account that a good part of the necessary work is not being done at the moment kind of funding problem will arise.
		0 +4	B2/3) Institutional, organisational, professional and qualification background of operation	2	2	2	2	2	It's the same everywhere, because it takes several specialists to run each version.
B3) Total cost, cost-effectiveness	-1 +2	*-5 +10*	B3/1) Present value of the sum of investment, non-recurrent expenditure and operating costs over a 20-year period.	x	0	5	5	8	The score for variant 0 is not meaningful, because we calculate a development margin in the variant anal present value of Option I is the highest at HUF 5.2 bn. Alternatives II and III are 25% lower at HUF 3.9 bn, (HUF 3.5 bn) being the cheapest.
		-5 +10	B3/2) Cost-effectiveness, present value of costs per unit of turnover	x	0	5	5	8	Efficiency indicator projection based on expected turnover. All variants can meet the projected traffi Therefore the order of efficiency is the same as the order of the present value of costs.
B4) Direct economic benefits (shipping, transport, GDP, etc.)	0 +2		B4) Direct economic benefits	x	2	2	2	2	The direct economic benefit is proportional to the increase in turnover, which is assumed to be the sa variants.
B5) Indirect economic and social benefits	0 +2	*0 +4*	B5/1) Impact on water sports, fishing	0	0	0	0	0	Water sports and fishing are not expected to be positively affected. The users of fisheries water areas cannot benefit from improved navigability and increased boat traffic (with appropriate compensatory measure tourism attraction and thus sales of area fishing tickets and ancillary services can be increased)
		0 +4	B5/2) Impact on tourism	2	1	1	2	2	There are both negative and positive effects. Positive for tourist navigation, negative for possible landscape degradation

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III/A version.	Evaluation
		0 +4	B5/3) Environmental benefits	0	2	3	4	4	Transfers from road transport and other environmental benefits. If traffic growth is the same, then these ben the same. Each intervention includes measures to improve the environment, but these vary from alternative alternative.
		0 +4	B5/4) Employment benefits, contribution to the area's ability to support itself	0	4	3	3	1	Construction employment effects are temporary, permanent employment effects are the additional number operating, the higher the costs, the higher the employment benefits
		0 +4	B5/5) Economic development benefits, possibility of creating new related development programmes	0	3	2	2	2	Construction for realization the more expensive the investment, the higher the construction demand growth is the same across the variants, then the scale of port construction, the combined transport development c the same. For variant III/A, the ports have to stand the most, so some additional port development is neede
B6) Indirect economic social damage	-2 0	*-10 0*	B6/1) Additional charges on the part of the persons concerned	-10	-3	-4	-5	-5	Impact on shipping businesses Inversely proportional to water depth, passage time), so the environmentall the best economically
		-10 0	B6/2Environmental damage	x	-10	-7	-5	-2	in proportion to the potential degradation of ecosystem services.
B7) Economic risks	-2 0	*-10 0*	B7/1) Changes in shipping demand/traffic (domestic, international) do not require intervention	0	-10	-5	-5	-3	The higher the costs, the higher the economic risk
		-10 0	B7/2 Impact on certain economic activities	-2	0	0	0	0	It is not relevant for development options in this section, but the persistence of traffic barriers poses son development opportunities.
C) Protection of the environment, nature and landscape	-25+15			-0,9	-10,4	-6,8	-4,7	-2,9	
C1) Size of the area affected by the intervention	-2 0	*-10 0*	C1/1) Total area used for works (direct and indirect)	0	-10	-9	-7	-6	Although there are differences in terms of land occupation between the different options, given that no s maintenance work (neither dredging nor construction or demolition of masonry) is currently carried o section under study, apart from a few isolated sites, all intervention concepts could result in significant d compared to the zero option. In the context of the project, the waterway was designed with narrowings III/A in order to reduce the amount of work to be carried out in the riverbed, and therefore Option III preferred option based on our analysis. Variant III has slightly more interventions, while Variants II a significantly more interventions, and is therefore the least favourable from an occupancy point of view.
		-10 0	Dredging area (and area for disposal of dredged material)	0	-10	-10	-7	-5	Dredging is included in the variation assessment in several aspects, because this type of intervention has significant direct impact, in terms of habitat protection, aquifer protection, soil protection, hydromorpho indirectly, in many other environmental disciplines. In terms of its impact, it is the surface area of the w riverbed rather than its volume that matters. After the zero option, in which no dredging is considered, Op which envisages the most narrowed fairway, has the least surface area of dredging and is therefore favourable, while Options II and I require significantly more dredging and are therefore the least favourable.
C2) Difference in fairway width compared to the current situation	0 +2	*0+20*	C2) Difference in fairway width compared to the current situation	0	0	0	1	2	The 2019 fairway designation plan already includes a 150 m wide fairway, so on this section the plan planned to relocate the fairway and narrow it in some places. However, it can be said that the width of th does not deviate significantly from the current width in any of the variants. The most favourable variant is the minimum width, followed by III and then I and II, which are considered to be of equal width.
C3) Impact on aquifers	-4 0	*0 or 0 multiplier*	c3/1 Dredging in the outer/inner protection zone of an operational aquifer	0	0 multiplier	0 multiplier	0	0	According to Annex 5 of the Government Decree No. 123/1997 (VII. 18.) on the protection of aquifers, remot and water installations for drinking water supply, it must be taken into account in the planning that no e work (activities affecting the cover or aquifer) may be permitted in the inner and outer protection areas of t filtered **As dredging is planned for 4083 m2 in the outer protection zone of the Foktő-Barákai aquife variants I and II, the above criterion is not met in variants I and II and therefore ca implemented from a river basin protection point of view.** No dredging is planned in the outer protection zone of an operational aquifer in III and III/A.
		-10 0	c3/2 Dredging [m2] in hydrogeological protection area A/B of operating aquifer	0	-2	-2	-1	-1	With the exception of Alternative 0, the same amount of bed excavation is foreseen in the hydrogeological p area A/B of the aquifer in Alternatives I and II, slightly less in Alternative III and significantly less in A III/A. As the exposure in variants I and II is ~2% of the basin cross-section of the hydrogeological protecti for the Cape-Baraka aquifer, both variants scored -2. For variants III and III/A, the extent of the overlap small water body does not exceed 1% and therefore the minimum score of -1 was assigned.
		-10 0	c3/3 Maintain dredging in the protection zone of (remote) aquifers	0	0	0	0	0	The dredging volumes required to provide the depth of the fairway cannot be accurately predicted at this st design because the extent of the dredging is a function of a number of future shaping effects, whic inaccurately predicted. However, even if a 20% annual maintenance dredging rate, estimated on the basis experience with the fairway, is assumed, no difference can be made between the variants, as all variants have minimum dredging rate (less than 1%) planned for the distant water protection area.
		-10 0	c3/4 Sedimentation in the protection zone of an operating aquifer	0	0	0	0	0	Based on the model calculations carried out, no significant sedimentation of sediment is expected in the oute protection zone of the operating aquifer.
		-10 0	c3/5 Sinkhole in the protection zone of an operating aquifer	0	0	0	0	0	Based on the model calculations carried out, no significant sedimentation is expected in the outer or inner p zone of the operating aquifer.
C4) Adverse environmental impacts of the deployment of the system	-3 +1	*-5 0*	c4/1) Impact of deposition on air quality and noise and vibration emissions	0	-5	-4	-4	-3	The interventions planned in each version, involving the operation of machinery and transport needs, were t account. In addition to the total volume of each work, we have also tried to take into account the differen planned locations. As a starting point, the possible impact on residential areas within a radius of 50 examined. Variations involving a higher volume of work or interventions involving work in the vicinity populated areas were given lower scores. The worst option in this respect (Option I) received the lowest s against which the other options were compared. Variant 0 scores 0 points.
		-3 0	c4/2) Causation, avoidability of water quality problems	0	-3	-2	-1	-1	Any construction work in a riverbed during construction has the potential to cause water quality problem extent of this is determined by the extent of the area of construction activity in the riverbed. As a result of the it was concluded that the most favourable option is Option III/A, while the least favourable option is Option

Criteria groups	Point scale	Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III/A version.	Evaluation
	-5 +10	c4/3) Impacts on the hydromorphological conditions of the riverbed (e.g. risk of deepening of the riverbed, risk of water level reduction)	**0**	**-2**	**-1**	**-1**	**-1**	From a hydromorphological point of view, the expected changes during construction can be considered in th of the way the artificial stone works are constructed and the disturbance of the natural bed by the intervent bed and its temporary or long-term effects. In summary, any intervention that impairs or compromises the of the natural conditions of the riverbed will have a negative impact on the hydromorphology of the Dan design of works that help to maintain diversity and ensure the navigational purpose with the least interference and use of artificial works has little adverse effect, and some measures, such as spur cuts, c positive effect on existing artificially regulated stretches. The most favourable options are III, III/A, II, equivalent, and finally Option I is the least fa In terms of the effects on bed deepening and water level changes and the actual effects on the bed morph clear scaling and scoring can be given on the basis of the current studies, however, as the degree of increases and although positive effects are expected, artificial works are introduced into the bed, the e assumed to be rather negative.
	-3 0	c4/4) Impact of the dredging activity on the geological medium	**0**	**-3**	**-2**	**-1**	**-1**	The volume requirement for gas dredging in Option III/A is almost one third of the dredging volume fo Option I. Thus, the most favourable variant is III/A, followed by III not much more, then III, then II, and the I, which is the least favourable, since it is more than twice as much as variant II.
	-2 0	c4/5) Problems and management of waste from construction works	**0**	**-2**	**-1**	**-1**	**-1**	Existing data do not include information on the amount of waste generated during construction works. The to distinguish between the different options is to assume that the option that involves more material construction, reconstruction or demolition of more river control features generates more waste. The sediment is not considered waste because it is deposited in its original environment, the river. Furthermore, that the material left over from the dismantled hydraulic structures will be used in the construction process. Most of the material handling (217 thousand m^3) takes place in variant I. In Variant III 163 thousand m^3, in 160 thousand m^3 and in Variant III/A 151 thousand m^3.
	-3 0	c4/6) Disturbance of direct water uses	**0**	**-3**	**-2**	**-2**	**-1**	The disruptive impact of construction activity is related to both the land use, duration and nature of the wor affecting the shipping lane are more likely to disturb navigation itself, while construction and demolition wo to the shore are more likely to disturb those using the areas. The area affected is known. Time is another i factor. This may in theory be related to the amount of work required for the variations, but also depen example, how many sections are worked on at the same time.
	-3 0	c4/7) Summary of the effects on the settlement environment	**0**	**-3**	**-1**	**-1**	**-1**	The negative impacts are primarily related to specific construction activities (thus affecting coastal settlem secondarily to the expected increase in vessel traffic. There are 7 municipalities in the study area where inte are planned in the vicinity of the construction (residential areas or recreational areas, enclosed areas): Du Ordas, Sükösd, Baja, Dunafalva, Mohács, Szeremle, but 6 municipalities are directly affected by the environmental impacts of the construction in the case of Option I, 3 in the case of Option II and 2 in th Options III and III/A. Furthermore, a distinction can be made on the basis of the scale of the intervent dredging, total amount of stone moved, vegetation clearance), again with Option I being the least favou Option II, the total amount of stones moved is slightly lower than in Options III and III/A, but the a dredging is more significant. Variant III/A requires the least intervention (except for the construction of where Variant II is the most favourable). Overall, there is no significant difference between variants II, III an
	-3 0	c4/8) Archaeological and cultural heritage impacts	**0**	**0**	**0**	**0**	**0**	There are few areas affected by dredging and intervention, the critical sites are not affected, and the iner only slightly affected. In other cultural heritage terms, one monument site is affected under all alternativ monument is located in the Danube bed (Dunafalva, Sontra Florentiam harbour fortress). However, the mo not affected in any of the options. In the case of World Heritage sites, the Roman Limes is affected. 5 of the sites of local importance are located close to the coast and are not expected to be affected by any of the optio Mádi-Kovács Castle; Őcsény, former Archbishop's summer house; Baja, István Türr memorial; Mohács, building and Selyemgyár).
	-3 0	c4/9) Transboundary impacts	**0**	**0**	**0**	**0**	**0**	In terms of transboundary impacts, we could not distinguish between the variations in terms of constru existence of works or changes in vessel traffic. The closest construction area to the border for all variants Mohács, more than 10 km from the border, and the closest area proposed for dredging is near Paks, 80 km border.
C5) Conservation impacts during construction and maintenance	**-7 0**	*-5 0* c5/1) Affected protected natural area of national importance (extent of the direct and indirect impact of the variant on protected areas)	**0**	**-4**	**-3**	**-3**	**-3**	In terms of the impact on the protected natural area of national importance, Option I is the least favourab the option that will have the longest direct physical degradation impact on a protected natural area o importance during the construction phase. There is no appreciable difference between the other variants since all of them affect the same sections of the river, but the type and scale of the intervention is dif particular, the assessment of the impact on the construction area was -2 for Option I and -1 for the othe examined. The operational scope was scored -5 for all variants, as the increase in the volume of navigation th expected after the development during operation will affect the whole stretch and its wildlife. The final as was based on the average of the scores for the construction and operational phases, rounded upwards as onl number can be given. This is how the scores of -4 and -3 were obtained.
		-5 0 c5/2/1) Natura 2000 site affected (extent of the direct and indirect effect of the variant on Natura 2000 sites)	**0**	**-4**	**-3**	**-3**	**-3**	Regarding the impact on Natura 2000 sites, Option I is the least favourable, as it is the option with the long physical degradation of Natura 2000 habitats during the construction phase. There is no appreciable between the other options considered, as all options affect the same sections of the river with the same reefs, but the type and scale of intervention differs. Separately, the assessment of the impact on the co impact area was -2 for Option I and -1 for the other options assessed. The operational scope was scored variants, as the increase in the volume of navigation that can be expected after the development during oper affect the whole stretch and its wildlife. The final assessment was based on the average of the score construction and operational phases, rounded upwards as only a whole number can be given. This is how the -4 and -3 were obtained.
		-10 0 C5/2/2) Expected impact on candidate species of Community importance during construction and operation	**0**	**-10**	**-8**	**-6**	**-4**	There are significant differences between the variants in terms of the impact on the candidate animal species of Community importance. The assessment typically takes into account the negative impacts associ the construction, or the impacts on hydromorphological conditions and hence on organisms releva operational phase associated with the construction, and does not weigh the impacts of increased vessel tr

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III/A version.	Evaluation
									increase in traffic may occur in the operational phase as an effect independent of the variation (e.g. deter economic factors) and, if a significant increase in traffic were assumed, the differences between the v independent of traffic but otherwise real, would be completely masked. In terms of this sub-criterion, Optio scores the lowest (-10 points), providing the required width for the entire length of the fairway using con control works. In contrast, the least unfavourable rating was given to Option III/a, which includes m waterway narrowing to minimise dredging interventions and uses chevron dike type diversion structures conventional diversion structures, which are expected to have a more favourable impact on wildlife protec construction, while also seeking to minimise the use of these types of structures.
		-5 0	C5/2/3) Expected impact on candidate habitat types of Community importance during construction and operation	**0**	**-2**	**-1**	**-1**	**-1**	Adverse impacts on candidate habitat types of Community importance are mainly associated with transport dumping and working on the floodplain bordering the mid-water bed. Direct impacts are likely to occur mai nearshore section of the traditional diversion works and in the coastal zone of the floodplain associated installation of guide works. In the absence of an organisational plan, at the current planning stage, the in been estimated by experts on the basis of the quantities of works to be constructed and the proportion of types of works to be installed for each variant. Option I, which uses conventional diversion structures con the mid-water embankment, received a less favourable rating (-2).
		-10 0	c5/3 Number of other rare character species, number of species of special conservation concern and species of Community importance and the nature and extent of the expected impact on their populations	**0**	**-9**	**-7**	**-5**	**-3**	There is also a significant difference between the variants in terms of the impact on other rare characte protected species and specially protected species. The assessment typically takes into account the negativ associated with the construction, or the impacts on hydromorphological conditions and hence on biota relev operational phase of the construction, and does not weigh the impacts of increased vessel traffic. The in traffic may occur in the operational phase as an effect independent of the variation (e.g. determined by factors) and, if a significant increase in traffic were assumed, the differences between the variations, indep traffic but otherwise real, would be completely masked. In terms of this sub-criterion, Option I scores the points), providing the required width for the entire length of the fairway. In contrast, the least favourable r given to Option III/a, which includes fairway narrowings over significant lengths to minimise dredging inte and uses chevron dikes instead of conventional diversion structures, which are expected to have a more f impact on wildlife protection after construction.
		-10 0	c5/4) Extent of habitat loss in the Danube river basin as aquatic habitat (expected extent of loss)	**0**	**-4**	**-2**	**-2**	**-2**	Many of the conventional diversion works, which reach all the way out to the mid-water margins, cause between these parallel works to fill up in the longer term. This phenomenon can also be observed in ma along the Danube between parallel diversion works extending towards the middle of the river. As the su processes progress, the recharging riverbeds become increasingly submerged and then reforested, gradua their habitat functions for the aquatic fauna of the Danube. In terms of this criterion, Option I is clearly favourable (-4), as it mainly uses conventional diversion structures up to the edge of the mid-water bed, other options studied use chevron dams in several sections with navigational problems.
		-6 0	c5/5) Nature and extent of the impact on the habitat diversity of the Danube river basin (can we say now?)	**0**	**-5**	**-2**	**-2**	**-1**	In general, habitats with higher diversity, greater small- and medium-scale heterogeneity and higher ha diversity tend to provide suitable habitat for a more diverse, species-rich community. Experience has sh dredging and the installation of parallel diversion structures extending towards the middle of the bed and c to the shoreline of the mid-water bed will result in a more homogeneous bed and a reduction in habitat hete In this criterion, Option I is clearly the least favourable (-5), due to the significant area of the bank a dredging as a result of the full-width fairway and the high proportion of the bank affected by silta construction as a result of the use of conventional diversion structures. The least adverse effects are ob Option III/a (-1), due to the lowest volume of dredged material and the use of chevron dikes.
		-9 0	c5/6) Nature and magnitude of the impact on the ratio of artificial to natural soils (can we tell now?)	**0**	**-3**	**-2**	**-3**	**-2**	The assessment of each alternative is negatively affected by the increase in the amount of hydraulic engineer to be installed, while the negative effects are mitigated by the demolition of existing stone works. The s derived by summing the quantities of materials used for construction and demolition. Based on this Alternatives II and III/a are the least negatively rated. Based on available experience and survey results, the of alien and invasive species is facilitated by the presence of hydraulic engineering stone structures, which likely to colonise than natural substrates in the affected reach.
		-10 0	c5/7) Nature and extent of the impact on the water balance of the Danube habitats (from tributaries to habitats further away from the Danube affected by the Danube water level)	**0**	**0**	**0**	**0**	**0**	As a result of shallowing, rivers are draining groundwater from surrounding areas at ever lower levels, resu significant drop in groundwater levels in areas along their banks. Depending on the hydrological characteris areas concerned, the magnitude of the long-range effects of groundwater level declines associated with periods can be very significant. This is also the case along the domestic Danube section. Declining groundwa have a negative impact on the water balance of groundwater-dependent ecosystems in the affected areas, water scarcity and consequent degradation of ecosystems. A key design consideration was to avoid this impact. The information available at the current planning stage does not indicate that any of the alterna cause such adverse effects.
C6) Environmental impacts due to traffic changes	**-2+4**	***-7 0***	c6/1) Consequences of emissions (air pollutants, noise) due to increased shipping traffic	**0**	**-6**	**-6**	**-7**	**-7**	All the variants are suitable for the design traffic, so there is no difference between the variants in this res additional loads caused by the need for detours due to the limited width of the riverbed sections have been t account for variants III and III/A, which therefore scored one point lower than the other two. No traffic inc assumed for variant 0.
		-3 0	c6/2) Changes in bank and shore erosion (increased traffic, decreased narrower fairway)	**0**	**-3**	**-3**	**-2**	**-2**	As each of the options aims to improve navigability, there is no significant difference in traffic growth, with c and III/A having a more moderate impact than the others, as the significant narrowing of the fairway in thes will discourage some vessel traffic, but the impact of this option is not negligible, as traffic growth can be here as well.
		-5 0	c6/3) Landscape and land use changes	**0**	**-5**	**-4**	**-3**	**-2**	The known interventions are in the riverbed, so at this planning stage it is difficult to assess the likely trans of the riparian areas. The entire Danube riverbed is part of the national landscape protection area, so it is no to differentiate between the changes on this basis. Differences between the variants at this planning stage ca on the basis of the scale of the interventions, their location (in particular: the impact on protected natural a the expected amount of vegetation destruction. The amount of vegetation destruction in Variant I is abou high as in all other variants (which are identical). Protected natural areas of national importance are affec variants, given that the Danube riverbed and its surroundings are part of the Danube-Drava NP on th

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III/A version.	Evaluation
									between the border with Friesland. However, the magnitude of the interventions in the national park areas I is much higher than in the other variants, which justified the lower scoring. The differences between varia III/A in terms of landscape and land use are based on the scale of dredging and the total area requiremer decrease from variant II towards variant III/A, which justified the increasingly favourable scoring.
		-5 +5	c6/4) Ecological impacts of vessel traffic (increased traffic increased, narrower waterway decreased)	**0**	**-5**	**-5**	**-5**	**-4**	According to the Port Master Plan Strategy, the share of inland waterway freight transport could reach 10% which represents an increase of at least 2-2.5 times the current inland waterway transport. This is cer increase that could have a serious negative impact on the Danube's biota. As all options aim to improve na there is no significant difference in traffic growth, with only Option III/A having a more moderate impact others, as the significant narrowing of the fairway in this option will discourage some vessel traffic, but the this option is not negligible, as traffic growth can be expected here as well.
		0 +15	c6/5) Total emissions reduction due to offsetting	**0**	**8**	**8**	**8**	**8**	All the variants are suitable for the design traffic, so there is no difference between the variants in this res options III and III/A, the impact of the diversions required due to the limited width of the riverbed s negligible compared to the impact of the road traffic generated, and therefore each option scores the same. the traffic forecast obtained from the General Designer, on average half of the increase in vessel traffic is due shift vehicle traffic. The modal shift is entirely shifted from road traffic. The increase in forecast growth fro shift traffic alone (100%) would represent 15 points in the system. Accordingly, a 50% modal shift tr represents 7.5 points, rounded up to 8 points. In variant 0, no shift was considered, 0 points were assigned.
		0 +10	c6/6) Change in total transport energy demand	**0**	**10**	**10**	**9**	**9**	Because of the lower energy requirements of water transport compared to road transport, all but the zero va positive values. This is due to the fact that, in addition to the shift from road, even if no shift is expected, i.e goods arrive by water than before, they can be carried by vessels with a larger draught. More draught me energy consumption for each vessel, but because fewer of them will be needed, the overall fuel consum transporting goods by ship will be reduced. In the case of transhipment (which is currently assumed) the effe more positive, the more goods are transported by water, the lower the overall energy demand for transpo whichever option helps to transport more goods is more favourable in this respect. On the basis of the in available, options I, II and III can also provide the necessary increased volume of goods transported, but o and IIIa may be less favourable in that additional energy consumption can be expected due to conge stoppages. It should be added, however, that this criterion depends to a large extent on the modernity ar consumption of the fleet, which does not depend on the variants with each intervention. In addition, the way goods are transported may be influenced by external factors which cannot be predicted at present.
		0 +10	c6/7) Changes in land take resulting from congestion	**0**	**5**	**5**	**4**	**4**	There is not enough information available at this stage to investigate this in detail, but for the time bein compare the different variants in terms of transport time, navigation aspects and fairway width, i. throughput. At this stage, this is the same for variants I and II, so no distinction is made between them. In t variants III and III/a, the potentially longer running time may cause some differences. In principle, howev not assume that land take resulting from road construction is solely for reasons that can be diverted to water all routes may be so flexible), so we do not give a maximum score to either variant.
C7) Environmental impacts on the operation of the waterway, maintenance of the new status, impacts of the existence of the new system.	**-2 +3**	*-15 0*	c7/1) Effects of carrying out maintenance dredging	**0**	**-15**	**-8**	**-5**	**-4**	The dredging volumes required to provide the depth of the fairway cannot be accurately predicted at this st design because the extent of the dredging is a function of a number of future shaping effects, whic inaccurately predicted. Nevertheless, based on the design experience of the fairway, these works can be approximately, and an annual maintenance dredging of 20% of the total design value has been calculated. Th requirement for dredging in Variant III/A is almost one third of the dredging volume foreseen in Variant I. most favourable variant is III/A, followed by III not much more, then II, and then I, which is the least fa since it is more than twice as much as even variant II.
		0 +10	c7/2) Opportunities for improved water supply to tributaries	**0**	**4**	**4**	**4**	**4**	No distinction can be made between the variants, because all variants include the same tributary interventio same recharge can be ensured in all variants. The reason why the variants do not score maximum points is minimal interventions in the tributaries are planned at the design stage, and water supply is likely to minimally or stagnate.
		0 +10	c7/3) Preservation of the function of the aquatic habitat of small and medium-sized water bodies	**0**	**0**	**2**	**2**	**2**	For variant I no chevron dams are planned, for the other variants they are, but there is no difference in the n chevron dams for these variants, so the score is the same. It is important to note that Option 0 scores 0 be score is influenced by the number of chevron dams, and in this option there are no chevron dams on th However, this does not mean that in terms of habitat number, variant 0 is the same as predicted for varia though both variants score 0. This ratio refers only to the number of chevron dams.
		-5 +10	c7/4) Changes in the evolution of ecosystem services in the new state after the intervention	**0**	**-2**	**-2**	**-1**	**-1**	Also in this section, the least intrusive Alternative III/A has the lowest negative impact on ecosystem service due to the lower volume of riverbed intrusions and structures. However, similar to the above sections, ev Alternative III/A, the overall negative impacts on ecosystems and their services are still significant.
C8) Assessment under CCI 4.7	**-1+2**	*-5 +10*	c8/1) The status of the affected water bodies is expected to be downgraded in the course of the WFD 4.7 analysis	**5**	**0**	**0**	**2**	**3**	Invasions *between the Danube Danube estuary* and the Danube *Sió estuary and the* Danube *Sió border* affect the biological and morphological characteristics of water bodies in all variations. Changes in bo parameters are mainly determined by dredging activities, the extent of bed deepening and the constr hydraulic structures. Among the biological communities, algae are generally the most dependent on water c as water chemistry does not change significantly during construction or operation, and therefore no s changes are expected. Macroinvertebrates are not affected as no changes in the riparian vegetation are expe and aquatic invertebrates will be locally affected. It is likely that these negative impacts will be negligible for water bodies. Negative changes are expected in some morphological characteristics, regularity, bed materi significant changes are expected. It is unlikely that the magnitude of change will reach the category of det for any of the quality parameters. Neither for biological characteristics nor for morphological characteristics will be the basis for a final decision on the need for a detailed assessment of the EIA 4.7.
		0 +5	c8/2) Whether appropriate mitigation measures have been applied	**X**	**0**	**0**	**3**	**4**	No mitigation is interpreted for version 0. There are no mitigation measures for the CCI in Versions Mitigation measures for environmental, water protection impacts are already included in versions III and III this point of view, Option III/A is the best.
		-5 +5	c8/3) Threatening or supporting the achievement of the objectives set for the	**x**	**-3**	**-2**	**-1**	**0**	Not interpretable for version 0. The two water bodies concerned are subject to different VGT2 measures. T measures whose implementation is affected by the project interventions are described below (+ for posit

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III/A version.	Evaluation
			water bodies concerned						neutral or no effect). (1) Danube between the Dunaföldvár-Sió estuary, (2) Danube between the Sió estuary and the border 6.2. Establishment of appropriate vegetation in the surf zone 0(2) 6.3a One-off removal of silt and vegetation accumulated in watercourses and standing waters 0 (2) 6.5 Gradual achievement and maintenance of good ecological status and potential of watercourses and waters through maintenance works 0 (1,2) 6.6 Dismantling of in-stream facilities that have lost their function, progressively achieving good ecological s potential of the environment 0(1,2) 6.8 Improving the water supply to the floodplain and floodway + (1), 0 (2) 6.9 Reducing the impact of deeper than natural river beds and the resulting low and medium water level sub (1, 2) 6.9.a Raising the water level by means of bottom dikes and bottom fins, with silting up of the bed between t 2) 6.12.3 Reconstruction and maintenance of in-stream facilities, including the use of near-natural solu materials + (1, 2) 6.13. Adaptation of navigation to river or still water conditions 0 (1, 2) 7.1 Modification of the inland drainage system 0 (1) 33.2 Special hydromorphological measures to improve the status of protected natural areas, includin regulation of water abstraction, water management and water recharge to meet conservation needs + (1,2) As there are no CCI objectives that are threatened by the investment, a detailed 4.7 assessment is not expe necessary due to the barriers to the implementation of the measures. Overall, the difference between the v determined by the amount of dredging activity and technical interventions.
C9) Environmental risks during the operation of the established fairway	**-2 0**	***-5 0***	c9/1) Changes in the risk of shipping accidents due to traffic growth and the new fairway	**0**	**-1**	**-1**	**-2**	**-2**	For the assessment of this criterion, the starting point was variant 0, where the number of days per year of r was not taken into account. The other 4 variants under consideration all have the same increase in traffic (3 the theoretical maximum traffic capacity differs between the variants, the realistic traffic volume expected to pass unhindered is expected to be expected in all four variants), but in variants III and III/a, the fairway narrowed, relocated or unidirectional (which is the result of an even further narrowing). Hence, the traffic do not affect the differences between the variants, the traffic increase itself is not so large as to mu probability of accident risks, so the score itself is close to 0. The difference between the variants is affect waterway narrowing, so that the variants III and III/a score worse.
		-5 0	c9/2) Dredging risks	**0**	**-5**	**-3**	**-1**	**-1**	The dredging volumes required to provide the depth of the fairway cannot be accurately predicted at this st design because the extent of the dredging is a function of a number of future shaping effects, whic inaccurately predicted. Nevertheless, based on the design experience of the fairway, these works can be approximately, and an annual maintenance dredging of 20% of the total design value has been calculated. Th requirement for dredging in Variant III/A is almost one third of the dredging volume foreseen in Variant I. most favourable variant is III/A, followed by III not much more, then II, and then I, which is the least fa since it is more than twice as much as even variant II.
		-5 0	c9/3) Increased likelihood of water quality incidents (e.g. ship discharges)	**0**	**-2**	**-2**	**-3**	**-3**	For the evaluation of this criterion, the values and methodology of criterion C9/1) have been adopted, difference that each variant scored one value lower. This can be explained by the fact that water pollution i caused by accidental events, but also by other types of pollution.
		-5 0	c9/4) Development of critical local air quality situations	**-1**	**-2**	**-2**	**-2**	**-2**	The increase in shipping traffic will inevitably affect air quality because of the increase in emissions. In loca are inherently less favourable for geographical or anthropogenic reasons, this may contribute to critical situa worsen an already unfavourable situation). In this respect, no distinction can be made between the options them are suitable for the planned traffic. To illustrate that there may already be locations where air sometimes a concern due to existing vessel traffic, among other reasons, option 0 has been given a score of than 0.
C10) Climate risk	**-2+3**	***-4 +5***	c10/1) Impact of changes in shipping traffic on GHG emissions from waterborne transport	**0**	**-1**	**-1**	**-2**	**-2**	The increase in traffic will increase the total fuel consumption of waterborne transport, thus increasing greenhouse gas emissions of waterborne transport. All of the variants are suitable for the planned traffic, hov traffic forecast from the General Planner indicates that the expected increase in traffic will be much lower. T difference between the variants in this respect. The improvements will, however, allow for a much higher uti the vessels' cargo space than is currently the case, thus allowing for a higher volume of goods to be tra without a significant increase in fuel consumption, which will also result in a reduction of GHG emissions, effect that has been taken into account in the scoring. Options III and III/A may have a small increa consumption due to the increase in the number of diversions required due to the limited width of the basin and therefore these two options scored one lower than the others. For option 0, no change in traffic is expec scores 0. (Note that the increase in emissions due to increased traffic will be partly compensated by the more modern, energy-efficient vessels (forced by stricter environmental requirements).)
		0 +20	c10/2) Impact of shifting road transport services to shipping on total GHG emissions from transport	**0**	**10**	**10**	**10**	**10**	Each of the variants is capable of handling up to more than twice the current traffic, so there is no differenc the variants in this respect. As far as we know at present, congestion on all roads is expected if the project is However, this is highly unproven and its magnitude cannot be estimated at this stage. The planned in congestion of about 7.7 % compared to current levels may not be feasible, but on the other hand it may not b at the expense of road transport. The planned increase and its transfer from road only would represent 20 the system. Accordingly, we are now making a conservative estimate. However, it is proposed to further a likely impacts and necessary measures in the future. There is no consensus among experts working on this is
		-4 0	c10/3) To what extent can the navigation conditions be ensured for a 1 -7% reduction in water yield according to the model simulation results?	**-4**	**0**	**0**	**0**	**0**	Based on the results of the model simulation of the expected long-term change in water flow, a 1-6% drop flow is expected on this section of the Danube by 2050, which, in the opinion of the responsible technical can be compensated by the safety margin applied in the design and the water level drop can be manag operation. For this reason, no specific climate change measures are envisaged at the current design stage. C all intervention options have been designed using the MVSZ 2018 working level, no differences can be mad

Criteria groups	Point scale		Component sub-criteria	0 changes.	I. variables.	Version II.	Version III.	III/A version.	Evaluation
									the options and therefore all options have been assigned 0 points and option 0 has been assigned -4 points. it is recommended to further investigate the expected impacts and necessary actions in the future.
		-4 0	c10/4) To what extent can navigation conditions be ensured in the event of variable weather conditions expected as a result of climate change?	**-4**	**-2**	**-2**	**-2**	**-2**	In the absence of intervention, Option 0 is the most vulnerable to climate change impacts and therefore lowest. It is difficult to distinguish between the intervention options in this respect, as all of them aim relatively long-lasting impact, but the changes in hydrological patterns caused by climate change cannot be predicted. The variants are all scored -2 for the perception of improvement compared to the current situation
		-3 +2	c10/5) Consideration of adaptation measures to climate change	**-3**	**-2**	**-2**	**-2**	**-2**	The implementation of the Programme will help shipping to adapt to changing climatic and weather conditi current water flows, but we are not aware of any specific adaptation measure to climate change. Scoring: -2 *of* consideration. Option 0 is scored the lowest, as no adaptation measure is considered.
		-2 0	c10/6) Degree of vulnerability of technical solutions to climate change	**-2**	**-1**	**-1**	**0**	**0**	The increase in the frequency of low flows has been taken into account in the determination of the work level, but all variations of the fairway are considered equally vulnerable to further increases in low flow perio works are not considered vulnerable to further projected impacts of climate change on the area. Of the technical interventions, it is mainly the works involving the relocation of sediment, and in particular dred are considered vulnerable to climate change, in the sense that they will be needed more frequently d significant channel-forming effect of floods. The frequency of extreme water levels on the Danube is ex increase in the future, including the frequency of floods, and the variant with the highest maintenance dredg is therefore the one with the lowest score. Accordingly, Option I is the least favourable, Option II is favourable and Options III and III/A are even better. In variant 0, no intervention is made to ensure fairway parameters during low tides, and this variant is therefore given the lowest score of 0.
		-3 +3	c10/7) Change in the extent of CO_2 sequestering, bioactive surfaces	**0**	**-2**	**-1**	**-1**	**-1**	Plant eradication is the same (and small) for variants II, III and III/a. Slightly more vegetation eradication i for Variant I, so it receives the lowest score. By definition, no such activity is found in Variant 0 (0 points). to the analyses carried out so far, a reduction in the amount of algal biomass is also expected in term sequestration, due to the effects of climate change and human interventions. However, it is doubtful that a can be made between the variations based on current knowledge and information. A monitoring plan is pr address this uncertainty and problem.
D) Social and acceptability issues	**-5+5**			**-0,6**	**0,7**	**0,9**	**0,9**	**1,2**	
D1) Acceptability to data subjects	**-2+1**	*-10 +5*	d1/1) Acceptability for angling	**-5**	**-7**	**-6**	**-5**	**-4**	Consultation with fish farmers has started. Dredging to improve navigability, the placement of dredged ma the construction and modification of water management facilities are disturbing fish stocks and fishing. The increase in vessel traffic will seriously damage fish stocks and negatively affect the attractiveness of t tourism in the fisheries management waters. Technical interventions to improve navigability will modi habitats of importance for fisheries management and have long-term effects on the hydromorphological that shape and maintain these habitats. Some water management facilities may limit fishing opportun chevron dam as a fishing access point). Interventions to compensate for adverse changes may improve the of habitats of critical importance for the survival of fish stocks.
		-10 +5	d1/2) Acceptability for water sports	**0**	**-5**	**-3**	**-3**	**-2**	Direct contact has not yet been established with the stakeholders. The gradual increase in the n embankments and traffic will make it more difficult to use hand-powered craft and may increase the c accidents occurring. The assessment is based on the volume and extent of the works carried out close to (spur, guide, chevron dam construction, etc.). On the other hand, the increase in traffic compared to th situation and the change in fairway width.
D2) Compliance with the preferences of the relevant water management organisations, the National Park and the relevant Authorities	**-3+3**	*-10 +10*	d2/1) Expected reception in the National Park	**x**	**0**	**0**	**0**	**0**	Not yet known.
		-10 +10	d2/2) Acceptability for operators	**2**	**5**	**6**	**6**	7	Based on the discussions so far. Basically, it's the gradual increase in basin regulations and traffic that wor this case. The maintenance of the waterway is influenced by three factors: the volume and extent of the ma work to be carried out each year; and the traffic generated, which will affect the maintenance of the marker the effects of the intervention works on the morphology of the riverbed will have an impact on both mainte markings.
		-5 +5	d2/3) Expected reception by water protection and environmental authorities	**x**	**0**	**0**	**0**	**0**	It is not yet known, of course.
		-5 +5	d2/4) Professional judgement in shipping, transport	**-3**	**5**	**5**	**4**	**4**	Based on the discussions so far. The usability of the fairway is influenced by three factors: the traffic gen changes in fairway width and its dynamic nature - both in terms of tie size and time, and the effe interventions on the morphology of the bed, which also affect the setting of the markings.
D3) Employment effects	**0+1**	*0 +10*	D3) Employment effects	**0**	**10**	7	7	7	The employment impact is influenced by four factors: the intervention works to be carried out, th maintenance works, the growth of the domestic fleet and its traffic, and the related increase in the labour d ports. The latter two are difficult to estimate at present, but the development options will differ little in this seems clear that Option I is the best option in this respect.
Total	**-40+60**			**9,1**	**13,3**	**22,4**	**25,9**	**29,5**	
				Excluded	**Excluded**	**Excluded**		**Suggested**	