

Together with Passion



LOW WATER LEVEL

- AN APPROACH FOR SOLUTION



WATER LEVEL STATION KAUB

HYDRAULIC PARAMETERS

	Minimum navigable channel depth	Equivalent water level
Gauge station Kaub	190 cm	78 cm

DAYS PER YEAR WITH A WATER LEVEL BELOW EQUIVALENT WATER LEVEL

	2015	2016	2017	2018	2019	2020	2021	Average
Gauge station Kaub	29	19	28	107	0	0	10	28



GAUGE STATION KAUB BELOW 1,20M

	days
2013	5
2014	12
2015	116
2016	76
2017	53
2018	146
2019	16
2020	85
2021	75
2022 (status mid december)	109
in total	693

EFFECTS OF WATER LEVEL - EXAMPLE “RHENUS DORTMUND”

maximum loading capacity:

5.270 t

loading capacity at Kaub 1,20m:

2.271 t → shortfall tonnage 2.999 t

loading capacity at Kaub 1,20m with two additional barges:

4.620 t → shortfall tonnage 650 t



ADDITIONAL TONNAGE WHEN USING THE CONVOY WITH TWO ADDITIONAL BARGES

	days Kaub below 1,20m	additional possible tonnage
2013	5	11.745 t
2014	12	28.188 t
2015	116	272.484 t
2016	76	178.524 t
2017	53	124.497 t
2018	146	342.954 t
2019	16	37.584 t
2020	85	199.665 t
2021	75	176.175 t
2022	109	256.041 t
Total	693	1.627.857 t

SAMPLE CALCULATION 2018

“RHENUS DORTMUND”

Voyage date	Kaub	tonnage	Freight charges	LWS*	Total freight charges	Voyage date	Kaub	tonnage	Freight charges	LWS	Total freight charges		
1.	1.1	333	5.270	36.890,00 €	- €	36.890,00 €	19.	9.7	168	3.029	21.203,00 €	- €	21.203,00 €
2.	12.1	471	5.270	36.890,00 €	- €	36.890,00 €	20.	20.7	107	1.895	13.265,00 €	5.306,00 €	18.571,00 €
3.	22.1	523	5.270	36.890,00 €	- €	36.890,00 €	21.	30.7	81	1.521	10.647,00 €	6.388,20 €	17.035,20 €
4.	2.2	437	5.270	36.890,00 €	- €	36.890,00 €	22.	10.8	70	1.335		40.000,00 €	40.000,00 €
5.	12.2	280	5.270	36.890,00 €	- €	36.890,00 €	23.	20.8	68	1.149		40.000,00 €	40.000,00 €
6.	23.2	304	5.270	36.890,00 €	- €	36.890,00 €	24.	31.8	72	1.335	9.345,00 €	6.541,50 €	15.886,50 €
7.	5.3	196	3.601	25.207,00 €	- €	25.207,00 €	25.	10.9	93	1.707	11.949,00 €	5.974,50 €	17.923,50 €
8.	16.3	259	4.751	33.257,00 €	- €	33.257,00 €	26.	21.9	64	1.149		40.000,00 €	40.000,00 €
9.	26.3	195	3.601	25.207,00 €	- €	25.207,00 €	27.	1.10	58	964		40.000,00 €	40.000,00 €
10.	6.4	231	4.367	30.569,00 €	- €	30.569,00 €	28.	12.10	53	964		40.000,00 €	40.000,00 €
11.	16.4	233	4.367	30.569,00 €	- €	30.569,00 €	29.	22.10	25	413		40.000,00 €	40.000,00 €
12.	27.4	218	3.983	27.881,00 €	- €	27.881,00 €	30.	2.11	57	1.149		40.000,00 €	40.000,00 €
13.	7.5	188	3.410	23.870,00 €	- €	23.870,00 €	31.	11.11	41	780		40.000,00 €	40.000,00 €
14.	18.5	263	4.944	34.608,00 €	- €	34.608,00 €	32.	22.11	29	413		40.000,00 €	40.000,00 €
15.	28.5	210	3.983	27.881,00 €	- €	27.881,00 €	33.	2.12	35	596		40.000,00 €	40.000,00 €
16.	8.6	218	3.983	27.881,00 €	- €	27.881,00 €	34.	13.12	201	3.792	26.544,00 €	- €	26.544,00 €
17.	18.6	264	4.944	34.608,00 €	- €	34.608,00 €	35.	23.12	151	2.839	19.873,00 €	- €	19.873,00 €
18.	29.6	150	2.839	19.873,00 €	- €	19.873,00 €				105.423	675.577,00 €		1.099.787,20 €

*Low water surcharge

SAMPLE CALCULATION 2018

“RHENUS DORTMUND” + 2 ADDITIONAL BARGES

Voyage	date	Kaub	tonnage	Freight charges	total freight charges	Voyage	date	Kaub	tonnage	Freight charges	total freight charges
1.	1.1	333	5.270	36.890,00 €	36.890,00 €	19.	9.7	168	5.270	36.890,00 €	36.890,00 €
2.	12.1	471	5.270	36.890,00 €	36.890,00 €	20.	20.7	107	3.924	27.468,00 €	36.890,00 €
3.	22.1	523	5.270	36.890,00 €	36.890,00 €	21.	30.7	81	3.231	22.617,00 €	36.890,00 €
4.	2.2	437	5.270	36.890,00 €	36.890,00 €	22.	10.8	70	2.887	20.209,00 €	36.890,00 €
5.	12.2	280	5.270	36.890,00 €	36.890,00 €	23.	20.8	68	2.544	17.808,00 €	36.890,00 €
6.	23.2	304	5.270	36.890,00 €	36.890,00 €	24.	31.8	72	2.887	20.209,00 €	36.890,00 €
7.	5.3	196	5.270	36.890,00 €	36.890,00 €	25.	10.9	93	3.577	25.039,00 €	36.890,00 €
8.	16.3	259	5.270	36.890,00 €	36.890,00 €	26.	21.9	64	2.544	17.808,00 €	36.890,00 €
9.	26.3	195	5.270	36.890,00 €	36.890,00 €	27.	1.10	58	2.201	15.407,00 €	36.890,00 €
10.	6.4	231	5.270	36.890,00 €	36.890,00 €	28.	12.10	53	2.201	15.407,00 €	36.890,00 €
11.	16.4	233	5.270	36.890,00 €	36.890,00 €	29.	22.10	25	1.180	8.260,00 €	36.890,00 €
12.	27.4	218	5.270	36.890,00 €	36.890,00 €	30.	2.11	57	2.201	15.407,00 €	36.890,00 €
13.	7.5	188	5.270	36.890,00 €	36.890,00 €	31.	11.11	41	1.859	13.013,00 €	36.890,00 €
14.	18.5	263	5.270	36.890,00 €	36.890,00 €	32.	22.11	29	1.180	8.260,00 €	36.890,00 €
15.	28.5	210	5.270	36.890,00 €	36.890,00 €	33.	2.12	35	1.519	10.633,00 €	36.890,00 €
16.	8.6	218	5.270	36.890,00 €	36.890,00 €	34.	13.12	201	5.270	36.890,00 €	36.890,00 €
17.	18.6	264	5.270	36.890,00 €	36.890,00 €	35.	23.12	151	5.270	36.890,00 €	36.890,00 €
18.	29.6	150	5.270	36.890,00 €	36.890,00 €				144.605	1.012.235,00 €	1.291.150,00 €

IN COMPARISON

- “RHENUS DORTMUND” 35 VOYAGES, 7€/TONS

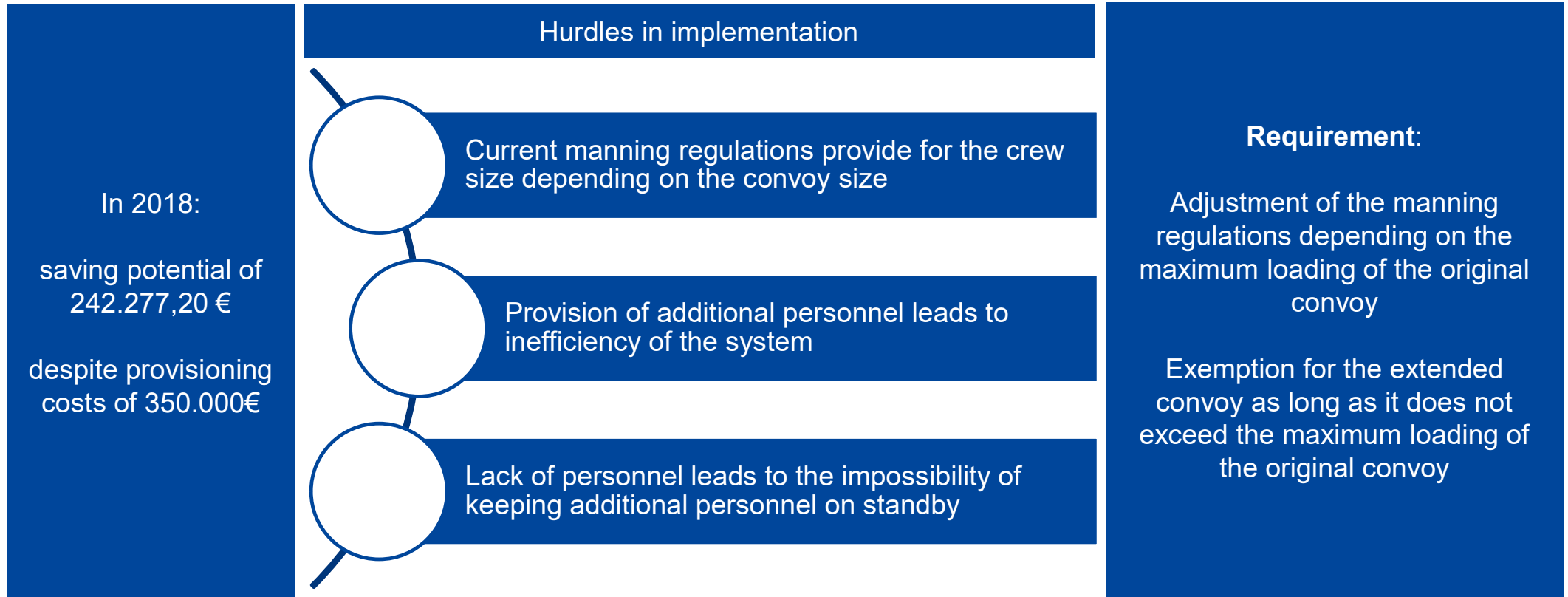
completely loaded	loading capacity	Freight charges
per trip	5.270 tons	36.890 €
per year	184.450 tons	1.291.150 €

“Rhenus Dortmund” LWS* based on Kaub 1,40m, free agreement at Kaub 0,7m	
total amount	105.423 tons
total rate	1.099.787,20 €
shortfall tonnage	39.182 tons
market rate	25 €
total rate	783.640,00 €
	1.883.427,20 €

“Rhenus Dortmund” + 2 additional barges	
total amount	144.605 tons
total rate	1.291.150,00 €
provisioning of barges	350.000€
	1.641.150,00 €

*Low water surcharge

SIGNIFICANT SAVINGS POTENTIAL



THOMAS MAAßEN

Managing Director
Rhenus Transport GmbH
& Co. KG