

Annex XIV

(From REPORT ON SCIENTIFIC RESEARCH WORK “Environmental Assessment (EA) within the framework of the project “Creation of the Danube – the Black Sea deep-water navigable passage in the Ukrainian part of the delta. Stage 1”. *Official translation provided by Ukraine 11.11.04*)

Table 8.1 – Complex evaluation of the influence of the deep-sea navigation channel during its construction

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
1. An excavation and temporary storage of a ground on the plot of the Danube channel from Izmailsky Chatal to Vilkovo in the	Damage of the bottom during the excavation	1.129km ²	Destruction of the benthos biocenoses during the construction period on the area of 1.4% of the bottom of the channel considered plot.	A slight temporary drop of the cleaning capability of the river ecosystem on the considered plot. Convertibility of the process is ensured by non-simultaneous influence along the plot and benthos organism move by tractional loads. The impact on the aquatic system is permissible.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Ground losses during the excavation (2 %)	4 3844m ³	Downstream diffusion of a fine-dyspersated suspension with adsorbed pollutants, increase of the water content of biogenic matters, ions of the metals, harmful organic substances, both in dissolved state and as a suspension (see tables 4.3.10 - 4.3.12), radioactive nuclides (in case of their increased content in the ground deposits).	<p>During the low-water flows, in the cross-section of complete mixing, which is situated lower than the plot of the simultaneous operation of two hydraulic dredges, the 95% of the water content of suspended matters will increase on 0.5mg/dm³. Thus the gross content of separate substances in water would briefly increase: nitrogen - on 0.12% from the background concentrations, phosphorus - on 16.2%, manganese - on 11.5 %, zinc - on 28.6 %, copper - on 2.1 %, cadmium - on 1.0 %, lead - on 2.7 %, chromes - on 1.6 %, organic substances (by biochemical oxygen demand - BOD₅) - on 5.7 %, petroleum - on 9 %, surface-active materials - on 2.2 %, pesticides – on less than 1 %. The growth of concentrations of these substances at chronic contamination during the construction period is estimated as 10-20 times less.</p> <p>The increase of the content of the suspended matters, water body trophicity</p>

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Land occupation for temporary dumps	96 hectares	An inwash of a ground layer of 2-3m on the sites between the channel banking dams and near dam channels of polder system by a suction-tube dredger.	The lands, assigned under the sites, are unused and man-caused infringed. Their considerable part was already used for dumps earlier. The ground from dumps will be used for repair and reconstruction of the defective plots of dams. In accordance with reduction of amounts of works on excavation these assigned lands will be reclaimed. The Influence on the land resources is allowable.
	Return of fluids from the dumps	$\Sigma Q_i < 1.0 \text{ m}^3/\text{s}$	The receipt by the channel of pollutants, having the same nature as ones, appeared during dredging. These pollutants come with storm and filtration waters, formed on the sites.	Suspended matters with adsorbed metals, organic substances, radioactive nuclides are detained in core pools. Thus the receipt of the dissolved harmful impurities averages over time. In view of slight flows of return fluids and their watering in near dam channels, the influences on the quality of the river water are allowable.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Noise of operating engines and mechanisms	The noise level on a coast is 55dBA	The calculations of the noise nuisance are presented in the source data for environment impact evaluation, given by "Rechtransproject".	According to the calculations the noise nuisance is permissible in reference to existing regulations.
	Pollutant emissions in the atmosphere made by operating equipment	16.2t	The calculations of the atmospheric gross blowouts of hazardous substances and their concentrations in the affected zone after dispersion are presented in the source data given by "Rechtransproject".	According to the calculations, taking into consideration the temporary character of the works, the influence on the air is allowable with reference to existing regulations.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
2. An excavation of a ground on the plot from Vilkovo to the sea edge of the delta with following ground transportation to the dump near Izmail Chatal - Vilkovo in quantity of 170 000m³	A damage of a bottom during the excavation	0.17km ²	Destruction of the benthos biocenoses during the construction period on the area of 2.5% of the bottom of the channel considered plot, situated outside of the reserve zone.	A negligible and temporary drop of the cleaning capability of the river ecosystem. The impact is permissible.
	Ground losses during the excavation (5%)	8 500m ³	The same pollutants would come in the channels Starostambul and Bystryy as on the plot of Reni-Vilkovo.	The increase of the content of the suspended matters, water body trophicity and deterioration of the oxygen content are estimated as insignificant. The toxic impact on aquatic organisms would be brief and will not change essentially the usual toxicological situation. Taking into account the compensation and the ban on operation during the certain periods, stipulated by the project, the influence would be allowable.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Noise of operating engines	The noise level on a coast is 55dBA	The calculations of the noise nuisance are presented in the source data for environment impact evaluation, given by "Rechtransproject".	According to the calculations the noise nuisance is permissible in reference to existing regulations. The deterrent effect on the fauna is shown out of the reserve zone and has a local character.
	Pollutant emissions in the atmosphere made by operating engines	1.8t	The calculations of the atmospheric gross blowouts of hazardous substances and their concentrations in the affected zone after dispersion are presented in the source data given by "Rechtransproject".	The emission takes part outside the reserve zone. According to the calculations, taking into consideration the temporary character of the works, the influence on air is allowable with reference to existing regulations. It is fauna disturbing and has a local character.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
3. An excavation of 2 155.6 thousand m³ of ground and construction of the dam on the sand bar plot, with the length of 1040m. The transportation of 620 thousand m³ of ground to the coastal dumps on the plot of Izmail Chatal - Vilkovo and 1 535.6 thousand m³ to the sea dump.	A damage of a bottom during the excavation and dam construction.	0.58km ²	Destruction of the benthos biocenoses on bottom plots at the area of the sand bar of the Bystryy branch.	The effaceable biocenoses are valuable ones. The drop of the cleaning activity would have little impact on the quality of water due to sufficient water change. The influence on biota is significant. Taking into consideration the compensation of the damage to the fish fodder supplies, provided in the project, it is permissible.
	Ground losses during the excavation (5%)	116 550m ³	The entrance of the pollutants to the coastal waters.	The water quality worsening because of the pollutants coming in from the ground. The effect is significant, but has a local character. Taking into account the compensation of the damage to the water fauna which is foreseen in the project.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Noise of operating engines	The noise level on a coast is 32dBA	The calculations of the noise nuisance are presented in the source data for environment impact evaluation, given by "Rechtransproject".	According to the calculations the noise nuisance is permissible in reference to existing regulations. In view of the sufficient distance from the shore the impact on a fauna will be negligible. Out of the zone of 50m from the riverside the exceeding of the noise level permissible for reserves is not foreseen.
	Pollutant emissions in the atmosphere made by operating engines	30.2t	The calculations of the atmospheric gross blowouts of hazardous substances and their concentrations in the affected zone after dispersion are presented in the source data given by "Rechtransproject".	According to the calculations the influence on air is allowable with reference to existing regulations. In view of the sufficient distance from the shores the impact on the fauna is insignificant.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Contact of the ground with water mass and with bottom in the dumping site.	1 535.6 thousand m ³	The composition of the suspended matters, dissolved contaminants and organic matters is the same as the one which would enter the water with the lost ground during the dredging process.	The influence is strong. Taking into account the stipulated in the project compensation of the damage to the fish fauna, the dumping is allowable on the specially assigned water area, allocated at the distance of more than 5 km from the shore.

Table 8.2 – Complex evaluation of the influence of the deep-sea navigation canal during its operation

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
1. Repair dredging operations on the riverbed plots of the canal. An excavation of 940 thousand m³/year of ground (after the data of the feasibility study).	A damage of a bottom during the excavation	1.2km ²	Destruction of the benthos biocenoses during a year on the area of 1.4% of the bottom of the riverbed.	<p>A slight temporary drop of the cleaning capability of the river ecosystem on the considered plot. Convertibility of the process is ensured by non-simultaneous influence along the plot and benthos organism move by tractional loads.</p> <p>Taking into consideration the provided compensation of the damage to the fish fodder supplies, it is permissible.</p>

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Ground losses during the excavation (2 %)	1 8400m ³ /year	Downstream diffusion of a fine-dyspersated suspension (5% from the value of losses) with adsorbed pollutants, increase of the water content of biogenic matters, ions of the metals, harmful organic substances, both in dissolved state and as a suspension.	<p>The increase of the content of the suspended matters, water body trophicity and deterioration of the oxygen content on the considered part of the riverbed and downstream are estimated as insignificant. The toxic impact on aquatic organisms would appear occasionally, on the local plots and will not change essentially the usual toxicological situation in the Danube delta.</p> <p>Taking into account the provided compensation of the damage to water fauna, the influence is allowable.</p>
	Land occupation for temporary dumps	< 96 hectares, are considered in the table 8.1	The use of the lands which were allocated for dumps previously is assumed.	<p>The lands, assigned under the dumps during the period of construction, are used. The liberated sites are reclaimed.</p> <p>The Influence on the land resources is allowable.</p>

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Return of fluids from the dumps	$\Sigma Q_i < 1.0 \text{ m}^3/\text{s}$	Suspended matters with adsorbed metals, organic substances and radioactive nuclides are detained in core pools.	Suspended matters with adsorbed metals, organic substances and radioactive nuclides are detained in core pools. Thus the receipt of the dissolved harmful impurities averages over time. In view of slight flows of return fluids and their watering in near dam channels, the influence on the quality of the river water is insignificant.
	Noise of operating engines	The noise level on a coast is 55 dBA	The calculations of the noise nuisance are presented in the source data for environment impact evaluation, given by "Rechtransproject".	According to the calculations the noise nuisance is permissible in reference to existing regulations.
	Pollutant emissions in the atmosphere by engines	18.8 t/year	The calculations of the atmospheric gross blowouts of hazardous substances and their concentrations in the affected zone due to dispersion are presented in the source data given by "Rechtransproject".	According to the calculations, taking into consideration the temporary character of the works, the influence on air is allowable with reference to existing regulations.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
2. Repair dredging operations on the sand bar plot. An excavation of 232 thousand m³/year of ground (after the data of the feasibility study).	A damage of a bottom during the excavation	0.3 km ²	Destruction of the benthos organisms on the plots of the bottom on the area of the sand bar of the Bystry branch .	Annihilable secondary bottom biocenoses are not valuable. In view of sufficient water exchange the drop of the cleaning activity will have a little effect on the quality of the water. The impact is permissible.
	Ground losses during the excavation (5%)	11 600m ³	The entrance of pollutants in the masses of the coastal waters.	The deterioration of the water quality due to inflow of the contaminants from the ground. The influence is significant, but local one. Taking into account the provided compensation of the damage to water fauna it is allowable.
	Noise of operating engines	The noise level on a coast is 32 dBA	The calculations of the noise nuisance are presented in the source data for environment impact evaluation, given by "Rechtransproject".	According to the calculations the noise nuisance is permissible in reference to existing regulations. In view of the sufficient distance from the shore the impact on a fauna will be negligible.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Pollutant emissions in the atmosphere made by operating engines	5.3 t/year	The calculations of the atmospheric gross blowouts of hazardous substances and their concentrations in the affected zone due to dispersion are presented in the source data, given by "Rechtransproject".	According to the calculations, the influence on air is allowable with reference to existing regulations. In view of the sufficient distance from the shore the impact on a fauna will be negligible.
	Contact of the ground with water mass in the dumping site.	232 thousand m ³	The composition of the suspended matters, dissolved contaminants and organic matters is the same as the one which would enter the water with the lost ground during the dredging process.	The influence is strong. The dumping is admissible only at the previously allocated and used plot of the sea water area, taking into account the provided compensation of the damage to a fish fauna.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
3. The complex of constructions of navigation canal and ships traffic.	The presence of the opening and dams in the region of the sand bar.	3 km	The change of the natural character of the processes of the advancement of the delta marine edge in the area of the sand bar and of the development of the Ptichya spit .	Possibility of the loss of places of safe nesting of guarded birds' species, breaking of alongshore fishes' finishing migration routes and their hatchery areas. The influence on the fauna is the subject of monitoring. The realization of regulating protective hydraulic engineering measures and money compensation of unavoidable damage is stipulated on necessity.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Changed parameters of the channels and sand bar area	A complex of factors	Enlarged salted waters intake in the riverbed of the Bystryy branch .	The degradation possibility of the existing benthos organisms' complex and formation of a new one. Disappear of infrequent and endemic fishes' species. Influence on a fish fauna is the subject of monitoring. Money compensation of unavoidable damage is stipulated on necessity.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
			<p>The probability of redistribution of the water flows between the branches of the Kiliya delta. Intensification of positive and negative setup phenomena in the Bystryy branch and its riverside.</p>	<p>Some intensification of the water exchange and water level fluctuations at the riverside of the Bystryy branch will not produce an essential influence on coastal biocenoses. The redistribution of the river flow in the delta due to first-stage works is predicted as slight; on the second stage of construction the engineering regulation of the water flows on the entrance in the Bystryy branch is provided for prevention of the negative changes of water regime in the delta.</p> <p>The influence is the subject of monitoring. Taking into consideration of the provided regulating hydraulic engineering measures, it is allowable.</p>

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	A landwash during the passage of ships	The waves' height is up to 0.7 m		<p>According to the forecasts, at ships speed limitations, assumed in the project, the parameters of man-caused hydrodynamic loads on the banking near the riverbed of the Bystryy branch and on the Ptichya spit do not fall outside the limits of the natural values amplitude and will not produce significant breaches in these biocenoses.</p> <p>The influence is the subject of monitoring. Taking into consideration the provided restrictive and protective hydraulic engineering measures, including the compensations and bank consolidation, it is allowable.</p>

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	An intake of pollutants in water	On the length of the navigation canal, 159.5 km	A water drain of engines' cooling systems, the exhausts in water of boats engines. Drains which are not authorized or emergency ones.	Contamination is insignificant in conditions of normal operation. At failures ecological effects can be very serious, irrespective of the allocation of the initial pollution focus. The probability of failures in the accepted variant is the least in view of a smaller canal length and the best navigating conditions.

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Noise of operating engines and other factors, disturbing the fauna of the Danube Biosphere Reserve	The noise level on a coast is 54.75 dBA	Influence of passing by ships on animals' senses in the riverside of the Bystry branch. The calculations of the noise nuisance are presented in the report of the Open Company "Ecoton".	<p>Difficulties for migration of land animals through the water area of the Bystry branch, decrease of their number in the riverside of the Bystry branch are possible.</p> <p>The level of a noise nuisance from engines of cargo and passenger vessels and of motorboats is in permissible limits after the regulations for reserves, which are situated outside the riverside.</p> <p>The influence is the subject of monitoring. Taking into consideration the provided restrictions of the ships' speeds and sound signal injections, it is permissible.</p>

Kind of works	The factor of influence	The quantitative characteristics of the factor	The characteristics of processes of influence	Evaluation of the consequences of the influence, taking into account the measures on their limitation
	Pollutant emissions in atmosphere made by operating engines		The calculations of the blowouts' dispersion are presented in the report of the Open Company "Ecoton".	The influence is allowable with reference to existing regulations.
	Bringing of new representatives of flora and fauna.	It is probable	During the transit of ships through the Bystryy branch and upstream with possible following spread in the entire delta.	The undesirable change of water biocenoses is possible. The displacement of guarded and valuable species, the deterioration parasitologic state. The influence is the subject of monitoring and control from the specialized agencies.