



SUPPLEMENTARY MATERIAL TO
**Effects of persistent organic pollutants and mercury in protected area
„Obrenovački zabran”**

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STUDY AREA

The protected area „Obrenovački zabran” (OZ) is located between the Sava and Kolubara Rivers in northwest Serbia (Fig. S-1). More precisely, with its extreme north-eastern border, OZ reaches the right bank of the Sava River, and in the south and east, it almost abuts the left bank of the Kolubara River. The OZ is located 1.5 km east of the city of Obrenovac and 12 km southwest of the suburbs of the city of Belgrade (the capital of Serbia). The total protected area is 47,77.18 ha. The whole location is specific by its hydrological, morphological, and geological characteristics. The protected area belongs to the plain terrain, i.e., the alluvial plains of the Sava and Kolubara Rivers above which is a river terrace Lower Pliocene age marly clay are dark gray to gray, and underlying river terrace sediments. Due to the meandering of the Sava and Kolubara Rivers during the Holocene, the formed terrace represents a common terrace for both Rivers. Five sediment samples (S1 – S5) and 7 soil samples (M1 – M7) were taken from the protected area OZ. Surface sediments and soil were taken at a depth of 0 – 10 cm. Sediment samples were taken from the Sava River and soil samples were taken from the area that is flooded at high Kolubara River groundwater levels. The collected samples were immediately transferred into dark glass bottles and transported to the laboratory.

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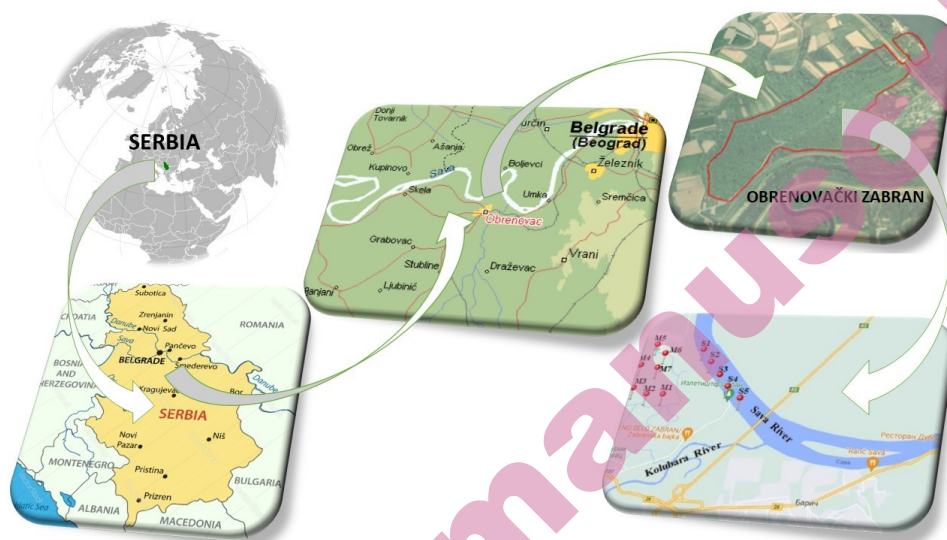


Fig. S-1. Study area of „Obrenovački zabran” with sampling locations (S1 – S5 are sediment samples, M1 – M7 soil samples).

TABLE S-I. Parameters used for incremental lifetime cancer risk (ILCR) calculation

Parameter	Description	Unit	Adults	Children	Reference
CSF_{ing}	Ingestion carcinogenic slope factor	$kg\ d\ mg^{-1}$	7.3	7.3	56
IR_{ing}	Ingestion rate	$mg\ d^{-1}$	100	200	57
EF	Exposure frequency	$d\ y^{-1}$	350	350	57
ED	Exposure duration	y	24	6	58
BW	Body weight	kg	70	15	59
AT	Average life span	d	25550	25550	58
CSF_{derm}	Dermal carcinogenic slope factor	$kg\ d\ mg^{-1}$	25	25	56
SA	Dermal surface exposure	$cm^2\ d^{-1}$	5700	2800	57
AF	Dermal adherence factor	$mg\ cm^{-2}$	0.07	0.2	57
ABS	Dermal adsorption fraction	Unitless	0.13	0.13	57
CSF_{inh}	Inhalation carcinogenic slope factor	$kg\ d\ mg^{-1}$	3.85	3.85	56
IR_{inh}	Inhalation rate	$m^3\ d^{-1}$	20	10	56
PEF	Particle emission factor	$m^3\ kg^{-1}$	1.36×10^9	1.36×10^9	57

TABLE S-II. Incremental lifetime cancer risk (ILCR) and total cancer risk (TCR_{PAH}) from PAHs

Samples	ADULTS				CHILDREN			
	ILCR _{ring}	ILCR _{der}	ILCR _{inh}	TCR _{PAH}	ILCR _{ring}	ILCR _{der}	ILCR _{inh}	TCR _{PAH}
M1	2.2E-04	3.9E-04	1.7E-08	6.1E-04	3.1E-04	3.8E-04	5.9E-09	6.9E-04
M2	4.7E-04	8.3E-04	3.6E-08	1.3E-03	6.6E-04	8.2E-04	1.3E-08	1.5E-03
M3	5.9E-04	1.0E-03	4.6E-08	1.6E-03	8.2E-04	1.0E-03	1.6E-08	1.8E-03
M4	3.5E-04	6.3E-04	2.8E-08	9.9E-04	5.0E-04	6.2E-04	9.6E-09	1.1E-03
M5	5.1E-04	9.0E-04	3.9E-08	1.4E-03	7.1E-04	8.8E-04	1.4E-08	1.6E-03
M6	2.2E-04	3.9E-04	1.7E-08	6.1E-04	3.0E-04	3.8E-04	5.9E-09	6.9E-04
M7	1.0E-03	1.9E-03	8.1E-08	2.9E-03	1.5E-03	1.8E-03	2.8E-08	3.3E-03
S1	3.1E-04	5.5E-04	2.4E-08	8.6E-04	4.3E-04	5.4E-04	8.4E-09	9.7E-04
S2	4.1E-04	7.2E-04	3.2E-08	1.1E-03	5.7E-04	7.1E-04	1.1E-08	1.3E-03
S3	3.3E-04	5.8E-04	2.5E-08	9.0E-04	4.5E-04	5.7E-04	8.8E-09	1.0E-03
S4	5.7E-04	1.0E-03	4.4E-08	1.6E-03	8.0E-04	1.0E-03	1.5E-08	1.8E-03
S5	6.4E-04	1.1E-03	5.0E-08	1.8E-03	9.0E-04	1.1E-03	1.7E-08	2.0E-03
Min	2.2E-04	3.9E-04	1.7E-08	6.1E-04	3.0E-04	3.8E-04	5.9E-09	6.9E-04
MAX	1.0E-03	1.9E-03	8.1E-08	2.9E-03	1.5E-03	1.8E-03	2.8E-08	3.3E-03
Average	4.9E-04	8.6E-04	3.8E-08	1.3E-03	6.8E-04	8.5E-04	1.3E-08	1.5E-03
SD	2.8E-04	5.0E-04	2.2E-08	7.9E-04	4.0E-04	4.9E-04	7.7E-09	8.9E-04
Median	4.7E-04	8.3E-04	3.6E-08	1.3E-03	6.6E-04	8.2E-04	1.3E-08	1.5E-03
Min	3.1E-04	5.5E-04	2.4E-08	8.6E-04	4.3E-04	5.4E-04	8.4E-09	9.7E-04
MAX	6.4E-04	1.1E-03	5.0E-08	1.8E-03	9.0E-04	1.1E-03	1.7E-08	2.0E-03
Average	4.5E-04	8.0E-04	3.5E-08	1.3E-03	6.3E-04	7.9E-04	1.2E-08	1.4E-03
SD	1.5E-04	2.7E-04	1.2E-08	4.2E-04	2.1E-04	2.6E-04	4.0E-09	4.7E-04
Median	4.1E-04	7.2E-04	3.2E-08	1.1E-03	5.7E-04	7.1E-04	1.1E-08	1.3E-03

TABLE S-III. Non-cancer and cancer health risks from Hg in soil (samples M1 – M7)

		NON-CANCER RISK							
		HQ _{ing}		HQ _{inh}		HQ _{der}		HI	
		Child	Adult	Child	Adult	Child	Adult	Child	Adult
Hg	Mean	9.4E-02	1.0E-02	9.2E-06	2.7E-05	5.8E-02	7.7E-03	1.5E-01	1.8E-02
	Min	1.2E-02	1.3E-03	1.2E-06	2.3E-05	7.6E-03	1.0E-03	2.0E-02	2.4E-03
	Max	1.4E-01	1.5E-02	1.3E-05	3.3E-05	8.4E-02	1.1E-02	2.2E-01	2.6E-02

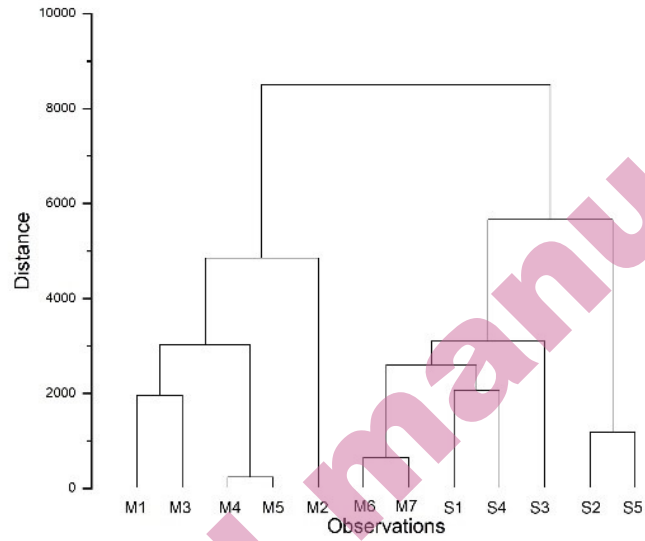


Fig. S-2. Cluster analysis of observed sediment samples from the Sava River (S1 – S5) and soil samples (M1 – M7) that are flooded at high Kolubara River groundwater levels.