



TRANSBOUNDARY ACCIDENT PREVENTION AND CONTROL IN THE DANUBE RIVER BASIN

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International Commission
for the Protection
of the Danube River

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zum Schutz der Donau

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1. INTRODUCTION

Hazardous substances (HS) pollution of surface waters is one of the significant water management issues of basin-wide importance in the Danube River Basin (DRB)¹. HS pollution refers to the contamination with priority substances, dangerous substances and other specific pollutants with toxic or damaging (carcinogenic, teratogenic, mutagenic or physically harming) effects on aquatic organisms and humans. HS can pose serious threats to the aquatic environment on both, short and long term. Depending on their concentration and the actual environmental conditions, they can cause acute (immediate) or chronic (latent) toxicity or severe damages. Some of the HS are persistent, slowly degradable and can accumulate in the food chain once present in the ecosystems. Although HS pollution is one of the major concerns regarding chemical and ecological status of waters in the DRB, our knowledge on the volume and sources of pollutant emissions is insufficient and inaccurate, making the determination and implementation of control measures rather difficult.

Accidental pollution events represent a specific and generally dangerous form of water contamination by hazardous substances. Industrial facilities, mining areas and contaminated sites that store, process or produce such substances in substantial amounts pose a hazard (potential risk) to water by having a certain potential to cause serious pollution, even though they might not have any such release in their regular operation. However, in cases of emergency situations (natural hazard events like floods, earthquakes or landslides and operation failures) and without appropriate safety measures in place they can represent a real water pollution risk. Depending on the type and mixture of the HS, their released amount, the temporal variability of the pollution and the local circumstances, accidental spills can adversely impact upon the receiving environmental medium and the ecosystems, population, economic activities, goods and properties of the affected surrounding areas – and even those of regions further downstream if contaminants reach river systems.



The industrial sector in the DRB shows a wide range of activities. The character of the industrial palette has changed over the course of the last three decades, particularly in the Eastern and Southern countries where the industrial sector has been privatised, restructured, adjusted to the market needs, or closed down due to economic constraints. According to the current industrial inventory of the European Pollutant Release and Transfer Register² (E-PRTR) of the European Environment Agency, which disseminates information on the major industrial facilities in Europe, more than 2,000 large³ facilities⁴ operate in the DRB⁵. Waste and wastewater management and metal processing have the highest importance among the industrial activities by representing 29% and 22% of the installations, respectively. Energy sector, mineral and chemical industries have a similar proportion of about 10% for each.

The surface water bodies of the DRB were severely damaged by several major accident events in the last two decades. The cyanide spill at Baia Mare in Romania (2000) and the red mud spill at Ajka in Hungary (2010) dramatically demonstrated how catastrophic the consequences of inappropriately operating industrial facilities can be, and what effect the lack of adequate safety measures might have on the

aquatic environment, population, or socio-economic goods. The Ajka case also showed the importance of prompt and effective crisis management. Thanks to the speedy emergency measures and actions put into operation, the sludge spill had no substantial impact on the ecosystems of the Danube River.

Although preventing and controlling accidental pollution has a long history in the DRB, there are a substantial number of installations associated with high risk in the basin, where appropriate safety conditions should be ensured. In addition to preventive measures, an effectively operated warning system and close cooperation between riparian countries are also needed for quick responses to emergency situations. This report summarises the mechanisms, activities and tools the ICPDR has developed and implemented in order to prevent, control and mitigate adverse consequences of any transboundary accidental pollution.

¹ ICPDR (2019): *Interim Overview: Significant Water Management Issues in the Danube River Basin District.*

² <https://industry.eea.europa.eu/>

³ Above certain capacity, pollutant release and waste transfer thresholds defined in E-PRTR.

⁴ Without installations for intensive livestock production

⁵ Data are not reported for Bosnia and Herzegovina, Moldova, Montenegro and Ukraine.





2.

SUMMARY OF THE MAJOR ACCIDENT EVENTS FROM THE PAST

Besides a few, mainly local accidental pollution events, two major accidents happened in the DRB in the last two decades, both of which had serious negative impacts on the aquatic ecosystems. The main lesson learnt from these events is that despite several quick and effective technical solutions deployed during the emergency and remediation phases of the spills, the costs of any remediation activities are always likely to be far higher than introducing appropriate safety and prevention measures in advance of such events. Implementing appropriate safety measures at the accident risk hot spots is a strong prerequisite for an effective risk mitigation and contingency management plan.

Cyanide spill at Baia Mare & heavy metal spill at Baia Borsa

The Baia Mare accident in 2000 has been called the worst environmental disaster in the DRB, severely affecting Romania, Hungary and Serbia. Some 100,000–300,000 m³ of cyanide-contaminated mining wastewater was spilled from a gold mining company in Baia Mare, in the northwest of Romania into an 800 km stretch of the Sarsar, Lapus, Szamos and Tisza rivers. Many tons of fish and all planktonic organisms were killed, and drinking water supplies were contaminated as the cyanide plume travelled downstream. Soon after the plume passed, however, plankton and aquatic micro-organisms recovered relatively quickly – within a few weeks – thanks to unaffected water flowing from upstream and from the tributaries.

Just shortly after the cyanide spill, another pollution plume hit the Tisza River. The dam of a mining tailings pond in Baia Borsa collapsed due to a quick and intensive snowmelt and ca. 20,000 m³ of sludge containing various heavy metals was released to the valley downstream of the pond dam. Subsequent rainfall and runoff events transported the sludge towards streams and finally to the Tisza River. High metal concentrations were detected in the Hungarian Tisza stretches. Since the heavy metals were mainly attached to suspended particles, a significant amount of metals remained in the river sediment and on the floodplains via settling.

The Ajka red mud spill

The critical need for quick and coordinated crisis management was demonstrated in 2010 when an industrial liquid waste reservoir collapsed at the Ajka Alumina Plant in Hungary sending a thick 1–2 m wave of over one million m³ of alkaline red sludge across 40 km² of land. The sludge spill reached several villages nearby and contaminated the Tarna and Marcal Rivers. The spill killed 10 people and injured 150 others, swept cars off roads and damaged bridges and houses, along with 1000 ha of farmland, and killed all living organisms in the receiving streams. Thanks to the effective emergency management put into operation by the Hungarian authorities, the sludge spill had no substantial impact on the ecosystem of the Danube River in Hungary and downstream.





3. LEGAL BACKGROUND

The International Commission for the Protection of the Danube River (ICPDR) has been dealing with accidental pollution since its establishment by implementing the Danube River Protection Convention⁶ (DRPC). The DRPC, the main legal instrument for transboundary co-operation on water management in the DRB mandates the ICPDR Contracting Parties to make all efforts to control the hazards originating from accidents involving substances hazardous to water. Inter alia, the DRPC requires the minimisation of the risks and consequences of accidental pollution by taking appropriate preventive, control and response measures and to provide coordinated communication, warning and alarm systems and emergency plans in a basin-wide context, supplementing the systems operated at the bilateral or multinational levels.

Besides the commitments of the DRPC on controlling accidental pollution events, the implementation of water-management-related EU legislation in the DRB also requires addressing accident prevention issues. The ICPDR has been mandated to coordinate the implementation of the EU Water Framework Directive⁷ (WFD) and the EU Floods Directive⁸ (FD) in all transboundary aspects. When the WFD and FD were adopted in 2000 and in 2007 respectively, all cooperating countries under the DRPC decided to make every effort to implement the WFD throughout the whole basin. In line with the obligations of these Directives, the ICPDR recently elaborated and published the Danube River Basin District Management Plan Update 2021⁹ and the Danube Flood Risk Management Plan Update 2021¹⁰.

The purpose of the WFD is to protect and enhance the status of inland surface waters, transitional waters, coastal waters and groundwater, and to ensure both the sustainable use of water resources and that all waters meet 'good status' by 2027 at the latest. With respect to accidental pollution, the WFD obliges countries to prevent or reduce the impact of accident events by which water can be polluted. Measures with the aim of doing so have to be included in the programme of measures of the river basin management plans, to be elaborated upon every 6 years. The aim of the FD is to reduce and manage the risks floods pose to human health, the environment, cultural heritage and economic activities. Concerning accidental pollution, flood risk maps shall indicate installations, which might cause accidental pollution in case of flooding. The flood management plan shall list flood-related measures to be taken regarding the control of major accidents involving dangerous substances.

On the European level, EU Member States (MS) are obliged to implement the Seveso Directive¹¹ to prevent major accidents involving dangerous substances and to limit the consequences of such accidents. Operators of dangerous facilities storing or processing dangerous substances in quantities above certain thresholds (given for lower and upper tier) have to develop a major accident prevention policy, to implement this policy by a safety management system, to provide safety reports and information on accidents and to elaborate emergency intervention plans for the internal areas of the establishments. Moreover, competent authorities of EU MS are

obliged to develop external emergency plans for the surrounding areas of the dangerous plants, to provide the public with necessary information regarding the risks posed by the respective plants, to ensure that appropriate remediation measures are taken in case of accidents and to conduct periodic inspections to check whether technical requirements are fulfilled.

Regarding mining activities, EU MS have to implement the Extractive Waste Directive¹², which aims to prevent or reduce any adverse effects on the environment and any resultant risks to human health as a result of the management of waste from the extractive industries including mineral processing. Operators shall draw up a waste management plan for the minimisation, treatment, recovery and disposal of extractive waste and shall have a permit from the competent authority. Similar obligations to those of the Seveso Directive (safety reports, accident prevention policy, on site emergency plans, information for the public) are in place for Category A mining waste facilities.

To ensure enhanced industrial technologies, EU MS have to comply with the Industrial Emissions Directive¹³ (IED). The IED prescribes that authorities need to ensure that pollution prevention and control measures at the major industrial units are up-to-date with the latest Best Available Techniques (BAT) developments. The industrial plants covered by the IED must have an environmental permit with emission limit values for polluting substances to ensure that certain environmental conditions and technical standards are met.

At large regional scale, Parties to the Convention on the Transboundary Effects of Industrial Accidents¹⁴ (TEIA Convention) of United Nations Economic Commission for Europe (UNECE) have to fulfil obli-

gations related to industrial hazards similar to those of the Seveso Directive. The TEIA Convention aims at preventing accidents that can have transboundary effects and at helping countries to prepare for and respond to accidents if they occur. It also promotes active international cooperation regarding accident risk mitigation. To further support the countries, under the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) and the TEIA Convention a specific Joint Expert Group (JEG) was established in particular to focus on transboundary water pollution issues, which are related to industrial accidents. The JEG supports the elaboration of guidelines and checklists and organises seminars and trainings to help countries to develop, improve and harmonise their national procedures and requirements related to safety measures and contingency planning.

⁶ *Convention on Cooperation for the Protection and Sustainable Use of the Danube River, 1994.*

⁷ *Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.*

⁸ *Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks.*

⁹ *ICPDR (2021): Danube River Basin District Management Plan Update 2021.*

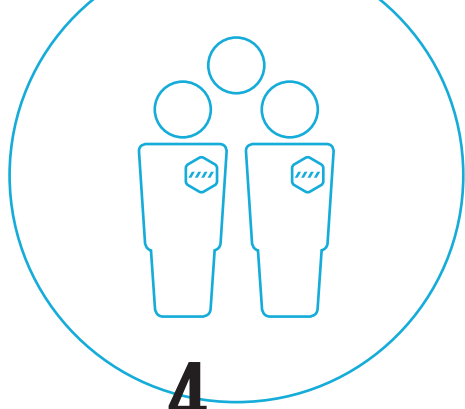
¹⁰ *ICPDR (2021): Danube Flood Risk Management Plan Update 2021.*

¹¹ *Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC.*

¹² *Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC.*

¹³ *Directive 2010/75/EU of the European Parliament and the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control).*

¹⁴ *Convention of the United Nations Economic Commission for Europe on the Transboundary Effects of Industrial Accidents, 2008.*



4.

ACCIDENT PREVENTION AND CONTROL EXPERT GROUP

To respond to these challenges, the ICPDR established the Accident Prevention and Control Expert Group (APC EG). The APC EG provides the Danube countries with a platform for information exchange, know-how transfer and thematic discussions related to accident prevention, early warning and contingency management. Moreover, the APC EG supports the development and implementation of technical tools, projects and joint activities to prevent and control accidental pollution. These activities also contribute to increasing awareness of accidental pollution amongst the public, and help to orient stakeholders and financial donors to priority industrial sectors where projects should be targeted and ensure transparency to the public.

The APC EG activities are focused on two main working fields: emergency warning and accident prevention. In the area of emergency warning, the Accident Emergency Warning System (AEWS) has been developed and is continuously operated and maintained by the ICPDR. The AEWS provides the countries with a 24/7 communication system aiming at timely responding to any transboundary emergency situation in surface waters and at ensuring time enough for putting in place quick emergency control measures. The accident prevention field is related to identification and assessment of accident hazard hot-spots and to recommendations and promotion of sufficient safety measures.





5.

ACCIDENT PREVENTION

Joint activities on accident prevention coordinated by the APC EG are inevitable since basin-wide consensus on preventive actions and measures is a prerequisite for establishing and implementing a sound and coherent accident prevention policy in the DRB. Standards for minimal technical requirements shall be respected by the countries including safety measures to be implemented.

One of the key activities within the field of accident prevention is the identification of industrial facilities, mining and abandoned sites, which pose accident hazard to water bodies. The APC EG regularly updates the accident hazard hot-spots inventory of the DRB and reassesses the accident risk potential of these hot-spots to identify the most dangerous sites and to prioritize industrial sectors according to accident hazard. The assessment is based on adopted risk assessment methods, which provide simple procedures for estimating the accidental hazard of industrial facilities, mining and contaminated sites. Recently, the inventory on operating industrial and energy production facilities that process, store, produce or release hazardous substances was updated and their potential risk of causing accidental pollution assessed. Moreover, the first inventory on tailings management facilities (TMF) has been developed for the DRB including hazard and risk assessments. Similar work is ongoing for contaminated sites that include old (not operating) industrial facilities, abandoned sites and landfills located in flood-prone areas.

More than 470 facilities with significant potential danger have been reported by the Danube countries. These installations store almost 12 million tons of hazardous substances. The energy sector (including oil industry), storage facilities for chemicals and oil products, mineral processing (mining sites) and the chemical industry are the most relevant sectors associated with large amounts of stored hazardous



substances. More than 90 installations have been reported to have a very high hazard, storing the vast majority (95%) of the total amount of hazardous substances processed in the DRB. Map 1 shows those identified industrial hotspots with the highest potential risk along with the water bodies, nature conservation areas and major settlements to be protected (see also Chapter 8). Oil and gas industry sites (refineries, tanks, storages, pipelines), energy production facilities (power plants), storage sites, mining sites and several chemical factories can be found among the facilities associated with the highest potential danger. Oil industry plants dominate the top 10 of

the most dangerous sites, and they store in total more than 7 million tons of hazardous substances.

In total, 335 TMF were identified in the DRB (see Map 2), in the territory of 9 Danube countries. The total volume of tailings materials in the 335 TMF (including 96 active TMF) is almost 1600 million m³. Most of the identified TMF (ca 70%) are inactive, many of them were already rehabilitated or are currently under rehabilitation. In total, 115 TMF have medium hazard, whereas high and very high hazard was determined for 82 TMF.



Nevertheless, the assessments can only give an indication on accident hazard or preliminary accident risk. The real risk of these industrial sites depends on the safety measures and procedures that have been applied in each installation, the potential receptors (e.g. population, water bodies) close to the TMF that could be exposed by an accident and the local conditions in the vicinity of the sites. In order to estimate the real safety level of the facilities in a consistent way and to improve it if necessary, specific sectorial checklists developed by the TEIA Convention have been adopted by the ICPDR (e.g. for tailings management facilities¹⁵ and oil terminals¹⁶). Danube countries are encouraged to integrate these checklists into their national approaches. It is recommended that national authorities use them in order to investigate in detail which particular safety measures are needed at the industrial facilities associated with high hazard.

Danube countries ensure through legislative instruments that all necessary safety and prevention measures and actions at the industrial facilities are properly designed and implemented to minimize accidental pollution risk. Competent authorities have to establish a thorough control mechanism with regular inspections, whilst operating companies need to employ a well-trained workforce with the sufficient management and technical capacity at the installations.

Besides the hot-spot inventories, the APC EG also focuses on activities related to practical measures to be implemented for risk mitigation. This includes organising thematic discussions, workshops

and training, developing and promoting sectorial guidelines, checklists and catalogues of measures and facilitating project implementation on safety measures for industrial sectors of high priority in the DRB.

Recently, the ICPDR implemented the Danube TMF Project¹⁷ (funded by the Advisory Assistance Programme of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, facilitated by the German Environment Agency). The project aimed at contributing to narrow the knowledge gaps and to raise awareness on TMF and their hazards in the DRB, ensuring to respect a common set of minimum standards and safety requirements in the DRB and strengthening the technical and management capacity at the concerned facilities and responsible authorities. Building on the strengths of the existing TMF-methodology¹⁸ developed by the German Environment Agency but also improving and adapting it based on up-to-date technical knowledge, Danube countries were provided with a set of practical tools to improve safety conditions of TMF and to strengthen the capacity of operators and authority inspectors. These tools were developed and adapted to the DRB conditions to consistently assess the hazard and risk of TMF located in the DRB (Tailings Hazard Index and Tailings Risk Index methods) and to evaluate their safety and recommend measures to improve safety conditions (checklist methodology). Moreover, within the project a demonstration regional training event was organised at Baia Mare in Romania to deepen the knowledge of invited TMF operators, environmental inspectors and competent authority experts on TMF management and to fine-

tune the methodology based on field experiences. Competent authorities, TMF operators, concerned stakeholders and the public in the DRB are encouraged to apply these tools, which are intended to contribute towards limiting the number of accidents at TMF and minimising the severity of their consequences for human health and the environment.

Building on the outcomes of the Danube TMF Project, the ICPDR published the recommendation paper “Improving the Safety of TMF in the DRB”¹⁹ to further raise awareness of the issue and provide recommendations at both the technical and policy-making level on how to ensure adequate safety conditions at the TMF in the DRB. The paper emphasizes the need of adequate preventive measures to minimize the risk of TMF failures with potential casualties and ecolog-

ical damages and to avoid substantial post-accident remediation costs.

¹⁵ UNECE (2014): *Safety guidelines and good practices for Tailings Management Facilities*.

¹⁶ UNECE (2015): *Safety guidelines and good industry practices for Oil Terminals*.

¹⁷ *Capacity development to improve safety conditions of tailings management facilities (TMF) in the Danube River Basin – Phase I: North-Eastern Danube countries; funded by the German Federal Environment Ministry's Advisory Assistance Programme (AAP)*, <https://www.umweltbundesamt.de/themen/nachhaltigkeit-strategien-internationales/kooperation-in-mittel-osteuropa-dem-kaukasus/projekt-datenbank-des-beratungshilfeprogramms/verbesserung-der-sicherheit-bergbaulicher>

¹⁸ <https://www.umweltbundesamt.de/publikationen/improving-the-safety-of-industrial-tailings>.

¹⁹ <http://www.icpdr.org/main/practical-tools-and-policy-recommendations-improve-safety-tailings-management-facilities-danube>





* Accident Hazard Sites are operating industrial and energy production facilities, with high potential risk of accidental pollution.
 ** Water Hazard Index (WHI) quantifies the accident hazard, considering the amount and hazardousness of the processed substances at the respective facility, without taking into account the safety measures implemented.
 *** Protected Areas as defined by the EU Bird Directive, EU Habitat Directive, and other Protected Areas for water-dependent species and water related habitats.

This ICPDR product is based on national information provided by the Contracting Parties to the ICPDR (AT, BA, BG, CZ, DE, HR, HU, MD, ME, RO, RS, SI, SK, UA) and CH. EuroGlobalMap data from EuroGeographics was used for all national borders except for AL, BA, ME where the data from the ESRI World Countries was used; Shuttle Radar Topography Mission (SRTM) from USGS Seamless Data Distribution System was used as elevation data layer; data from the European Commission (Joint Research Center) was used for the outer border of the DRBD of AL, IT, ME and PL.



* Preliminary database only, data have not been approved officially by RS and SI yet.

** Tailings Hazard Index (THI) quantifies the hazard potential of each TMF, considering the TMF capacity and management conditions, stored tailings toxicity, natural conditions (seismic activity and flooding), and stability of a dam slope.

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6. EMERGENCY WARNING

The Danube Accident Emergency Warning System (AEWS) is activated whenever there is a risk of transboundary water pollution, or threshold danger levels of hazardous substances are exceeded. The AEWS sends out international warning messages to countries downstream based on a predefined routing scheme. Details about each incident, such as time, place, involved substances, causes, observed effects, and counter measures taken, are collected in predefined forms and are automatically translated into the recipient's language. This helps the authorities to put environmental protection and public safety measures into action.

The system had to prove itself in 2000, during the Baia Mare and Baia Borsa spill accidents on the Tisza River. The system effectively enabled the timely activation of measures that prevented more extensive damage to people and ecosystems downstream along the Tisza River.

The AEWS operates on a network of Principal International Alert Centres (PIACs) in each of the participating countries (see *Map 3 and Table 1*). These centres are made up of three functional units:

- Communication Unit (operating 24 hours every day), which sends and receives warning messages;
- Expert Unit, which evaluates the possible transboundary impact of any accident using the database of dangerous substances;
- Decision Unit, which decides when international warnings are to be sent.

The APC EG developed the International Operations Manual for PIACs of the Danube AEWS²⁰, which describes the objectives, setup and international warning procedures of the Danube AEWS in every detail.

The first stage of the AEWS came into operation in April 1997 in Austria, Bulgaria, Czech Republic, Croatia, Germany, Hungary, Romania, Slovakia and Slovenia. Ukraine and Moldova entered the system in 1999; and Bosnia and Herzegovina and the Republic of Serbia are on board since 2005.

An essential improvement of AEWS was carried out in 2003/2004 with support of the UNDP/GEF Danube Regional Project. This upgrade increased the effectiveness and cost-efficiency of the warning system by replacing the satellite communication with an Internet-based information system using GSM/SMS messages for alerting the PIAC staff.

After ten years of operation of the Internet-based AEWS the experience confirmed a need for a further upgrade of the system. The new (AEWS 2.0) system was tested intensively concluding with a large-scale test, simulating scenarios of pollution in five river stretches moving downstream through several countries. The tests involved all PIACs and proved the functioning of the new system and the readiness of all PIACs to use it.

While in the original AEWS the messages were scattered and users had to go through all the incident

messages to find the information they needed, in the upgraded system, reports can be updated with additional information, while keeping everything in one incident report. In addition, the new system allows users to comment on reports, and upload attachments (such as photos, maps or spreadsheets).

The upgraded AEWS includes specific functions for transboundary incidents. If pollution moves from the first affected country to a second country and is expected to impact a third country, the second country must add their report for the same incident. All reports are collected on the same incident page, and the incident is closed only when the reports for each country have been closed.

The new AEWS has a simpler start page for easy navigation and highlights the relevant information and required actions for each PIAC. The report forms have been streamlined and simplified giving focus to essential information. Finally, the new system integrates a database of dangerous substances and interactive maps to display incident locations and help understand the potential impact of an incident.

The ICPDR Secretariat is operating and maintaining the Danube AEWS server. To ensure good performance and 24/7 preparedness of the Danube AEWS regular tests of the system are taking place twice a year. The APC EG is using the test results to continuously improve and fine-tune the system.

Besides the testing, the AEWS was triggered 11 times during the last 5 years because of a potential risk of transboundary water pollution – mainly due to an oil spill. In most of the cases, the pollutants could be removed from the river before reaching the next downstream country.

²⁰ ICPDR (2019): *International Operations Manual for Principal International Alert Centres of the Danube Accident Emergency Warning System.*



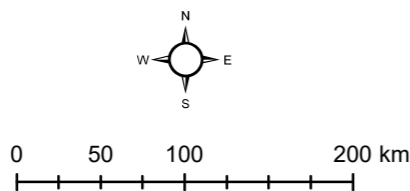


LEGEND

- Principal International Alert Centre (PIAC)
- Alerts Routing Links

- Danube River Basin District
- Danube River
- Tributaries (with catchment area > 4,000 km²)
- Lake water bodies (with surface area > 100 km²)
- Transitional water bodies
- Coastal water bodies
- Canals
- National borders

- Cities:
- 100,000 - 250,000 inhabitants
 - 250,000 - 1,000,000 inhabitants
 - > 1,000,000 inhabitants



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TABLE 1: AEWS Principal International Alert Centers (PIACs)

Country	Name	Town	Street address
DE	Water Management Office Deggendorf	Deggendorf	Detterstraße 20
AT	Federal Ministry for Interior – Coordination centre (EKC)	Vienna	Herrengasse 7
CZ	Morava River Board corp.	Brno	Drevarska 11
SK	Slovak Environmental Inspectorate	Bratislava	Grösslingová 5
HU	National Directorate General for Water Management	Budapest	Márvány u. 1/d
SI	Notification Center of the Republic of Slovenia	Ljubljana	Vojkova cesta 61
HR	Ministry of Economy and Sustainable Development State Inspectorate	Zagreb Zagreb	Radnička cesta 80 Šubićeva 29
BA	Bosnia and Herzegovina has not established a PIAC. Warning messages to the AEWS are sent by employees of the Sava River Watershed Agency and the Public Institution "Vode Srpske", who are appointed representatives to the ICPDR APC EG.		
RS	Ministry of Agriculture, Forestry and Water Management – Republic Water Directorate	Belgrade	Bulevar umetnosti 2a
RO	Ministry of Environment, Waters and Forests – Dispatching Center (COSU)	Bucharest	Calea Plevnei nr. 46-48
BG	Danube River Basin Directorate	Pleven	St. Chataldzha 60
MD	State Hydrometeorological Service General Inspectorate for Emergency Situations	Chisinau Chisinau	Grenoble str. 134 Gheorge Asachi str. 69
UA	Department of Ecology and Natural Resources of Zakarpatska Oblast State Administration, responsible for alerts in the Ukrainian part of the Tisza Basin	Uzhgorod	Ploscha Narodna 4
UA	Danube Basin Water Management Board of the State Agency of Water Resources of Ukraine, responsible for alerts on the Ukrainian section of the Danube (downstream Reni)	Izmail	Bolgradsyke Shose 27-a
UA	Danube Basin Water Management Board of the State Agency of Water Resources of Ukraine, responsible for alerts on the Ukrainian section of the Danube (downstream Reni)	Izmail	Bolgradsyke Shose 27-a



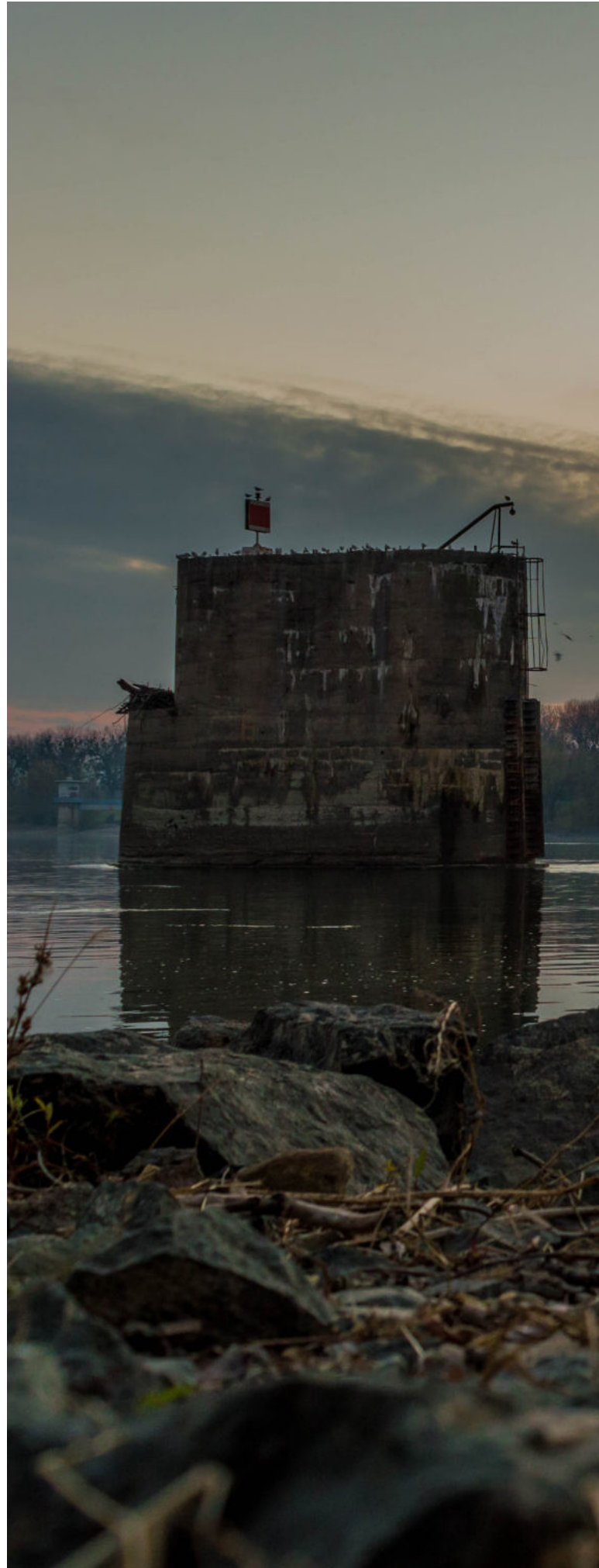


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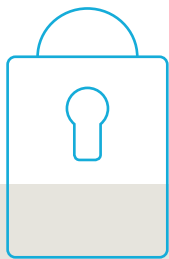
CONTINGENCY MANAGEMENT

The contingency planning and crisis management in the Danube countries are based on bi- or multilateral cross-border agreements, cooperation, exchange and exercises, which are proven to be sufficient. The APC EG provides a platform for regular information exchange on bi- or multilateral contingency exercises carried out by neighbouring countries in the basin. Recently, the UNECE has developed a document on guiding principles and checklists for harmonized contingency management²¹, which was tested in the Danube Delta to establish a trilateral agreement on crisis management. The UNECE document serves as a basis for any coordinated transboundary crisis management and it is recommended for the Danube countries to integrate their existing approaches into the guidance.

²¹ UNECE (2016): *Checklist for contingency planning for accidents affecting transboundary waters, with introductory guidance.*







8. PROTECTED AREAS

Accidental pollution can significantly harm aquatic ecosystems, people and socio-economic goods, which need to be effectively protected against any adverse impacts. Besides the accident hazard hot-spots (see Chapter 5) Map 1 and 2 also illustrate designated surface water bodies, water-related protected areas (larger than 500 ha) designated for the protection of habitats, species, nature or biosphere, and major towns and cities with a population of more than 100,000 inhabitants.

In total, 975 river water bodies (rivers with catchment areas larger than 4,000 km²) and 7 lake water bodies (water surface area larger than 100 km²) have been delineated for the DRB. These water bodies concern an overall river length²² of more than 29,000 km and a total lake surface area of more than 2,600 km². For all of them, good ecological and chemical status has to be achieved by 2027 at latest.

Out of a total of ca 1,700 protected areas (larger than 500 ha), about 60% have been designated following the EU Habitats Directive²³, about 20% are bird protected areas under the EU Birds Directive²⁴ and 2% are protected under both Directives. All of them are designated Natura 2000 sites (EU-wide ecological network of protected areas). A significant share of the designated Natura 2000 sites is located along the Danube River. The remaining sites are mainly nature reserves and Biosphere Reserves declared by the UNESCO (United Nations Educational, Scientific and Cultural Organization).

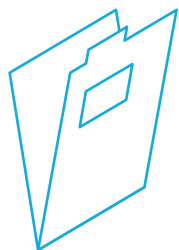
Nearly 80 million people in around 5,700 agglomerations live in the DRB. Around 40% of the DRB population live in ca. 110 major cities comprising more than 100,000 inhabitants.

²² Including double-counting for transboundary water bodies.

²³ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

²⁴ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.





9. RELEVANT ORGANISATIONS

Danube countries manage and coordinate the prevention and control of accidental pollution events through various international, national and regional administrative bodies and warning centres. In addition, countries operate a number of local civil protection and disaster management stations and units, which take actions on the ground in cases of emergency.

Tables 2-4 and Map 4 present the international alert centres, national competent authorities and relevant agencies and regional warning centres and water management bodies responsible for accident prevention, emergency warning and crisis management in the Danube countries.







This ICPDR product is based on national information provided by the Contracting Parties to the ICPDR (AT, BA, BG, CZ, DE, HR, HU, MD, RO, RS, SI, SK, UA) and CH, except for the following: EuroGlobalMap from EuroGeographics was used for national borders of AT, CZ, DE, HR, HU, MD, RO, SI, SK and UA; ESRI data was used for national borders of AL, ME, MK; Shuttle Radar Topography Mission (SRTM) from USGS Seamless Data Distribution System was used as topographic layer; data from the European Commission (Joint Research Center) was used for the outer border of the DRBD of AL, IT, ME and PL.

TABLE 2: Competent authorities and relevant agencies

Country	Name	Town	Street address	Comment
DE	Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV)	Berlin	Stresemannstraße 128-130	
DE	Environment Agency (UBA)	Dessau-Roßlau	Wörlitzer Platz 1	
DE	Bavarian State Ministry of the Environment and Consumer Protection (StMUV)	Munich	Rosenkavalierplatz 2	Bavaria
DE	Bavarian Environment Agency (LfU)	Augsburg	Bürgermeister-Ulrich-Straße 160	Bavaria
DE	Regional Council of Tübingen	Tübingen	Konrad-Adenauer-Str. 20	Baden-Württemberg
AT	Federal Ministry of Agriculture, Forestry, Regions and Water Management	Vienna	Stubenring 1	
AT	Federal Ministry for Interior	Vienna	Herrengasse 7	
CZ	Ministry of the Environment of the Czech Republic	Praha	Vršovická 1442/65	Implementation of the Seveso Directive
CZ	Czech Environmental Inspectorate	Brno	Lieberzeitova 14	Territorial inspectorate
SK	Ministry of Environment of the Slovak Republic	Bratislava	Námestie Ľudovíta Štúra 35/1	
SK	Slovak Environmental Inspectorate	Bratislava	Grösslingová 5	
SK	Slovak Environment Agency	Banska Bystrica	Tajovského 28	
HU	National Directorate General for Water Management	Budapest	Márvány u. 1/d	AEWS, early warning
HU	National Directorate General for Disaster Management	Budapest	Mogyoródi út 43	Accident prevention
SI	Administration for Civil Protection and Disaster Relief of the Republic of Slovenia	Ljubljana	Vojkova cesta 61	
SI	Slovenian Environment Agency	Ljubljana	Vojkova cesta 1	Expert unit hydrological forecast

Country	Name	Town	Street address	Comment
SI	Ministry of the Environment and Spatial Planning – Environment Directorate	Ljubljana	Dunajska 48	Responsible for policy design and for managing environmental impact assessment process and for issuing environmental permits for SEVESO and IED establishments
HR	Ministry of the Interior, Civil Protection Directorate	Zagreb	Nehajska 5	Communication Unit performs operational duty, reception and transfer of information
HR	Croatian Waters	Zagreb	Ulica grada Vukovara 220	Expert unit performs expert judgement of potential consequences of water pollution, organizes and coordinates the implementation of measures
HR	Ministry of Economy and Sustainable Development	Zagreb	Radnička cesta 80	
HR	State Inspectorate	Zagreb	Šubićeva 29	
BA	Ministry of Spatial Planning, Construction and Ecology Republic of Srpska	Banja Luka	Trg Republike Srpske 1	Responsible for issuing environmental permits for SEVESO and IED for Republic of Srpska
BA	Ministry of Agriculture, Forestry and Water Management Republic of Srpska	Banja Luka	Trg Republike Srpske 1	Water management coordination on accidental pollution activities
BA	Federal Ministry of the Environment and Tourism	Sarajevo	Hamdije Čemerlića 2, 71000 Sarajevo	Responsible for issuing environmental permits and implementation of IED for Federation of BiH
BA	Ministry of Agriculture, Water Management and Forestry of the Federation of Bosnia and Herzegovina	Sarajevo	Hamdije Čemerlića 2, 71000 Sarajevo	Responsible for water management development policies
BA	Sava River Watershed Agency	Sarajevo	Hamdije Čemerlića 39 A	Responsible for water management in the Sava River Basin in Federation of BiH
BA	Public Institution “Vode Srpske”	Bijeljina	Miloša Obilića 51	Responsible for water management in the Sava River Basin District of Republic of Srpska

TABLE 2: Competent authorities and relevant agencies

Country	Name	Town	Street address	Comment
RS	Ministry of Agriculture, Forestry and Water Management – Republic Water Directorate	Belgrade	Bulevar umetnosti 2a	Coordination of ICPDR activities
RS	Ministry of Environmental Protection	Belgrade	Omladinskih brigada 1	Coordination of the implementation of the provisions of IED Directive and Seveso III Directive at national level
RO	Ministry of Environment, Waters and Forests	Bucharest	Bulevardul Libertății nr. 12	Coordination of the implementation of the provisions of IED Directive and Seveso III Directive at national level. Water management coordination on accidental pollution activities
RO	National Administration Romanian Waters	Bucharest	Str. Edgar Quinet nr. 6	Water management coordination on accidental pollution activities
RO	National Agency for Environmental Protection	Bucharest	Splaiul Independentei, nr.294	Coordination of the implementation of the provisions of IED Directive and Seveso III Directive at national level
RO	National Guard for Environment	Bucharest	B-dul. Unirii, nr.78	Coordination of the implementation of the provisions of IED Directive and Seveso III Directive at national level
BG	Ministry of Environment and Water	Sofia	Bul. Maria Luiza 24	
BG	Executive Environmental Agency	Sofia	Bul. Tzar Boris III 136	
MD	State Hydrometeorological Service	Chisinau	Grenoble str. 134	
MD	General Inspectorate for Emergency Situations	Chisinau	Gheorge Asachi str. 69	
UA	State Emergency Service of Ukraine	Kyiv	O.Gonchara str. 55-a	Head office, structure of the State Emergency Service of Ukraine includes the Main Boards and Boards in each oblast (region)

Country	Name	Town	Street address	Comment
UA	State Agency of Water Resources of Ukraine	Kyiv	Velyka Vasylykivsyka str. 8	Head office, structure of the State Agency of Water Resources of Ukraine includes Basins Water Management Boards and Regional Boards of Water Resources
UA	Ministry of Ecology and Natural Resources of Ukraine	Kyiv	Metropolitan Basil Lypkivskyi str. 35	Formally Ministry is responsible for implementation of IED

TABLE 3: Central civil protection/disaster management units

Country	Name	Town	Street address	Comment
DE	Bavarian State Ministry of the Interior, for Sport and Integration (StMI)	Munich	Odeonsplatz 3	Bavaria
DE	Bavarian State Ministry of the Environment and Consumer Protection (StMUV)	Munich	Rosenkavalierplatz 2	Bavaria
DE	Regional Council of Tübingen	Tübingen	Konrad-Adenauer-Str. 20	Baden-Württemberg
AT	Federal Ministry for Interior, Department II/13	Vienna	Herrengasse 1	
CZ	Ministry of the Interior of the Czech Republic	Praha	Nad Štolou 3	
SK	Ministry of interior of the Slovak Republic	Bratislava	Pribinova 2	
HU	National Directorate General for Disaster Management	Budapest	Mogyoródi út 43	
SI	Administration for Civil Protection and Disaster Relief of the Republic of Slovenia	Ljubljana	Vojkova cesta 61	
HR	Ministry of the Interior, Civil Protection Directorate	Zagreb	Nehajska 5	
BA	Federal Civil Protection Administration	Sarajevo	Vitomira Lukića 10	
BA	Republic Civil Protection Administration	Istočno Sarajevo	Spasovdanska 3	
RS	Ministry of Interior, Sector for Emergency Situation	Belgrade	Omladinskih brigada 31	Coordination of the activities for protection and interventions activities in case of emergency situations and disaster and major accidents
RO	Ministry of Internal Affairs - General Inspectorate for Emergency Situations	Bucharest	Str. Banu Dumitrache 46	Coordination of the activities for protection and interventions activities in case of emergency situations and disaster and major accidents
BG	Ministry of the Interior, Fire Safety and Civil Protection General Directorate	Sofia	Ulitsa Pirotska 171A	
MD	General Inspectorate for Emergency Situations	Chisinau	Gheorge Asachi str. 69	
UA	State Emergency Service of Ukraine	Kyiv	O.Gonchara str. 55-a	Head office, structure of the State Emergency Service of Ukraine includes the Main Boards and Boards in each oblast (region)

TABLE 4: Regional water management bodies and warning centres

Country	Name	Town	Street address	Comment
DE	Regional Warning Center, Water Management Office Donauwörth	Donauwörth	Förgstraße 23	Bavaria
DE	Regional Warning Center, Regional Council of Tübingen	Tübingen	Konrad-Adenauer-Str. 20	Baden-Württemberg
AT	Regional Alert Centre Vienna	Wien	Am Hof 9	No direct border with any neighbouring country
AT	Regional Alert Centre Lower Austria	Tulln	Langenlebarner Str. 106	No direct border between Lower Austria and Hungary
AT	Regional Alert Centre Burgenland	Eisenstadt	Europaplatz 1	
AT	Regional Alert Centre Styria	Graz	Paulustorgasse 4	No direct border between Styria and Hungary
AT	Regional Alert Centre Carinthia	Klagenfurt	Rosenegger Straße 20	Gail: Carinthia is downstream of Italy
AT	Regional Alert Centre Upper Austria	Linz	Petzoldstraße 43	
AT	Regional Alert Centre Salzburg	Salzburg	Karolingerstraße 30	
AT	Regional Alert Centre Tyrol	Innsbruck	Hunoldstraße 17a	Drau: Tyrol is downstream of Italy and upstream of Carinthia Inn: Tyrol is downstream of Switzerland an upstream of Bavaria
CZ	Regional Authority of South-Moravia region	Brno	Žerotínovo nám. 449/3	Seveso Directive implementation
HU	Lower-Danube-Valley Regional Water Management Directorate	Baja	Széchenyi utca 2/c	Regional warning center, reports to PIAC
HU	Lower-Tisza-Valley Regional Water Management Directorate	Szeged	Stefánia utca 4	Regional warning center, reports to PIAC
HU	South-Transdanubian Regional Water Management Directorate	Pécs	Köztársaság tér 7	Regional warning center, reports to PIAC
HU	North-Transdanubian Regional Water Management Directorate	Győr	Árpád út 28-32	Regional warning center, reports to PIAC
HU	North-Hungarian Regional Water Management Directorate	Miskolc	Vörösmarty utca 77	Regional warning center, reports to PIAC
HU	Upper-Tisza-Valley Regional Water Management Directorate	Nyíregyháza	Széchenyi utca 19	Regional warning center, reports to PIAC
HU	Körös-Valley Regional Water Management Directorate	Gyula	Városház utca 26	Regional warning center, reports to PIAC

TABLE 4: Regional water management bodies and warning centres

Country	Name	Town	Street address	Comment
HU	Middle-Transdanubian Regional Water Management Directorate	Székesfehérvár	Balatoni út 6	Regional warning center, reports to PIAC
HU	Middle-Danube-Valley Regional Water Management Directorate	Budapest	Rákóczi út 41	Regional warning center, reports to PIAC
HU	Middle-Tisza-Valley Regional Water Management Directorate	Szolnok	Boldog Sándor István körút 4	Regional warning center, reports to PIAC
HU	West-Transdanubian Regional Water Management Directorate	Szombathely	Vörösmarty utca 2	Regional warning center, reports to PIAC
HU	Trans-Tisza Regional Water Management Directorate	Debrecen	Hatvan utca 8-10	Regional warning center, reports to PIAC
SI	Regional Centre Murske Sobota	Murska Sobota	Cankarjeva 75	Neighbouring county contact in case of emergency
SI	Regional Centre Ptuj	Ptuj	Slomškova ulica 10	Neighbouring county contact in case of emergency
SI	Regional Centre Celje	Celje	Maistrova ulica 5	Neighbouring county contact in case of emergency
SI	Regional Centre Brežice	Brežice	Cesta svobode 15	Neighbouring county contact in case of emergency
SI	Regional Centre Novo Mesto	Novo Mesto	Seidlova 1	Neighbouring county contact in case of emergency
HR	Croatian Waters - Water Management Department for the Upper Sava River	Zagreb	Ulica grada Vukovara 271	Prevention and intervention measures on accidental pollution events
HR	Croatian Waters - Water Management Department for the Middle and Lower Sava River	Slavonski Brod	Šetalište braće Radića 22	Prevention and intervention measures on accidental pollution events
HR	Croatian Waters - Water Management Department for the Mura and Upper Drava Rivers	Varaždin	Kratka 1	Prevention and intervention measures on accidental pollution events
HR	Croatian Waters - Water Management Department for the Danube and Lower Drava Rivers	Osijek	Splavarska 2a	Prevention and intervention measures on accidental pollution events
HR	State Inspectorate District Office Zagreb	Zagreb	Šubićeva 29	Regional inspectorates are responsible on a regional level
HR	State Inspectorate District Office Varaždin	Varaždin	Stanka Vraza 4	Regional inspectorates are responsible on a regional level
HR	State Inspectorate District Office Osijek	Osijek	Ulica Hrvatske Republike 21	Regional inspectorates are responsible on a regional level

Country	Name	Town	Street address	Comment
BA	Public Institution "Vode Srpske"	Bijeljina	Miloša Obiliša 51	Activities for prevention and coordination of the interventions in case of water pollution for the Sava River Basin District of Republic of Srpska
BA	Sava River Watershed Agency	Sarajevo	Hamdije Čemerlića 39 a	Activities for prevention and coordination of the interventions in case of water pollution for the Sava River Basin in Federation of BiH
RO	Banat Water Management Administration	Timișoara	bd. Mihai Viteazul 32	Prevention and intervention measures on accidental pollution events; elaboration and implementation of the accidental pollution plans at the river basin level
RO	Jiu Water Management Administration	Craiova	str. Dunării 48	Prevention and intervention measures on accidental pollution events; elaboration and implementation of the accidental pollution plans at the river basin level
RO	Olt Water Management Administration	Râmnicu Vilcea	str. Remus Belu 6	Prevention and intervention measures on accidental pollution events; elaboration and implementation of the accidental pollution plans at the river basin level
RO	Argeș Water Management Administration	Pitești	str. Câmpulung 6-8	Prevention and intervention measures on accidental pollution events; elaboration and implementation of the accidental pollution plans at the river basin level
RO	Dobrogea-Litoral Water Management Administration	Constanța	bd. Mircea cel Bătrân 127	Prevention and intervention measures on accidental pollution events; elaboration and implementation of the accidental pollution plans at the river basin level
RO	Buzău -Ialomița Water Management Administration	Buzau	str. Bucegi 20	Prevention and intervention measures on accidental pollution events; elaboration and implementation of the accidental pollution plans at the river basin level

TABLE 4: Regional water management bodies and warning centres

Country	Name	Town	Street address	Comment
RO	Prut Water Management Administration	Iasi	str. Theodor Văscăuțeanu 10	Prevention and intervention measures on accidental pollution events; elaboration and implementation of the accidental pollution plans at the river basin level
BG	Regional Inspectorate for Environment and Water	Sofia		Regional inspectorates are responsible on a regional level
BG	Regional Inspectorate for Environment and Water	Pernik		Regional inspectorates are responsible on a regional level
BG	Regional Inspectorate for Environment and Water	Montana		Regional inspectorates are responsible on a regional level
BG	Regional Inspectorate for Environment and Water	Vratza		Regional inspectorates are responsible on a regional level
BG	Regional Inspectorate for Environment and Water	Pleven		Regional inspectorates are responsible on a regional level
BG	Regional Inspectorate for Environment and Water	Veliko Tarnovo		Regional inspectorates are responsible on a regional level
BG	Regional Inspectorate for Environment and Water	Ruse		Regional inspectorates are responsible on a regional level
BG	Regional Inspectorate for Environment and Water	Shumen		Regional inspectorates are responsible on a regional level
MD	Regional Emergency Situation Directorate	Cahul	Dunarii str. 9	Regional level
UA	Odesa Regional State Administration	Odesa	Prospect Shevchenka 4	Structure includes Department of civil protection, defence affairs and cooperation with law-enforcement agencies and Department of Ecology and natural Resources (Lower part of the Danube)
UA	Board of the State Emergency Service of Ukraine in Odesa Region	Odesa	Prokhorivsyka str. 6	Structure includes Sectors in Reni, Izmail, Kilia, towns at the bank of the lower section of the Danube (Ukrainian territory)
UA	Zakarpatska Regional State Administration	Uzhgorod	Ploscha Narodna 4	Structure includes Department of Environment and Natural Resources and Office of Civil Defence (Tisza)
UA	Board of the State Emergency Service of Ukraine in Zakarpatska Region	Uzhgorod	Bolgarsyka str. 2	Structure includes Special Emergency Rescue Unit

Country	Name	Town	Street address	Comment
UA	Ivano-Frankivsyk Regional State Administration	Ivano-Frankivsyk	Grushevsykogo str. 21	Structure includes Board of Ecology and Natural Resources and Board of Civil Protection Affairs (Prut, Siret)
UA	Board of the State Emergency Service of Ukraine in Ivano-Frankivsyk Region	Ivano-Frankivsyk	Franka str. 6	Structure includes Special Emergency Rescue Unit
UA	Chernivtsi Regional State Administration	Chernivtsi	Grushevsykogo str. 1	Structure includes Board of Ecology and Natural Resources and Board of Population Civil Protection. (Siret)
UA	Board of the State Emergency Service of Ukraine in Chernivtsi Region	Chernivtsi	Komarova str. 1a	Structure includes Special Emergency Rescue Unit



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