

**Subregional Workshop on Mine Tailings Safety and the Prevention of  
Accidental Water Pollution in Central Asia,  
May 25-26, 2023, Dushanbe, Tajikistan, online**

Inventory and mapping of tailings  
in the river basin  
Syr Darya - Overview of major  
hazards and risks

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# Tasks set when creating a map

**Provide a practical and easy-to-use tool, including for staff who do not have access to specific software**

Mapping of tailings with high THI and TRI (for national and international assessment)

Display basic information about each individual tailing and the country as a whole

Assessment of possible transboundary impact

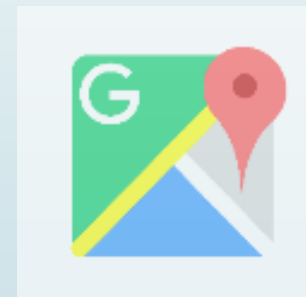
Risk assessment

Ease and accessibility to use

✓ **Map of tailings in the Syr Darya River basin  
(in Russian and English)**



Offline maps  
(Google earth)



Online maps  
(Google my maps)

# Available map layers of tailings in the Syr Darya River basin

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Tailings of  
Uzbekistan

Tailings of Tajikistan

Tailings of  
Kazakhstan

Tailings of  
Kyrgyzstan

Transboundary  
tailings

THI ranking for all  
countries (national  
level)

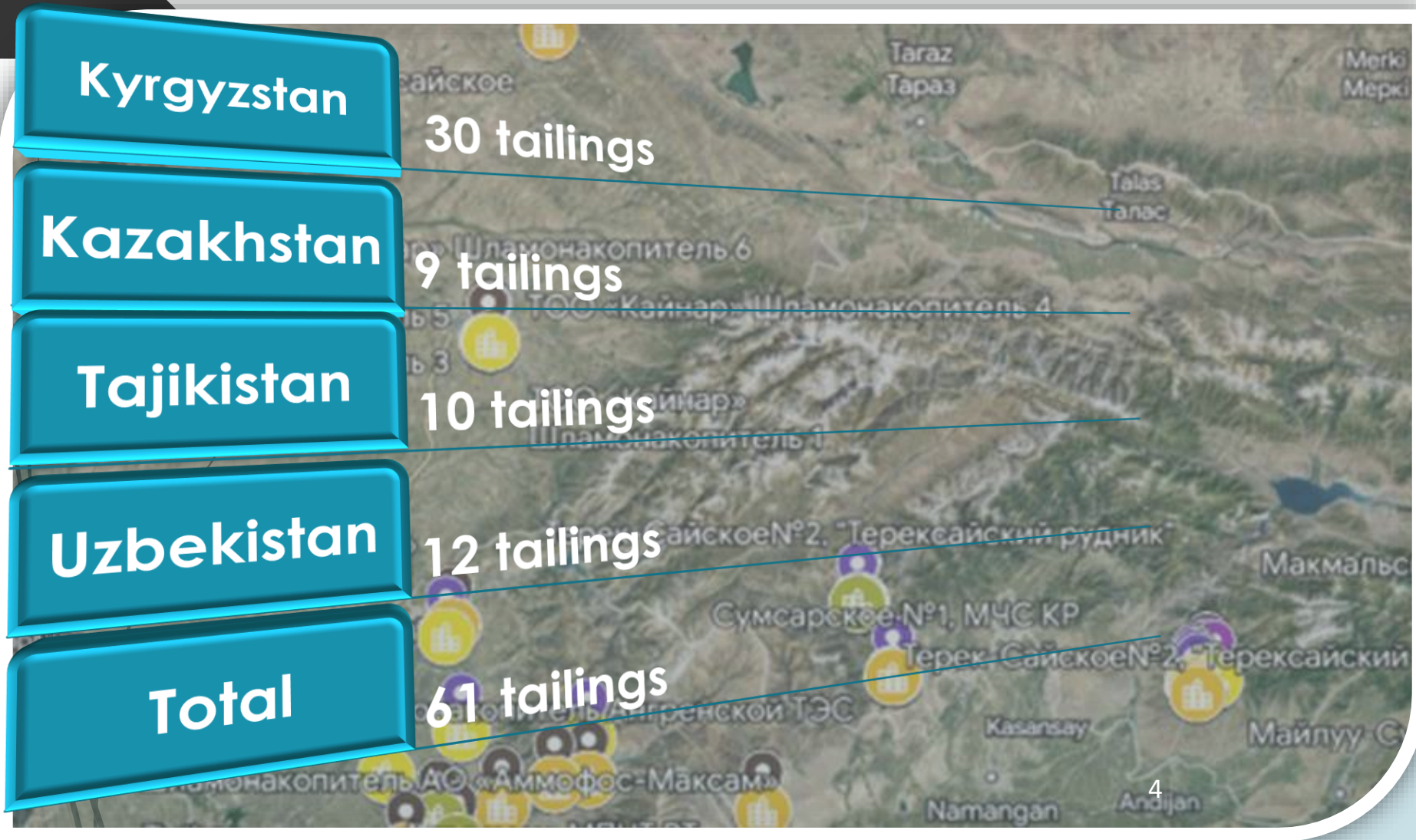
TRI ranking for all  
countries (national  
level)

Ranking by THI on  
international  
gradation

Ranking by TRI on  
international  
grading



# Map of tailings in the Syr Darya River basin



**In 2019**, a separate map of tailings was created for Kazakhstan (121 tailings) and Tajikistan (13 tailings)

# Ranking by THI and TRI for evaluation by the international system:

RANKING BY TAILINGS HAZARD INDEX (THI)	RANKING BY TAILINGS RISK INDEX (TRI)
very low ( $THI \leq 8$ )	very low ( $TRI \leq 13$ )
low ( $8 < THI \leq 10$ )	low ( $13 < TRI \leq 15.5$ )
medium ( $10 < THI \leq 12$ )	medium ( $15.5 < TRI \leq 18$ )
high ( $12 < THI \leq 14$ )	high ( $18 < TRI \leq 20.5$ )
very high ( $THI > 14$ )	very high ( $TRI > 20.5$ )

## Total tailings:

very high-28, high - 27, medium - 6

Of them:

In Kazakhstan: medium – 2, very high– 7,

In Uzbekistan: high – 4, very high– 8,

In Kyrgyzstan: medium– 7, high – 17, very high– 6

All tailings in Tajikistan are classified as very high risk

## Total tailings:

very high-28, high - 27, medium - 6

Of them:

In Kazakhstan: high – 2, overly high– 7,

In Uzbekistan: high – 3, very high– 9,

In Kyrgyzstan: medium–6, high – 22, very high– 2

In Tajikistan: high – 1, very high– 9

# Ranking by THI and TRI for the national level

This approach has been used in previous UNECE projects

The approach agreed upon for use in European countries

## THI range for 2019

**Low level  
(35%)**

**42 – Kazakhstan  
3 – Tajikistan**

**Medium level  
(50%)**

**61 – Kazakhstan  
6 – Tajikistan**

**High Level  
(15%)**

**18 – Kazakhstan  
2 – Tajikistan**

## Ranking range for 2023

**Low level  
(35%)**

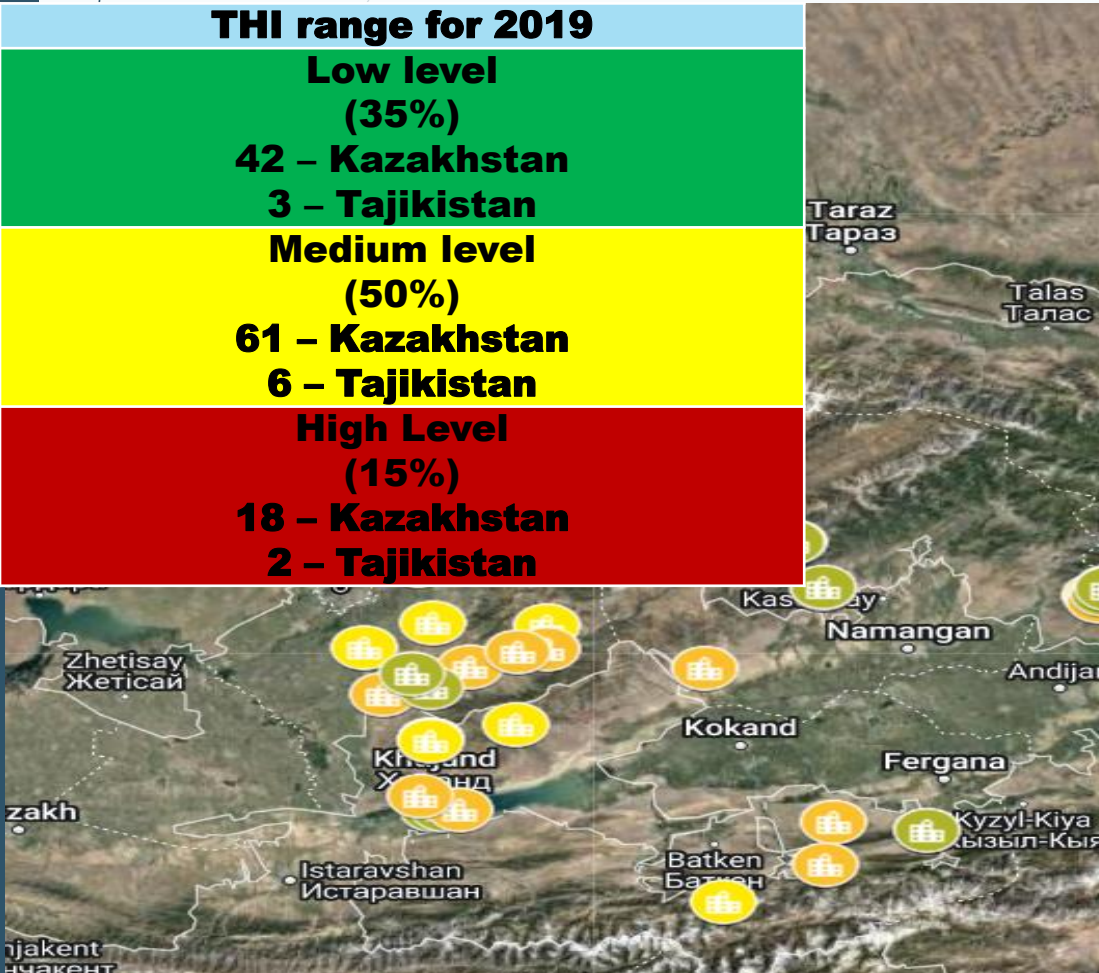
**1 – Kazakhstan  
5 – Kyrgyzstan  
3 – Tajikistan  
4 – Uzbekistan**

**Medium Level  
(50%)**

**5 – Kazakhstan  
15 – Kyrgyzstan  
5 – Tajikistan  
6 – Uzbekistan**

**High Level  
(15%)**

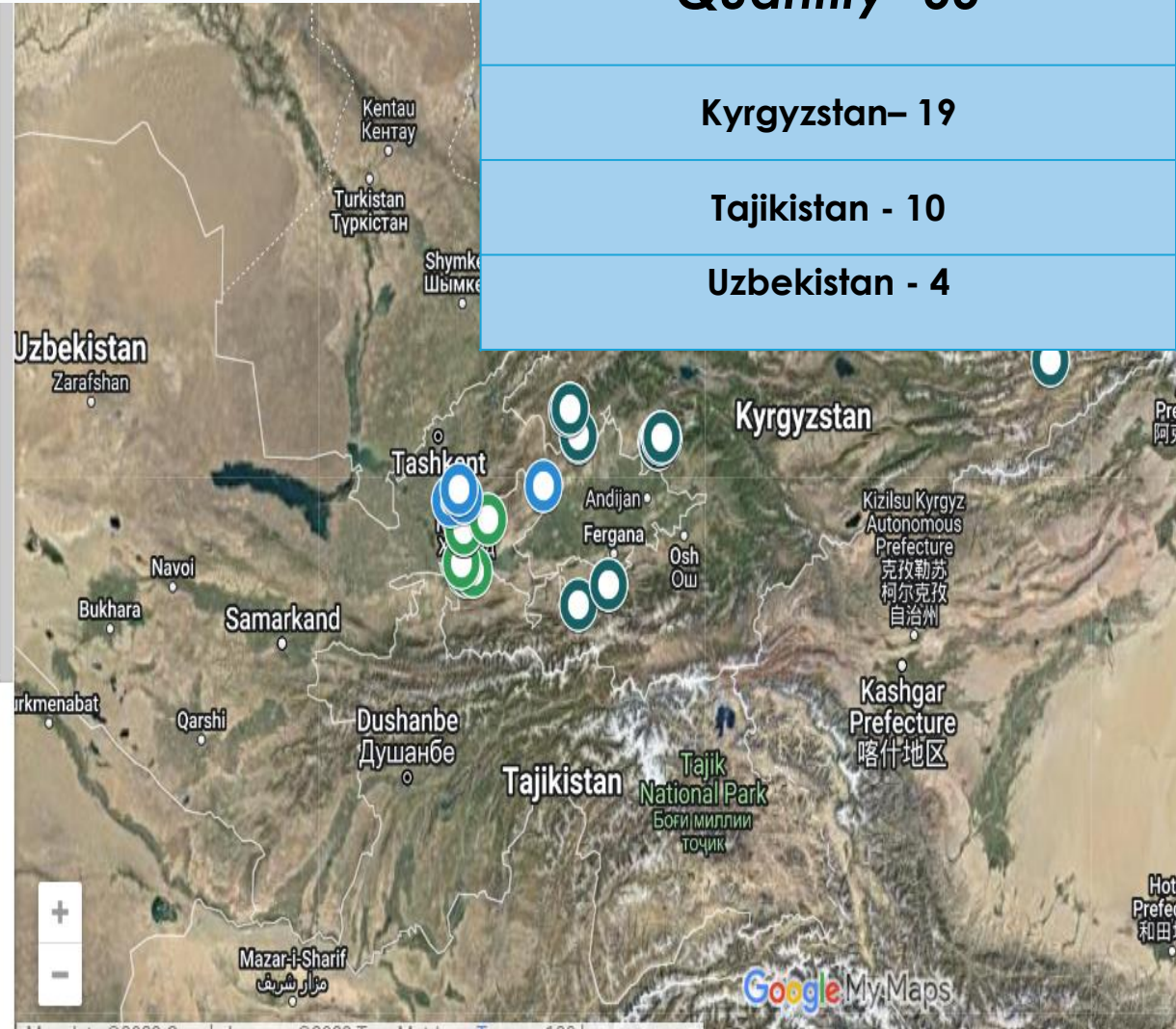
**3 – Kazakhstan  
10 – Kyrgyzstan  
2 – Tajikistan  
2 – Uzbekistan**



# Tailings with a possible transboundary effect (map example)

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- Хвостохранилища Узбекистана (12)
- Хвостохранилища Таджикистана (10)
- Хвостохранилища Казахстана (9)
- Хвостохранилища Кыргызстана (30)
- Трансграничные хвостохранилища (33)
  - ▼  Кыргызстан
  - Таджикистан
  - Узбекистан
- Ранжирование по ИОХ для всех стран ...



**Quantity -33**

**Kyrgyzstan- 19**

**Tajikistan - 10**

**Uzbekistan - 4**

# Information on individual tailings

## New map

The name of the tailings  
 Nearest Settlement  
 latitude, longitude  
 Capacity used (million m<sup>3</sup>)  
 Type of material  
 Toxic substances  
 Toxicity of substances (Water hazard class)  
 Tailings dam status  
 Settlements at risk  
 Nearest water body at risk  
 The year to which the data relates  
 Transboundary effect  
 Tailings Dam Hazard Index  
 Tailings Dam Risk Index  
 THI ranking  
 TRI ranking  
 International level of ranking on THI  
 International level of ranking on TRI  
 Country

**VS**

## 2019 Map

The name of the tailings  
 Region, city/district  
 Latitude, longitude  
 Volume of stored materials of tailings  
 Stored Material  
 Hazard class  
 Status  
 Maximum horizontal acceleration of the ground  
 Flood frequency (HQ-100)  
 Dam: Material  
 Dam: width of the ridge  
 Year of commissioning  
 THI  
 THI range



# Using the Map Legend

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Карта подготовлена в рамках первого этапа проекта Европейской экономической комиссии Организации Объединенных Наций (ЕЭК ООН) «Разработка совместных мер по предупреждению и реагированию на загрязнение р. Сырдарья при аварийных ситуациях».

Количество хвостохранилищ в бассейне р Сырдарья - всего 61

в Казахстане – 9

в Кыргызстане – 30

в Таджикистане – 10

в Узбекистане - 12

Количество хвостохранилищ с возможным трансграничным эффектом -33

в Казахстане – 0

в Кыргызстане – 19

в Таджикистане - 10

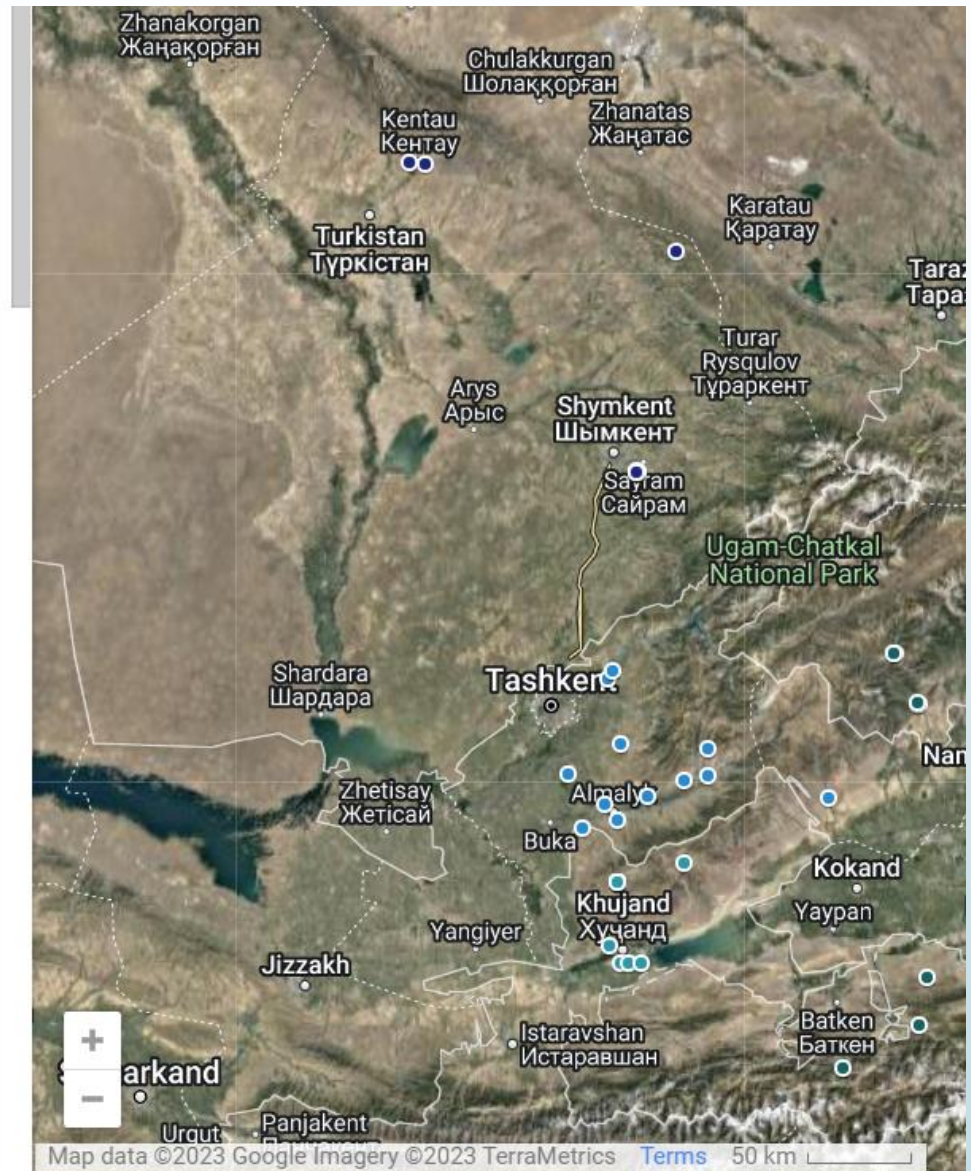
в Узбекистане - 4

Ранжирование по ИОХ и ИРХ для национального уровня:

Ранжирование для Казахстана

низкий уровень 1 х-щ

средний уровень -5 х-щ



# Aspects of information visualization on the example of the Tajik tailings

← Дигмайское, МПНТ РТ.

Название хвостохранилища

Дигмайское, МПНТ РТ.

Ближайший населённый пункт

Пос. Гозиён

Долгота

69.624488

Широта

40.225004

Используемая ёмкость (млн м<sup>3</sup>)

объект

Тип материала

19.400

Токсичные вещества

Радионуклиды, U, Pu, Th, Rh, Po, соли Cd, Pb, Zn, цианиды.

Токсичность веществ (Класс опасности для воды)


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DeepSpaceEight  
Internet access

Detsk Keyboard shortcuts

# Main conclusions

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- ▶ The map provides a useful tool for competent authorities to collect and analyze information on the hazards of facilities and to take preventive measures to prevent emergencies with adverse effects on the environment and public health.
  - ▶ The updated map is improved compared to the 2019 map and contains more relevant and useful information about individual tailings.
  - ▶ New layers have been added to visually assess the ranking of tailings by hazard and risk level both nationally and internationally.
  - ▶ The map allows us to identify affected areas, including human settlements and contaminated water bodies, in the event of an industrial accident.
  - ▶ This map can be used for integration into the cadastral system of the country.
  - ▶ The map provides countries with an overview of hazardous facilities and tailings in order to subsequently take additional safety measures by the relevant competent authorities.



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Thank you for your attention!