
# REMTECH EUROPE International Conference

## Management of contaminated sites in Slovakia and Mongolia due to former Soviet army activities

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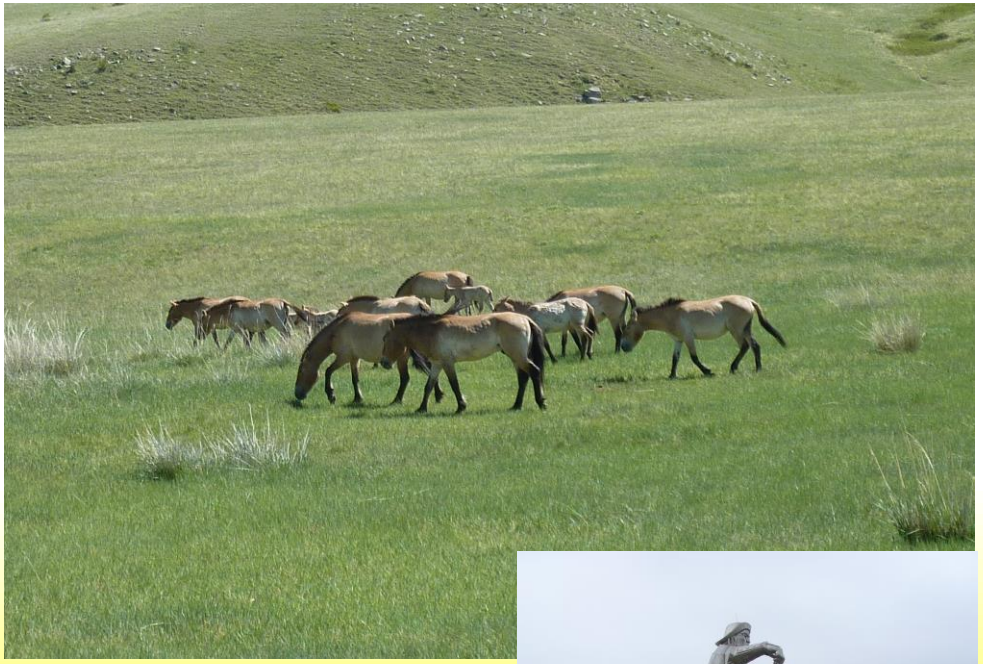
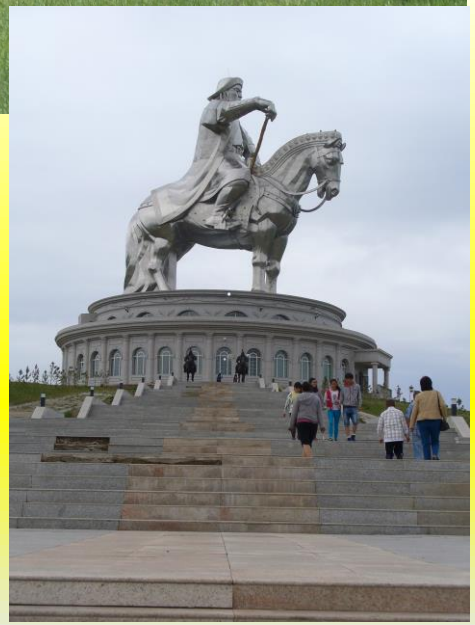
*www.remtechexpo.com*

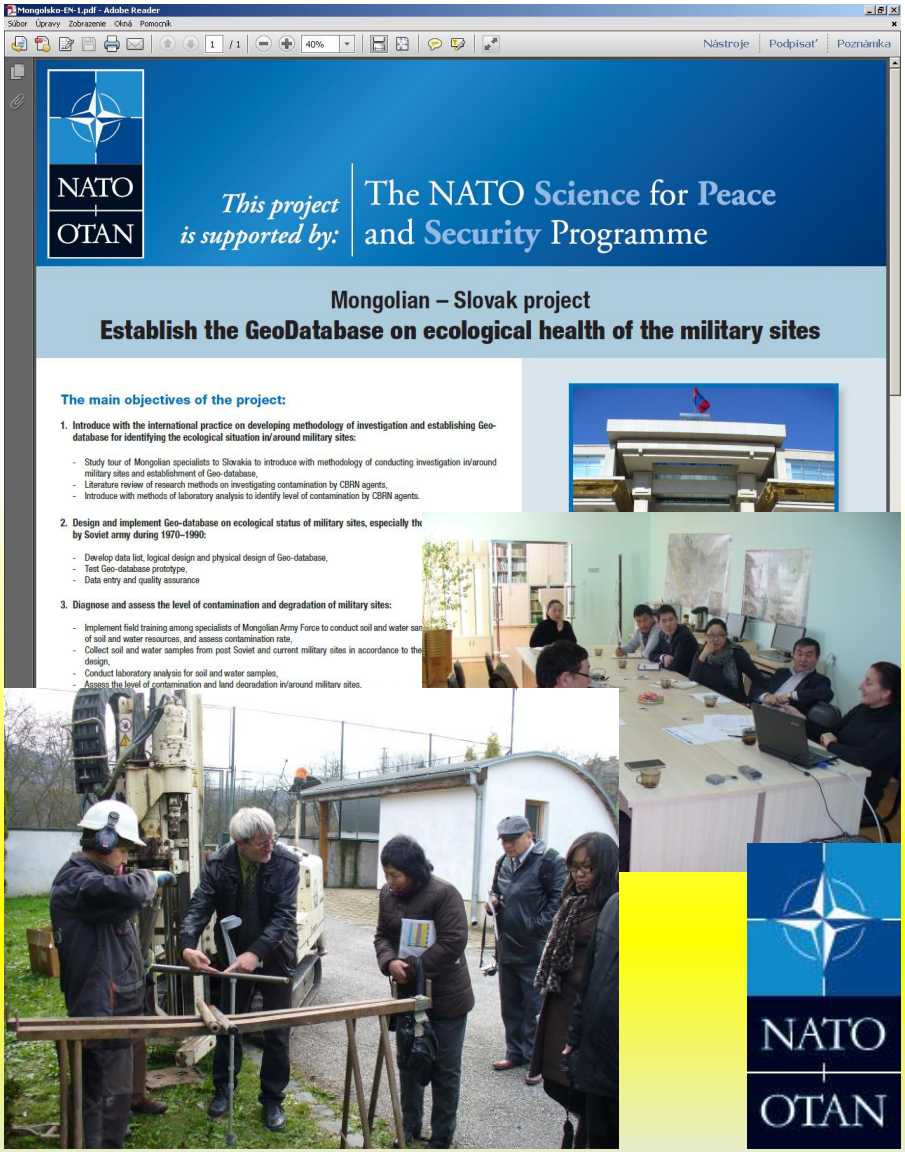
# Mongolia





# Establish the GeoDatabase on ecological health of the military sites

- Introduce with the international practice on developing methodology of investigation and establishing GeoDatabase for identifying the ecological situation in/around military sites
- Design and implement GeoDatabase on ecological status of military sites, especially those which are used by Soviet army during 1970 – 1990
- Diagnose and assess the level of contamination and degradation of military sites
- Develop scientific justifications for decontamination and rehabilitation of degraded military sites
- Project duration: 2013 – 2016
- Budget source: NATO (Science for Peace and Security Programme)
- Partners: Ministry of Defence of Mongolia, Environmental Information Centre, Institut of Geoecology
- Responsibility: Slovak Environment Agency



# Establish the Geo-Database on ecological health of the military sites

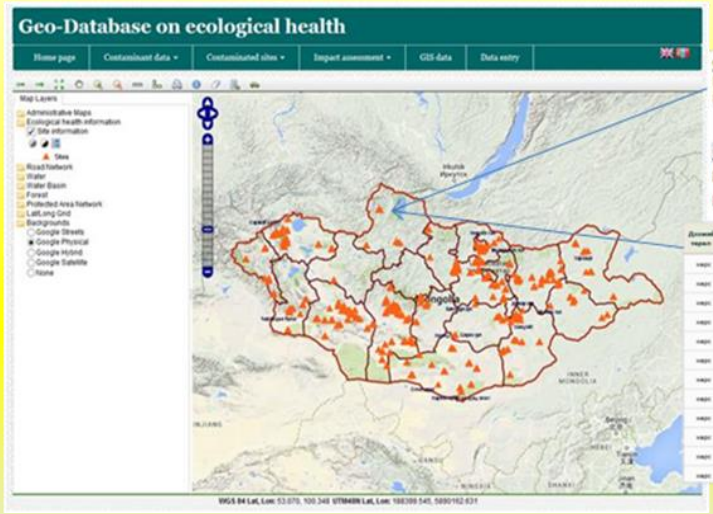
**Introduce with the international practice on developing methodology of investigation and establishing Geo-database for identifying the ecological situation in/around military sites**

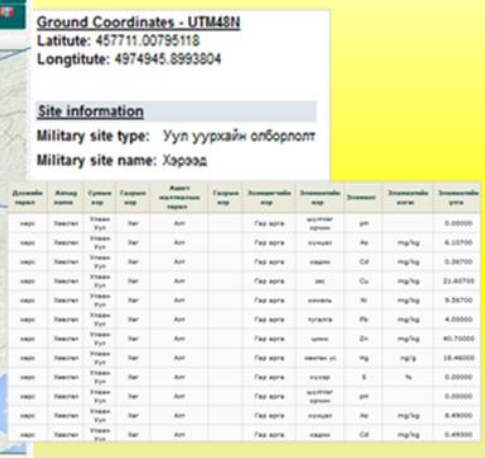
- Study tour of Mongolian specialists in Slovakia to introduce with methodology of conducting investigation in/around military sites and establishment of Geo-database
- Literature review of research methods on investigating contamination
- Introduce with methods of laboratory analysis to identify level of contamination

# Establish the Geo-Database on ecological health of the military sites

**Design and implement GeoDatabase on ecological status of military sites, especially those which are used by Soviet army during 1970 – 1990**

- Develop data list, logical and physical design of GeoDatabase
- Test the GeoDatabase
- Data entry and quality assurence

# Establish the Geo-Database on ecological health of the military sites

**Diagnose and assess the level of contamination and degradation of military sites**

- Implement field training among specialists of Mongolian Army Force to conduct soil and water sampling, visual analysis of soil and water resources, and assess contamination
- Collect soil and water samples from post Soviet and current military sites in accordance to the predefined sampling design
- Conduct laboratory analysis for soil and water samples
- Assess the level of contamination and land degradation in/around military sites
- Develop map of the level of contamination and land degradation in/around military sites

# Establish the Geo-Database on ecological health of the military sites

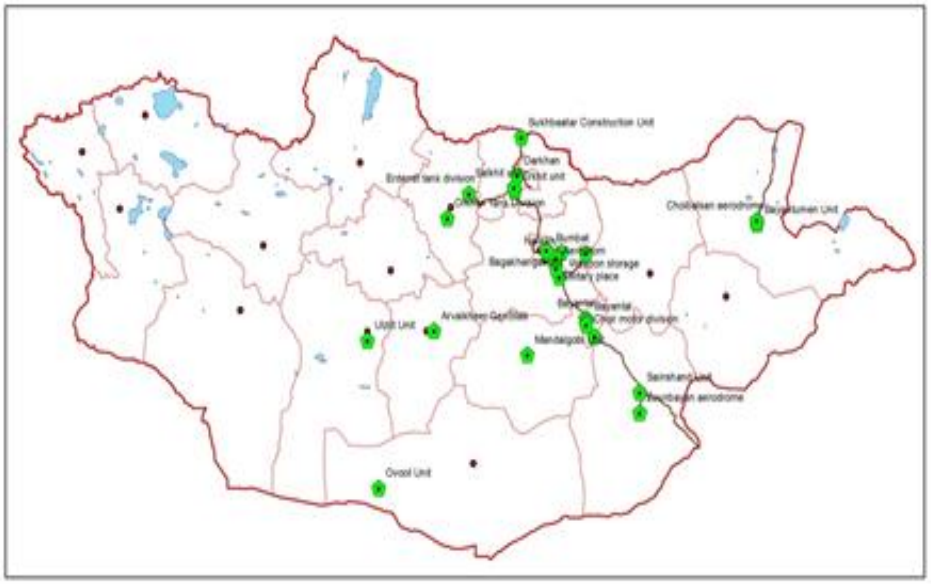
**Develop scientific justifications for decontamination and rehabilitation of degraded military sites**

- Conduct study tour to introduce with innovative methods of decontamination of contaminants from soil and water
- Develop Management plan for decontamination and rehabilitation of degraded military sites


# Soviet army in Mongolia

- Mongolia is one of the countries where the military activity was activated during post-WWII period. Unfortunately, little is known about the current ecological situation in areas where previously the military activities took place.
- According to the recent surveys, about 100,000 ha area has been directly affected by contamination, however the level of it and the main pollutants are still unrecognized.
- Approximately 500,000 people currently residing in and around those sites.
- 25 soviet units were located in Mongolia during 1970 – 1990 – 15 localities are currently used by Mongolian Armed Forces and 10 places have been already transferred to local authorities for civil society use.

# Military sites in Mongolia




*Location of main military units based in Mongolia during Soviet period (1970 – 1990)*

*The ruin of old heating plant in Bayantumen*

*Birds died in oil contaminated site*

*Artillery Shells (UXO) 122 mm Howitzer*

# GeoDatabase on ecological health of the military site


**www.eic.mn**

**www.eic.mn/envmonitor/**

# Mongolia – conclusion

- Mongolia has a waste territory and low population, which is primary factor of underdevelopment of the contamination issues in a country. However, recent research and the results of the current project point to critical situation in contamination. The preliminary investigation identifies that potential risk in currently contaminated sites to the public is high, and thus it is necessary to develop national strategy on contaminated site as well as implement remediation activities in those areas where the direct risk to population has already been defined.
- The former military sites in Mongolia experienced an active demolition, however, the proper management of these activities never been implemented, thus increased a risk of contaminant's discharge to deeper soil layers and possible to the underground aquifers. Unfortunately, there are no any surveys done in regards to assessment of the underground water contamination. So, it is suggested to implement more remarkable investigation and monitoring activities in critical areas to identify possible risks.

# Soviet Army in Slovakia

**Soviet Army**

**in in Slovakia** (former Czechoslovakia)

1968 – 1992

355 military objects


# Slovakia – former SA contaminated sites

- 78 potentially contaminated sites within 18 former Soviet Army areas were investigated
- 1 Airport + services area + fuel storage
- 1 Army training area – 260 km$^2$, included 18 part places (camps, shooting areas, garages, storages, farm etc.)
- 16 other military bases (caserne, garages, storages, shooting areas, etc.).
- Situated mainly in towns
- 15 sites were classified with very high risk

# Slovakia – remediation technologies (Sliač, Vlkanová)

## Groundwater remediation methods

- Pump and treat
- Pumping from wells and drains (4 drains deep cca 6 – 7 m, together cca 2 km long)
- Water was treated in 2 water treatment plants
- Water cleaned from contaminants was discharged back to groundwater through infiltration drainage

## Soil remediation methods

- Excavation and Biodegradation ex situ
- Biodegradation in situ
- Venting (soil gas pumping and treatment)
- Soil leaching

# Remediation of Contaminated Sites Left by the Soviet Army

- Project duration: 2014 – 2015
- Budget allocation:  cca 12,5 mil. €
- Budget source: Operational programme Environment
- State remediation program of contaminated sites (2010 – 2015)
- 6 localities
- Responsibility: Ministry of Defence of the Slovak Republic

# Komárno – the former military site



# THANKS FOR YOUR ATTENTION

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