UN Environment supports Serbian Environmental Protection Agency in the management of contaminated sites

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Enhanced Cross-sectoral Land Management through Land Use Pressure Reduction and Planning

- Project Duration: October 2015 – October 2018 (36 months)
- Project budget (GEF grant): 661,644 USD
- Executed by UN Environment Vienna Programme Office in close cooperation with Ministry of Environmental Protection and Serbian Environmental Protection Agency

The project aims at providing lacking methodologies, knowledge and coordination mechanisms for sustainable and integrated management of soil as a natural resource.
• Joint field visits to industrial contaminated sites in Serbia and Italy

• Training in several step of management of cont’d sites

• Technical assistance to SEPA in the development of Characterization plans

• Procurement activities (PPEs, laboratory equipment)
• Field missions and soil sampling in 37 industrial priority sites in 2016-2017 with the purpose to: confirm status of the sites, identify receptors of pollution and potential exposure routes, and prepare and elaborate sampling programs.

• Application of Preliminary Risk Assessment Model - PRA.MS

• Development of Characterisation Plans for abandoned chemical industries in Šabac and Loznica.

• Development of the Contaminated Sites module – an upgrade to SEPA’s Environmental Information System.
• Landfill of **jarosite** waste (estimated 330,000 t);

• **Zinc sulfate** (ZnSO4), 4 t stored in factory facilities;

• **Pyralene** waste, large amount stored in factory facilities;

• **Pb/Ag precipitate**
Sabac – Characterization plan in a nutshell

- 33.000 m²
- Geophysical survey
- 18 borings
- 6 groundwater monitoring wells
- Technical specification for drilling and sampling
- 54 soil samples and 6 GW
- Waste sampling
- QA/QC procedure
Loznica – Main sources

• Carbon disulfide (60 tons)
• Black liquor (600 m3)
• Furfural C5H4O2 (200 tons)
• Waste fuel oil, 20 tons
• Asbestos
• Too long to list.......
Loznica—Characterization plan in a nutshell

- Geophysical survey
- 66 borings
- 25 groundwater monitoring wells
- Technical specification for drilling and sampling
- 198 soil samples and 25 GW
- Waste sampling
- QA/QC procedure

http://www.rainews.it/dl/rainews/media/ContentItem-2825e291-c75c-48af-90fa-2865ae99a5c9.html
• The final version of two characterization plans has been delivered in June 2018
• UN Environment, with the support of IMELS and GEF, is supporting several countries in the Western Balkans through concrete projects
• Belgrade conference 4-5 December, expression of interest for environmental solutions in Balkans. Some will be also brought to UN conference in Nairobi next March 2019 https://reg.unog.ch/event/27105/
• For ISPRA, this capacity building exercise is extremely relevant: supporting neighbor countries to face problems that Italy has been dealing with since 20 years
• Definition of **chemical of concern for vapour migration pathway** on the basis of their physical characteristics;
• Update of **exposure parameters** for “inhalation pathway” on the basis of national studies;
• Definition of reference values (Cthreshold) in soil gas matrix for the **exclusion of volatilization pathway** from the CSM;
• Definition of **soil gas to ambient air attenuation factors** on the basis of experimental data
• Software Rome+

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https://www.commonforum.eu/Documents/Meetings/2018/Barcelona/3_1_CF_Ireland_Guidelines_on_Vapour_Migration.pdf
Site specific RA for soil and GW (analytical model – backward mode)

- **C ≤ CSR_{model}?**
  - **yes**
  - Is it possible to carry out the soil gas survey?
    - yes
    - Soil Gas Survey
    - no
    - Other monitoring techn.
      - yes
      - «Lines of Evidence» approach
        - yes
        - C_{soil gas} ≤ C_{threshold}?
          - yes
          - Site specific exposure scenario
            - yes
            - Selection of the specific Attenuation Factor (alfa)
              - yes
              - RA from soil gas data (forward mode)
                - yes
                - Is the Risk acceptable?
                  - yes
                  - No action needed on the «volatile fraction»
                    - no
                    - End
                      - Monitoring
                        - no
                        - Action needed on the «volatile fraction»
                          - yes
                          - C_{target_soil gas} = C_{acceptable}
                            - yes
                            - Excluding the Volatilization Pathway from the CSM
                              - no
                              - C_{target_soil gas} = C_{threshold}
                                - yes
                                - Monitoring
                                  - no
                                  - End
Site status 1: sites where polluting activities took/are taking place.

Site status 2: sites in need of investigation/still to be investigated or under investigation where there is a clear suspicion of contamination.

Site status 3: sites that have been investigated, but no remediation is needed (unless land-use changes, i.e. in application of the principle of fit for current use).
Site status 4: *sites that need or might need remediation or risk-reduction measures (RRM)*, including natural attenuation

Site status 5: *sites under/with ongoing remediation or RRM*

Site status 6: *site remediated or RRM completed or sites under aftercare measures*

Ferrara (Italy) - **18-20 September 2019** – SAVE THE DATE

Abstract submission by **30 May 2019** – **free of charge** – **2 dinners** offered

Shuttle from Bologna Airport (it takes 35 min)

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https://youtu.be/UCxAW5YWopw
Thank you for your attention!!!
Obrigado!!!
Gratias!!!

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