EXPERIENCES FROM PROFESSIONAL GEOLOGICAL SUPERVISION ON REMEDIATION OF SITE QUARRY SRDCE

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Introduction

On the site quarry Srdce has been made one of the first professional geological supervision (PGS) as part of remediation program for the contaminated sites in Slovakia. PGS was realized according to the requirements of the Act 569/2007 Z.z. on geological Works.

The remediation itself consisted of removing contaminated material – "gudron" (sludge, organic acid petroleum residual products) from environment and revitalized the quarry. The purpose of remediation activities was eliminating human and environmental risks resulting from possible exposures of contaminants by spreading them to the ambient environment (Fig. 1).

Activities of PGS

One of main task for PGS activities was to ensure that remedial work has been carried out in good quality, effective, in accordance with the acceptation of the project, according to the approved schedule and the approved budget. At the same time it was necessary overseeing the implementation of remediation for compliance with applicable laws, regulations and standards.

Individual activities PGS were designed so as to meet the objective of geological problems – completely removing storage of gudron from the quarry. Methodology for PGS activities considered all results from previous geological survey and risk assessment with respect to physical-chemical properties of hazardous waste deposited in a quarry, difficulties of terrain and the condition of the quarry.

The key activities of PGS:
- Monitoring the effectiveness of the funds spent in relation to the desired outcome of the project,
- Evaluating of remediation work development,
- Providing of feedback for timely detection of problems,
- Preparation of proposals for corrective action.

Additional activities of PGS:
- Control over implementation for required range of remediation activities set upped by the project,
- Verification of documentation and data sets,
- Verifying of achieved remediation limits.
Activities of PGS were also oriented to check the effectiveness and accuracy of the remediation by field measurements, sampling and laboratory analyzes throughout the period of remediation (Fig. 2.1 – Fig. 2.3).

Results and conclusion

The locality was remediated in accordance with the approved project. The total excavating amount of hazardous waste (acid tars and contaminated soil) was 18 400 m³ of acid tars and 14 150 m³ of contaminated soils including cover layers. In handling hazardous waste, it was preceded in accordance with applicable legal regulations.

To demonstrate fulfilling of remediation limits relatively dense network of sampling places was necessary to applied. Despite the highly heterogeneous nature of soil on the bottom of quarry it has been shown that the residual soil material at the quarry bottom is clean. Control of groundwater sampling was considerably limited. On most of objects the groundwater was not reached. Sampling was possible realized only in one monitoring well and then also in older objects situated further away from landfill. Due to this situation it was use the opportunity of additional occasional sampling of surface water, which originated from rainfall on the surface of gudron.

A challenge in the implementation of remediation works was removing of waste material from the quarry walls and crevasses. For these purposes were applied various technics: excavator, hand treatment, hydraulic purification, and best-applied application of special air blasting with addition of sand as an abrasive. The final clean up works were controlling primarily sensorially in-situ. It was observed the presence gudron on the surface of each key sector: the quarry walls, surface of the quarry bottom, driveway, handling areas. Within backfilling the quarry it was necessary to record the "purity" of the imported soil material for recultivation of quarry to prevent unwanted contamination. The frequency and extent of sampling adapted to the operational state of filling the quarry with clean soil: weather, days off, the availability of soil, etc.

Sequence, management and coordination by the PGS in the course of all geological and remediation work at the site was carried out in collaboration with the contractor and customer (Ministry of Environment of SR). In addition to participation in control days, was the presence of PGS on the site depending also on the progress of remediation works. This part is very important to achieve remediation goals. It is necessary to participate on ongoing activities directly from beginning only that way is possible to ensure effective approach for remediation.

LITERATURE
