

# AREA DECONTAMINATION FOR FUTURE INDUSTRIAL ZONE IN MOŠNOV

## SANACE ÚZEMÍ PRO BUDOUCÍ PRŮMYSLOVOU ZÓNU MOŠNOV

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### Abstract

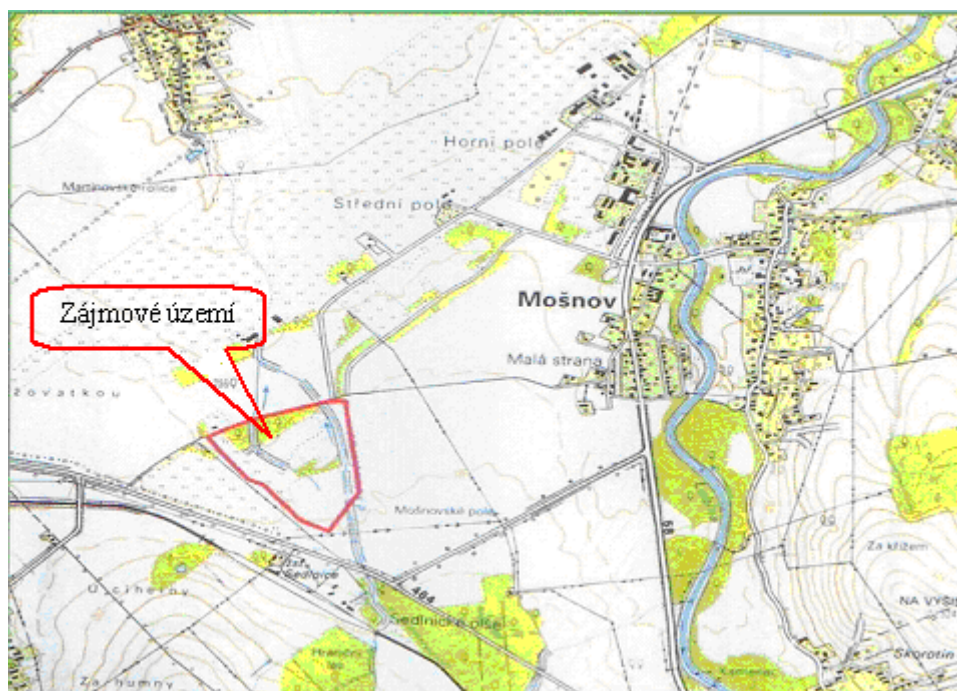
Changes occurring in the Industrial Zone in Mošnov, which rest in the preparation of sites suitable for the development of industries, have been slowed down; among others, due to the remains of the operation of the civil and military airport in the past. One of many types of work executed there rests in the decontamination of some parts of the site, old and abandoned facilities serving for the airport operation, utilities and an underground wall. The total area is 26.6 hectares.

### Abstrakt

Zde jsou uvedeny změny probíhající v průmyslové zóně v Mošnově, které spočívají v přípravě území vhodného pro rozvoj průmyslových odvětví; mimo jiné kvůli pozůstatkům dřívějšího provozování civilního a vojenského letiště. Jeden z mnoha druhů prací zde prováděných spočívá v sanaci některých částí území, starých a opuštěných technických prostředků sloužících provozu letiště, inženýrských sítí a základových zdí. Celková plocha je 26,6 hektarů.

**Key words:** decontamination, Industrial Zone, Mošnov Airport, area contamination

## 1 INTRODUCTION



**Fig. 1** Industrial zone in Mošnov

The site decontamination in progress covers the former fuel storage. The contamination of the area was caused by oil and oil products leaking into the subsoil throughout a long-time operation of the fuel filling station.

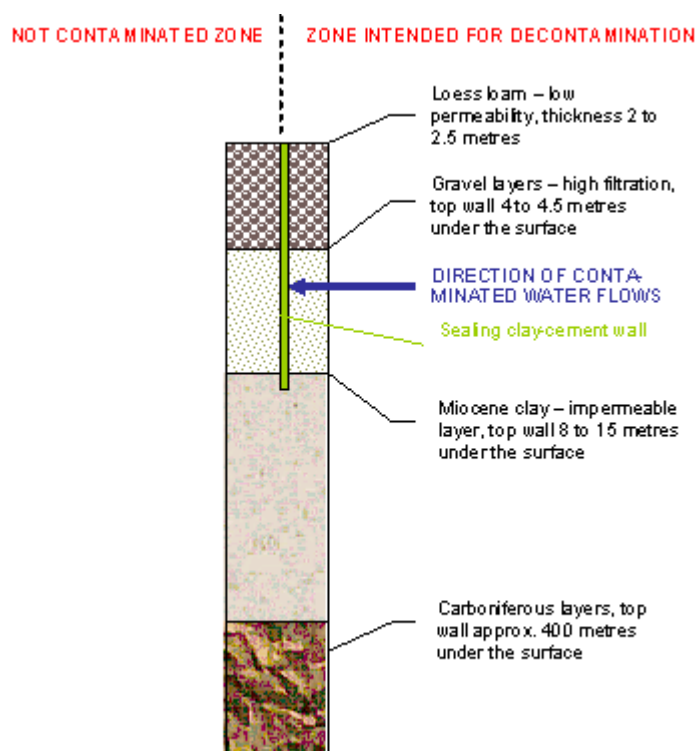
The decontamination project was commenced in December 2008 and its completion is expected in June 2009, with subsequent ground water monitoring.

A subject matter of the decontamination project (an extract from the contract concluded): *"The Contractor undertakes to execute the decontamination works and remove facilities (constructions) in the Industrial Zone in Mošnov – the site of the former fuel storage, including the preparation of the implementation project documentation..."*

## 2 DECONTAMINATION PROJECT AIMS AT RECOVERY OF GROUNDWATER FLOWS

From geological point of view, in the past, the site situated in the concerned location made it possible to build a sealing wall preventing the oil and oil products leakage into the Albrechtický Creek and the surrounding area (see the attached figure).

The bedrock consists of the lower Carboniferous layers ending approx. 400 m under the surface; next layers are formed by the shallow sea sediments from the era of Tertiary sea dereliction – Miocene sandy clays. The top ceiling of the Miocene clays is situated 7 to 14 metres under the surface. Those Neogenous sediments are formed by sandy clays and calcareous clays which, from the petrographic point of view, are almost impermeable and form a natural insulation layer. That is the depth where the bentonite sealing wall was embedded in the late 70s of the last century (see the figure). It is then followed by the Quaternary capping with an average height of approx. 10 m, formed by the deposits of the Odra and Lubina rivers and other tributaries. The verified height of fluvial sediments ranging from 4 to 5.5 metres forms a vast water accumulation. The uppermost part of the Quaternary capping (2 to 3.5 metres) consists of loess loam preventing the precipitation leakage into lower layers.



**Fig. 2** Site characteristics

The method of execution resulted from geological research findings, archive documents and knowledge of designers of buildings in the given location who are still alive. Another important factor for the formulation of technology for the project implementation was a previous removal of military bunkers and their mutual interconnections. The environmental breakdown during the liquidation of the mentioned army structures proved a previous weak securing of fuel distribution systems which were put out of operation before. Therefore, it could be assumed that the situation at the construction site would be much more complicated than assumed by the designer.

In the time of the construction site take-over, the contractor of the decontamination project had

to manage undergoing clean-up activities aiming at removing the impacts of oil breakdown occurring during the previous demolition.

### 3 PROGRESS OF DECONTAMINATION INTERVENTION BY MARCH 2009

The structures needed in the past for the operation of the propellant decantation were removed from the surface of the site concerned. The demolition material was continuously sampled and assorted according to the waste catalogue classes. A part of the demolition debris was transported to the decontamination sites in Studénka and Bohumín for the follow-up decontamination. Similarly, soils extracted during the demolition works are monitored and transported for decontamination or to determined sites, as well as debris for further utilization.

Rainwater is drained into infiltration bores inside the concerned site and overflows directly into the decontamination station. Water from the monitoring bores is pumped into two stationary decontamination stations. After the purification from oil products, clean water is discharged into the Albrechtický Creek.

#### 3.1 Description of water decontamination

1. pumping of surface and absorbed polluted water from the redeveloped site,
2. gravitation settling of suspended particles in a settling tank,
3. gravitation separation and sorption of NEL type substances in the settling tank with the sorbents filling,
4. striping of volatile organic substances (BTEX) in aerators,
5. cleaning of air by means of filters filled with active coal.

A significant amount of oil substances left in the abolished parts of the underground technologies was found during the removal of the pipeline. In the course of the demolition works those oil substances are pumped and transported by tank trucks to the following disposal. Since the cleaning of the piping connecting the individual parts of the technology unit was done in the past, the project documentation did not expect oil substances in such an extensive volume.

Likewise the current knowledge indicates a further essential change in the structure of a clay-cement diaphragm wall. The current hardness tests indicate that the concrete of very good parameters was used for the construction of the diaphragm wall in the past. Therefore, we should count with higher costs on its opening for the recovery of water flows, as well as with a longer period of time for its demolition.

After the project is completed, the removal of the underground propellant distribution system in the length of approx. 1200 meters will still be needed, as well as of parts of its load-bearing structures and for decontamination purposes - the extraction of approx. 5000 cubic meters of soil. All that in parallel with the decontamination of intake water. The replenishment of excavated soils in pursuance of the soil decontamination and landscape modifications will follow. The final phase will be the opening of the diaphragm wall and thereby the restoration of original underground water flows.

### 4 CONCLUSIONS

The implementation of the reclamation (clean-up) projects is based on survey, which do not sufficiently depict the character of the territory contamination. The problem consists in the preparation of individual reclamations where the survey is significantly limited from the financial point of view. We often encounter situations that companies implementing the reclamation projects point out that there is a lack of information about the territory. The resulting situation is subsequently resolved by a so-called "additional reclamation survey" and subsequent approval of the implementation project by the reclamation ordering party. It actually means re-working a part of the project and the related budget. When the performer of reclamation establishes prices of the reclamation works "on site" he has to base it not only on his experience with a similar project but above all, when he is getting familiar with the prepared specification documentation, take into consideration the fact that a supporting documentation was used for the specification documentation.

#### REFERENCES

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### RESUMÉ

Článek popisuje postup sanačních prací v území bývalého stáčiště pohonných hmot v lokalitě Letiště Leoše Janáčka v Mošnově. Cílem článku je seznámení čtenáře s postupem budování průmyslové zóny v Mošnově a problematikou, se kterou se setkávají realizatoři zadávací dokumentace a realizatoři sanačních prací na obdobných zakázkách. Z článku je patrné, že investor věnuje dostatečnou pozornost ekologické stránce a vynakládá značné finanční prostředky na sanační zásahy ještě před poskytnutím ploch pro novou průmyslovou zástavbu.