



Land Protection Group conducts scientific and didactic activity in the field of land protection as well as integrated environment protection, is a part of **the Chair of Environment Protection and Management** in the Warsaw University of Technology, lead by prof. Marek Nawalany, D.Sc., Ph.D., Eng. The chair conducts multidisciplinary scientific investigations and research & development works, including basic components of the environment and processes proceeding in them, with particular reference to human impact on the environment as well as methods and technology preventing or minimizing negative influence of civilization's development on the environment. Main directions of the research developed in the Chair are: meteorology and atmosphere protection, hydrology, water management and water protection as well as land protection, waste management and integrated environmental protection. The chair cooperates with governmental units, industry, public organizations as well as national and foreign universities.

### Team of researchers:

#### Head of the Group:

- Prof. Andrzej Kulig, D.Sc, Ph.D., Eng.

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### Research Laboratory of Soil Contamination

#### Head of the Laboratory:

**Agnieszka Pusz, Ph.D., Eng.**

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### Equipment and apparatus:

- soil drills
- calibrated sieves
- calcimeter
- filtration apparatus
- flame photometer
- sapatmat
- spectrophotometers
- conductometers and pehameters
- portable gas chromatograph
- air sampler
- field olfactometers
- sonometer

### Scope of analyses:

- soil samples collection
- soil fractional composition
- filtration factor
- pH
- salinity
- carbonates
- sulphates
- chlorides
- organic carbon
- properties of sorption complex
- digestible forms of nutrients (N, P, K)
- sodium, potassium, calcium, lithium
- metals: iron, manganese, cadmium, lead, copper, zinc, chromium, arsenic, nickel
- organic compounds, including petroleum hydrocarbons
- odour concentrations

### Cooperation with:



AGH, Faculty of Mining Surveying and Environmental Engineering – Department of Management and Protection of Environment



Opole University, Faculty of Natural Sciences and Technology



Olfactometric Laboratory of the Politecnico di Milano



CELSA Huta Ostrowiec in Ostrowiec Świętokrzyski



Bolimów Landscape Park



Wrocław University of Technology, Institute of Environmental Engineering



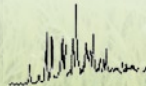
The Society of Ecological Chemistry and Engineering



Otto Engineering



Water Supply And Sewerage Company in Warsaw Joint Stock Company



Laboratory of Environmental Chemistry s.c.



### Meteorology Group

### Air Pollution Control Group

### Land Protection Group

### Water Management and Hydrology Group

### Waste Management Group



Faculty of Environmental Engineering  
Warsaw University of Technology  
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### Land protection:

- research of soil, ground and ground waters purity's degree – environmental audits of land
- determination of land contamination causes
- assessment of ground purification needs
- conceptions and projects of degraded land reclamation
- soil and ground purification methods
- monitoring and assessment of effects (effectiveness) of reclamation fieldworks



### Integrated protection of environment:

- environmental impact assessments of municipal, industrial and infrastructural ventures
- environmental assessments of existing objects, including ecological audit of installations
- research and monitoring of environment (i.e. chemical impurities, odours emission and olfactory nuisance, as well as acoustic influence)
- methods of environmental impact control
- legal protection of environment
- permissions for emission

### Scientific and research studies (in Polish):

Kulig A., Kaczyńska A. K. (2011): Parametrization of the purification process of petroleum drilling waste fluid disposal.

Pusz A. (2011): Analysis of usefulness of materials (soil and aggregates) for reclamation of industrial landfill site.

Kulig A., Lelicińska-Serafin K., Podedworna J., Sinicyn G., Heidrich Zb., Czyżkowski B. (2010): Detailed identification, inventory and characterization of odorant sources in the municipal services.

Pusz A. (2009): Effect of reclamation treatments on changes in ground's physical and chemical properties in the surroundings of municipal landfill environment.

Grabińska-Łoniewska A., Kulig A., Pajor E., Skalmowski A., Rzemek W., Szytak-Szydłowski M. (2007): Migration of potentially pathogenic microorganisms and chemical impurities in landfill leachates in certain ground-water conditions.

Kulig A., Czyżkowski B., Dmochowski D., Miałkiewicz-Pęska E., Ossowska-Cypryk K., Sinicyn G., Rzemek W., Sternicka-Kantor M., Dąbrowska M. (2007): Examination of environmental impact of Wastewater Treatment Plant „Potudnie” in Warsaw.

### Research-implementation works and EIA reports (in Polish):

Kulig A., Pusz A., Sternicka-Kantor M. (2011): Examinations of trichloroethene and tetrachloroethene concentration in the groundwater in the region of intakes Celsa „Huta Ostrowiec” Ltd (for Celsa „Huta Ostrowiec” Ltd in Ostrowiec Świętokrzyski)

Kulig A., Zwoździak J., Szklarczyk M., Sówka I. (2011): Proposal for methodology to evaluate the odor-active substances content in the air (for the Ministry of Environment).

Kulig A., Szytak-Szydłowski M., Pusz A., Barczak R. (2011): Odor impact assessment of Technical and Holding Station Kabaty in Warsaw (for Mining Works Company „Metro” Ltd).

Kulig A., Szytak-Szydłowski M., Miałkiewicz-Pęska E., Barczak R., Sternicka-Kantor M., Dąbrowska M. (2010): Examination and evaluation of the environmental impact of Wastewater Treatment Plant „Czajka” in Warsaw (for Warsaw MPWIK S.A.).

Kulig A., Gołda T., Wójcik J., Pusz A., Szytak-Szydłowski M., Sternicka-Kantor M., Dmochowski D., Dąbrowska M. (2010): Project of reclamation of the former Industrial Landfill in Krzemionki Opatowskie (for Huta Ostrowiec Ltd in bankruptcy in Ostrowiec Świętokrzyski).

### Subjects realized for the field of the study:

#### Environmental Engineering:

- Soil Protection (in English and Polish)
- Irrigation and Drainage (in English and Polish)
- Land Reclamation and Development (in English)
- Degraded Land Reclamation (in Polish)
- Environmental Impact Assessment (in English and Polish)
- Environmental Impact Assessment of Municipal Facilities (in Polish)
- Pedology (in Polish)

#### Environmental Protection (in Polish):

- Pedology
- Land Reclamation and Development
- Legislation in Environmental Protection
- Environmental Impact Assessment
- Soil Quality Assessment Techniques
- Soil Remediation

#### Biotechnology (The Faculty of Chemistry):

- Systems of Anthropogenic Pollutions Removal (in Polish)
- Ecological and Social Aspects of Biotechnology (in Polish and English)

#### Examples of diploma theses (in Polish):

„Phytoremediation as a method for purification of metal contaminated soils” (B.A.)

„Inventory, identification and characteristic of odor sources in Poland” (B.A.)

„Concept of the principles of design, exploitation and reclamation of asbestos-containing landfill” (Eng.)

„Analysis of iron and macronutrients in differentiated profiles of forest soils in Rawka and Rokita river valleys in Bolimowski Park Krajobrazowy” (M.Sc.)

„Analysis of causes and consequences for offences against the environment, with particular reference to issues of soil protection and waste management” (M.Sc.)

„Air pollutions in the surroundings of municipal landfills” (M.Sc.)