

About Land Protection Group

The Land Protection Group (LPG), conducting scientific and teaching activities in the field of land surface protection and integrated environmental protection, is part of the **Chair of Environment Protection and Management** of Warsaw University of Technology (WUT), headed by Prof. WUT Andrzej Kulig, D.Sc, Ph.D., Eng. The Chair conducts multidisciplinary scientific research and development work, covering the basic components of the environment and the processes taking place in it, with particular emphasis on human impact on the environment and methods and technologies preventing or minimizing the negative impact of civilization development on the natural environment. The basic research directions developed in the Chair are: meteorology, climate and air protection, hydrology, water management and water protection, as well as land protection, waste management and integrated environmental protection. The staff members of the Chair cooperate with state administrative units, industry, social organizations and national and foreign universities.

Group leader

■ **Prof. WUT Andrzej Kulig, D.Sc., Ph.D., Eng.**
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Team members:

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Staff members of the Land Protection Group in the laboratory – 2019

Land Protection Group for the economy

Laboratory of the Land Protection

Chief of the Laboratory:
Prof. WUT Agnieszka Pusz,
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Equipment and apparatus:

- soil augers
- manual core sampler
- penetrometer
- calibrated sieves
- calcimeter
- filtering apparatus
- Soxhlet apparatus
- flame photometer
- sapromat
- spectrophotometers
- conductivity meters and pH-meters
- portable multi-gas detectors
- air samplers
- field olfactometers
- cover-type flux chamber and wind tunnel
- vacuum chamber
- sonometer

Scope of performed analyses:

- sampling of soil, groundwater and air
- fractional composition of soils
- filtration rate
- pH (reaction)
- salinity
- carbonates
- sulphates
- chlorides
- organic carbon
- sorption complex properties
- assimilable nutrient forms (N, P, K)
- sodium, potassium, calcium, lithium
- metals: i.a. iron, manganese, cadmium, lead, copper, zinc, chromium, arsenic, nickel
- organic compounds, including petroleum derivatives
- hydrogen sulphide, ammonia, carbon dioxide, thiols, volatile organic compounds, methane
- odour concentrations

The LPG cooperate, among others, with:

- Wessling Polska Sp. z o.o. in Cracow
- Regional Directorate for Environmental Protection in Warsaw
- AGH University of Science and Technology, Faculty of Mining Geodesy and Environmental Engineering – Chair of Environmental Protection and Management
- Wrocław University of Technology, Institute of Engineering and Environmental Protection
- University of Opole, Faculty of Natural Sciences and Technology
- Politecnico di Milano, Olfactometric Laboratory
- Society of Chemistry and Ecological Engineering
- Municipal Water Supply and Sewerage Company in the Capital City of Warsaw
- Steelworks Celsa Ostrowiec in Ostrowiec Świętokrzyski
- Otto Engineering Polska S.A. in Rzeszów
- Landscape Park in Bolimów
- Laboratory of Environmental Chemistry

More information: www.opz.is.pw.edu.pl

Chair of Environment Protection and Management



Meteorology Group

Air Pollution Control Group

Land Protection Group

Water Management and Hydrology Group

Waste Management Group



Faculty of Building Services, Hydro and Environmental Engineering

WARSAW UNIVERSITY OF TECHNOLOGY

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Three basic areas of the scientific and research activities:

Soil protection:

- research on the degree of purity/pollution of the ground and water environment (soil, ground and groundwater) – environmental audits of the land for both undeveloped terrain and industrial/brownfield sites
- survey, evaluation and improvement of soil fertilising properties (NPK)
- determination of causes of soil contamination
- assessment of soil and ground cleaning needs
- remediation concept and plans
- methods of cleaning up the soil-water environment
- concepts and projects for the reclamation of degraded land
- monitoring and evaluation of the results (effectiveness) of remediation work



Protection against odours:

- identification of sources of odours in technological processes in municipal and industrial facilities
- odour management programme projects
- tests for the emission of odorants and odours
- evaluation of odour nuisance
- analysis of possibilities to reduce odour emissions and immissions

Integrated environmental protection:

- environmental impact assessment of municipal, industrial and infrastructural projects
- environmental assessments of existing facilities, including ecological audits of installations
- methods for reducing environmental impact
- environmental research and monitoring (e.g. chemical pollution, acoustic impact)
- legal protection of the environment

Scientific research studies and publications

- Wiśniewska M., Kulig A., Lelicińska-Serafin K. (2020) Odour Emissions of Municipal Waste Biogas Plants – Impact of Technological Factors, Air Temperature and Humidity.
- Pusz A., Wiśniewska M., Kamiński A. (2019) Research on metal mobility in contaminated soils (in Polish).
- Kulig A., Szyłak-Szydłowski M. (2019) Assessment of the Effects of Wastewater Treatment Plant Modernization by Means of the Field Olfactometry Method.
- Kamiński A., Pusz A., Wiśniewska M. (2019) Assessment of phytotoxicity of soils contaminated by oil substances (in Polish).
- Szyłak-Szydłowski M. (2018) Olfactometric method for assessing the degree of biostabilisation of waste in mechanical-biological processing installations (in Polish).
- Pusz A., Wiśniewska M., Rogalski D. i in. (2018) Identification of Threats to the Soil and Water Environment on the Example of an Inactive Landfill Site.
- Pusz A., Kulig A. (2014) Monitoring of trichloroethene and tetrachloroethene content in soil-water environment in third phase of ecological audit of land.
- Pusz A. (2013) Assessment of effectiveness of remediation methods for soil contaminated with metals for reclamation needs of industrial degraded land.
- Kulig A., Kaczyńska A. K. (2011): Parameterization of the treatment process of the oil well waste spill (in Polish).
- Pusz A. (2011): Analysis of suitability of materials (soils and aggregates) for reclamation of industrial waste landfills (in Polish).
- Kulig A., Lelicińska-Serafin K., Podedworna J., Sinicyn G., Heidrich Z., Czyżkowski B. (2010): Detailed identification, inventory and characterisation of odorant sources in the municipal economy (in Polish).
- Pusz A. (2009): Influence of remediation measures on changes in physical and chemical properties of the soil in the landfill environment (in Polish).
- Grabińska-Loniewska A., Kulig A., Pajor E., Skalmowski A., Rzemek W., Szyłak-Szydłowski M. (2007): Migration of potentially pathogenic microorganisms and chemical pollutants in leachate from municipal waste under specific soil and water conditions (in Polish).

Research and implementation work and EIA reports (in Polish):

- Pusz A. et al. (2019) Research and evaluation of ground environment pollution in the second stage of construction of the East-North section of the subway.
- Kulig A. et al. (2018) Identification, inventory and classification of potential sources of odour emissions in the north-western part of the Białystok city.
- Kulig A., Szyłak-Szydłowski M. (2018) Analysis of the validity of the use of masking preparations in order to reduce the odour nuisance on an ad hoc basis and indication of recognised test methods to assess the effectiveness of anti-odorous preparations (masking or neutralising).
- Kulig A., Szyłak-Szydłowski M. (2018) Ex-post analysis of the investment entitled "Modernization and extension of the sewage treatment plant in Pruszków" in terms of impact on selected environmental components.
- Kulig A., Szyłak-Szydłowski M. (2018) Opinion on the cumulative impact of the planned poultry farm and existing mink farms in Kawęczyn on human health and living conditions, with particular emphasis on odour effects.
- Pusz A. et al. (2017) Bioremediation of soil and water environment from petroleum products at PKN ORLEN S.A. Fuel Station.
- Kulig A., Szyłak-Szydłowski M. (2017) Identification of odour sources and characterisation of their participation in the problem of odour influence of Kronospan Mielec Sp. z o.o. plant to develop an odour management programme.
- Kulig A. et al. (2014) Ex-post analysis of investments located in the „Czajka” Plant in Warsaw, 4/6 Czajka st. in terms of their environmental impact.
- Kulig A., Pusz A., Sternicka-Kantor M. (2011): Investigations of trichloroethylene and tetrachloroethylene content in groundwater in the area of Celsa „Huta Ostrowiec” Sp. z o.o. intakes. (for Celsa „Huta Ostrowiec” Sp. z o.o. in Ostrowiec Świętokrzyski).
- Kulig A., Zwoździak J., Szklarczyk M., Sówka I. (2011): Proposal for a methodology for assessing the content of fragrance active substances in the air (for the Ministry of the Environment).
- Kulig A., Szyłak-Szydłowski M., Pusz A., Barczak R. (2011): Assessment of the odour impact of the Kabaty Technical and Storage Station in Warsaw (for Przedsiębiorstwo Robót Górniczych „Metro” Sp. z o.o.).
- Kulig A., Golda T., Wójcik J., Pusz A. (2010): Project of reclamation of the area of the former Industrial Waste Landfill in Krzemionki Opatowskie (for Huta Ostrowiec S.A. in Ostrowiec Świętokrzyski).
- Kulig A., Czyżkowski B., Dmochowski D., Miałkiewicz-Pęska E., Ossowska-Cypryk K., Sinicyn G., Rzemek W., Sternicka-Kantor M., Dąbrowska M. (2007): Environmental impact study of the „Południe” Wastewater Treatment Plant in Warsaw (in Polish).

Courses are available in the following fields of study:

Environmental Engineering (in Polish/English):

- Soil protection (in Polish/English)
- Irrigation and drainage (in Polish/English)
- Land reclamation and development (in Polish/English)
- Environmental impact assessments (in Polish/English)
- Environmental impact assessments of municipal objects (in Polish)
- Methods for assessing the degree of nuisance of waste management facilities (in Polish)
- Technology and design of soil cleaning and reclamation of degraded land (in Polish)
- Principles of soil diagnostic techniques (in English)

Environmental Protection (in Polish):

- Soil science
- Land reclamation and development
- Legislation in environmental protection
- Environmental impact assessments
- Techniques for diagnosing soil condition
- Soil and ground cleaning
- Analysis of spatial information
- Forecasts and techniques in environmental protection

Bioeconomy (in Polish):

- Soil protection
- Environmental impact assessments in bioeconomy
- Evaluation and reduction of odour nuisance in the bioeconomy
- Monitoring, remediation and reclamation of degraded areas

Examples of thesis topics:

- „Phytoremediation as a method of cleaning up metal-contaminated soils” (BSc)
- „Prevention of odorant emissions and prospects for development of deodorization methods in selected variants used in municipal wastewater treatment plants” (MSc)
- „Development of guidelines for the establishment of odour management plans for mechanical-biological waste treatment plants” (MSc)
- „Drip Irrigation System Design in a Semi-Arid Climate of Mildura, Victoria, Australia” (MSc)
- „Inventory, identification and characterization of odorant sources in Poland”. (BSc)
- „Concept of principles for the facilitation, operation and remediation of an asbestos landfill site” (BSc)
- „Analysis of iron and macroelements in diverse profiles of forest soils in the valleys of the Rawka and Rokita Rivers of the Bolimowski Landscape Park” (MSc)
- „Analysis of the causes and consequences of offences and environmental crimes, with particular emphasis on the issues of land protection and waste management” (MSc)