

Miranda Ptak PhD

**FACULTY OF GEOENGINEERING, MINING AND GEOLOGY
WROCLAW UNIVERSITY OF TECHNOLOGY
UL. NA GROBLI 15
50-421 WROCLAW**

SUMMARY OF PROFESSIONAL ACHIEVEMENTS

presenting a description of professional output and achievements
specified in particular in

Article 16 (2) of the Act of 14 March 2003 on scientific degrees
And scientific title and degrees as well as title
in the scope of art (that is Journal of Acts from 2017, item 1789)

**8 April 2019
Wrocław**

1. First name and surname

Miranda Ptak

2. Obtained diplomas, scientific degrees:

- **Master of Science in biology and environment protection:** I completed studies in biology and environment protection (long-cycle studies) at the Faculty of Life Sciences of the Szczecin University in 1995. I obtained my Master's Studies diploma on 5 June 1995.
- **Master of Law:** I graduated from the legal studies (long-cycle studies) at the Faculty of Law, Administration and Economy of the Wrocław University in 2009. I obtained my Master's Studies diploma on 8 June 2009.
- **PhD in technical sciences in mining and engineering geology,** granted via the resolution of the Council of the Faculty of Mining and Geoengineering at the University of Mining and Metallurgy in Cracow from 30 June 2011. Title of the doctoral dissertation: Method of assessment of the possibilities for conducting surface mining activities with an impact on Natura 2000 areas. The promoter of the doctorate was Associate Professor Zbigniew Kasztelewicz Eng. PhD. University of Mining and Metallurgy in Cracow while the reviewers were - Prof Wiesław Kozioł, Eng. PhD. (University of Mining and Metallurgy in Cracow), Jerzy Malewski, Eng. PhD (The Wrocław University of Technology).

3. Information concerning employment in scientific units

The Wrocław University of Technology, Faculty of Geoengineering, Mining and Geology, Section of Mining

- since 2017 the position of research-didactic adjunct
- from 2016 to 2017 the position of lecturer

University of Mining and Metallurgy in Cracow, Faculty of Mining and Geoengineering, Chair of Surface Mining

- since 2012 - under commission-based employment in the position of lecturer of post-graduate study - Surface mining

Copper Belt Technical College in Lubin

- from 2013 to 2015 in the position of lecturer.

4. Indication of achievement stemming from Article 16 (2) of the Act of 14 March 2003 regarding scientific degrees and titles and degrees and title in the scope of art (consolidated text, Journal of Acts from 2017, item 1789)

a) I am presenting my original monograph as a scientific achievement, written under the following title:

***POLISH OPENCAST MINING
LEGAL AND ENVIRONMENTAL CONDITIONS
STATE - ANALYSIS - ASSESSMENT***

b) Publishing house, year, publishing reviewers, number of pages, literature, tables, figures, photographs, legal acts:

Publishing House: Publishing House of the Wrocław University of Technology

Year of publishing: 2019

Publishing reviewers:

- **Professor Zbigniew Kasztelewicz, Eng. PhD, University of Mining and Metallurgy in Cracow**
- **Professor Jan Kudełko, Eng. PhD. of the University**

Number of pages: 354
References: 201 items

Tables, figures, photographs:

- 34 thematic tables,
- 48 figures, including schemes of procedures,
- 55 photographs, including more than 50% taken by the author of the monograph

Legal acts: 150 legal acts, including:

- 51 Acts,
- 12 Acts of EU and international law,
- 87 implementing acts.

c) Review of the scientific objective of the above specified study and the obtained results including explanations as to their potential usage

Introduction

The monograph concerns legal and environmental determinants which determine the surface mining activity in Poland at each stage of the mining project life. The basic objective of the habilitation dissertation was to present in the possibly the most comprehensive manner the legal and environmental determinants which shape surface mining activities in Poland. Presentation in an aggregate, synthetic and comprehensive manner of legal and environmental conditions constituted a significant challenge, both on the scientific plane as well as in the framework of a confrontation of the suggested solutions with their practical application. Furthermore, indication of mutual relations between individual determinants, explanation of their impacts as well as their evaluation from the point of view of the possibilities of commencing or carrying out surface mining activities was a substantial purpose of the monograph. In my so far scientific pursuits, having obtained my doctoral degree in technical sciences, I focused my attention on the issues related to the surface mining, its impact on the environment and the conditions stemming from legal regulations perceived from the historical and modern perspective. The issues stemming from legal and environmental conditions determining the surface mining sector originate out of incomplete knowledge, multilevel nature of these issues, their mutual intermingling, interdisciplinarity and complexity. The approach presented in the monograph, integrated to the issues of legal and environmental determinants in the surface mining sector, has triggered the premises for a holistic elaboration of this subject matter, which might constitute the basis for a thorough preparation of a mining project for the entrepreneurs, scientific personnel, managers of the mining plants' operations as well as for the state and local administration. This will ultimately lead to an efficient realization of mining ventures. In order to maintain transparency and a certain methodical order, I have applied a division within the monograph into several parts. Definitions of concepts were introduced, general principles of proceeding in case of environment protection drawing on the issue of universality have been thoroughly discussed, general characteristics of the surface mining has been presented, legal determinants in the

mining-geological sector for the mining activity on its individual stages have been identified, issues related to the planning and spatial management in surface activities as well as environmental conditions stemming from the provisions of the EU and national law have been presented along with the characteristics of the legal institutions and the basic instruments in environment protection, such as assessments of the impact on the environment. I have sectioned off the topic of law as separate thematic parts of my work, whereby I discussed data on the environment, availability of environmental data bases, the system of fees stemming from the Geological and Mining Law of environment protection, including the structure and competencies of the organs of environment protection in Poland. The results of determinants depicted by me have been illustrated by means of numerous schemes, procedures and tables, constituting a result of the conducted synthetic analysis, the state of legislation in the scope of the analysed issue. Final parts of the monograph concerned environmental determinants in the aspect of actions towards minimizing the impact of surface exploitation on all the components of the environment and touched upon the issue of managing conflicts in the mining sector. The last component of the monograph was devoted to the role and importance of education in shaping legal and environmental conditions within the surface mining sector in Poland. **One of the basic objective s of the habilitation dissertation and a significant application component I have obtained while realizing my research objectives was the creation of the MODEL Lifeline of Mining Project - MINE-LIFE LINE**, the modules of which have been placed within the subsequent chapters. It constitutes a peculiar summary of the presented chapter and, ultimately, it launches a simple and practical, comprehensive model for defining legal and environmental determinants of surface mining activity in Poland, dedicated for each mining project.

No model has so far been created for the surface mining activity which would be placed within the perspective of legal and environmental determinants and yet, which would present the entire process - life cycle of a mining project. The above constitutes a substantial achievement of habilitation dissertation, since it provides an innovative solution and supplements the gap in this scope.

The scientific purpose of the work and the obtained results along with their potential use

The basis for the thesis of my work are the classified and characterized through presentation of the state, analysis and evaluation legal and environmental conditions of the multidimensional process being the surface mining activity. The fundamental scientific goal of my habilitation dissertation was thus to **prove the thesis that knowledge about legal and environmental determinants as well as the knowledge of their interpenetration within a defined mining-geological space, allows for a launch and optimal conduct of a surface**

mining activity at each stage of the mining project. The obtained scientific goal which stems from my monograph is a presentation and explanation how and which legal and environmental determinants impact the entire process of surface mining activity, at each stage of the mining project life, including the complexity of these processes and the fact of their mutual penetration. Throughout the course of realization of this objective I as adopted an assumption and elaborated a model based on four key areas (legal regulations, mining-geological conditions, spatial planning, environment protection in mining). While realizing a strive to present the most comprehensive data concerning the given legal institutions or environmental aspects, full specificity of such determinants was presented including their internal differentiation, level of their occurrence or the dynamics. One may note that all elaborations contained within my monograph were designated to present, enrich and organize knowledge about the essence and the functioning of the tested process of surface mining. The fact of elaborating an original and innovative model which might be particularly helpful in the scope of specifying legal and environmental determinants and one that is applicable for each mining project, deserves special attention. The model was called - Mining Project Life Line - MINE - LIFE LINE

The Mining Project Life Line - MINE-LIFE LINE as an application tool for specifying legal and environmental determinants of launching/conducting mining projects

The model of Mining Project Life Line - MINE-LIFE LINE allows in a swift and simple manner to conduct a characteristics of legal and environmental determinants, including their classification and establishing their critical values, with significance for launching mining projects, maintaining them and even changing, if necessary. The model MINE-LIFE LINE is featured by: simplicity, possibility of combined presentation of mutually penetrating one another conditions, transparency, communicativeness, possibility of direct display before a wider expert team as well as a guarantee of encompassing significant data and internal organization. At the same time, the model proposed by me may be expanded or modified depending on the needs and then, directly applied for all surface mining projects at each stage of their project life. Within my work I have presented a novel and original model - Mining Project Life Line - MINE-LIFE LINE, elaborated on the basis of the premises described in the monograph, consisting of seven basic modules. The analysis of legal and environmental determinants discussed within my dissertation found its application in the below presented model.

MINING PROJECT LIFE LINE - MINE-LIFE LINE

| 1. General characteristics: | | | | |
|------------------------------------|-------------------|--------------------|-----------------------|---------------|
| Mine/associated | Mining area in ha | Area of documented | Size of extraction in | Technology of |

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| | | | | |
|--|---|--|--|---|
| mineral | | deposit in ha | Mg | exploitation (i.e. MW under water) |
| 2. Spatial management planning documentation: | | | | |
| Case study of conditionings and directions of spatial management in the commune SUIKZPG | Local spatial management plan MPZP/MPZP for the mining area | | Decision establishing construction and area management conditions | |
| 3. Classification of venture according to EIA | | | | |
| I GROUP | II GROUP | I GROUP + NATURA 2000 | II GROUP + NATURA 2000 | OTHER |
| Cross-border proceedings | | Natural compensation | | |
| 4. Project documentation: | | | | |
| Geological documentation/ category of recognition | Hydrogeological documentation | PZZ deposit management project | Impact prognosis | Ecophysiological elaboration |
| 5. Concession and its conditions: | | | | |
| Size of extraction | Period of concession/ commencement term | Size of mining area in ha | Earth and rock masses | Mineral processing and other conditions |
| 6. Operating records: | | | | |
| Operating plan | Exploitation project | Safety document | Reclamation project | Ordinances Manager of Mining Plant Operations (KRZG) Rules |
| 7. Environment protection: | | | | |
| 7.1. EIA Report: | | | | |
| Mining area ↑ 25 ha, + processing | - peat, lacustrine chalk extraction - in flood areas - in forest areas or 100 m from such areas | - in areas covered by nature protection forms or in clearings - in areas with a distance not exceeding 250 m from areas of protection against noise | - activity with MW - if mining area of surface exploitation is located at a distance not exceeding 0.5 km | Mining area ↑ 2 ha and extraction ↑ 20 000 m ³ |
| Obligatory | Optionally | Optionally | Optionally | Optionally |
| 7.2. Requirements of environmental decision | | Planning stage | Exploitation stage | Liquidation stage |
| Spatial economy | | | | |
| Resource management | | | | |
| Quantitative restrictions | | | | |
| Time restrictions | | | | |
| Qualitative limits | | | | |
| Quantitative limits | | | | |
| Monitoring obligation | | | | |
| Reporting obligation | | | | |
| Ecological inspection | | | | |
| Other particular regimes | | | | |
| 7.3. Rational deposit management: | | | | |
| Ratio from concession: | | Documentation operative: | | Deposit settlement: |
| 7.4. Protection of earth surface: | | | | |
| Landslide hazard | Occurrence of troughs/earthfalls | Changes in area surface coverage | Damages to infrastructure/ access land works | Damages in high capacity buildings |
| 7.5. Land conservation: | | | | |
| Land excluded from agricultural production | Land excluded from forest production | Land transformed by mining activities | Volume of protected humus layer | Soil contamination |
| Reclamation decisions | Loss of usable value | Person obliged to reclaim | Direction of reclamation | Term of completion |

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| 7.6. Recultivation project: | | | | |
|---|--|--|--|--|
| | | Planning stage | Exploitation stage | Liquidation stage |
| Technical recultivation | | | | |
| Biological recultivation | | | | |
| Recultivation through recovering internal waste | | | | |
| Recultivation through recovering internal and other waste | | | | |
| Land use | | | | |
| Land revitalization | | | | |
| 7.7. Air protection: | | | | |
| Organized emission | Substances emitted and their acceptable levels | | Monitoring | Reports and fees |
| Emission allowance | | | | |
| Non-organized emission | Minimizing actions: - sparging - packaging - covers | | Monitoring | Reports and fees |
| | | | | |
| Emission from transport means | Quality of applied fuels and oils | Organisation of machines' working time | Technical state of machines and devices | Reports and fees |
| | | | | |
| 7.8 Protection against noise: | | | | |
| Presence of protected zones | Permitted levels from MPZP (Local Zoning Plans) | Identification of noise sources | Noise measurement | Minimizing actions: - covers - screens |
| | | | | |
| 7.9. Water and waste water protection: | | | | |
| Dry deposit | Water affected deposit | Exploitation outside of flood hazard zones | Exploitation in flood hazard zones | Dewatering system of the mining plant |
| | | | | |
| Water intake for the needs of the mining plant | Sewage disposal to the ground and to watercourses | Devices and installations | Processing with the use of mining plant waters | Impact mitigating actions |
| | | | | |
| Water Law permits | Adhering to quality and quantity standards of water and sewage | | Monitoring | Reports and fees |
| | | | | |
| 7.10. Waste management: | | | | |
| Extractive waste | | | Non-extractive waste | |
| PGOW (Programme of extractive waste management) | | | Permits for conducting activities in the scope of waste processing | |
| | | | | |
| Production | Gathering | Storage | Recycling | Disposal |
| | | | | |
| Permits/Approvals | Adhering to quality and quantity standards | | Monitoring | Reports and fees |
| | | | | |
| Earth and rock masses | | | | |
| MPZP (Local Zoning Plans) for the mining area | | Concession | Operating plan | |
| | | | | |
| 7.11. Protection of nature protection forms and areas covered by protection pursuant to specific legislation: | | | | |
| Area protection | | Species protection | Areas of other protection | |
| | | | | |

Each module of the MINE-LIFE LINE model may be further expanded. However, the results of the introduced replies already proposed within the model enable an evaluation of legal and environmental determinants of each surface mining venture. MINE-LIFE LINE model has been elaborated in a way revealed within the monograph which is somewhat enforced by the very nature of the process, that is the sequence of actions. This does not eliminate however selective actions, exclusive for the selected area, that is at the level, for instance, of the module of *environment protection*. In accordance with the hierarchy of

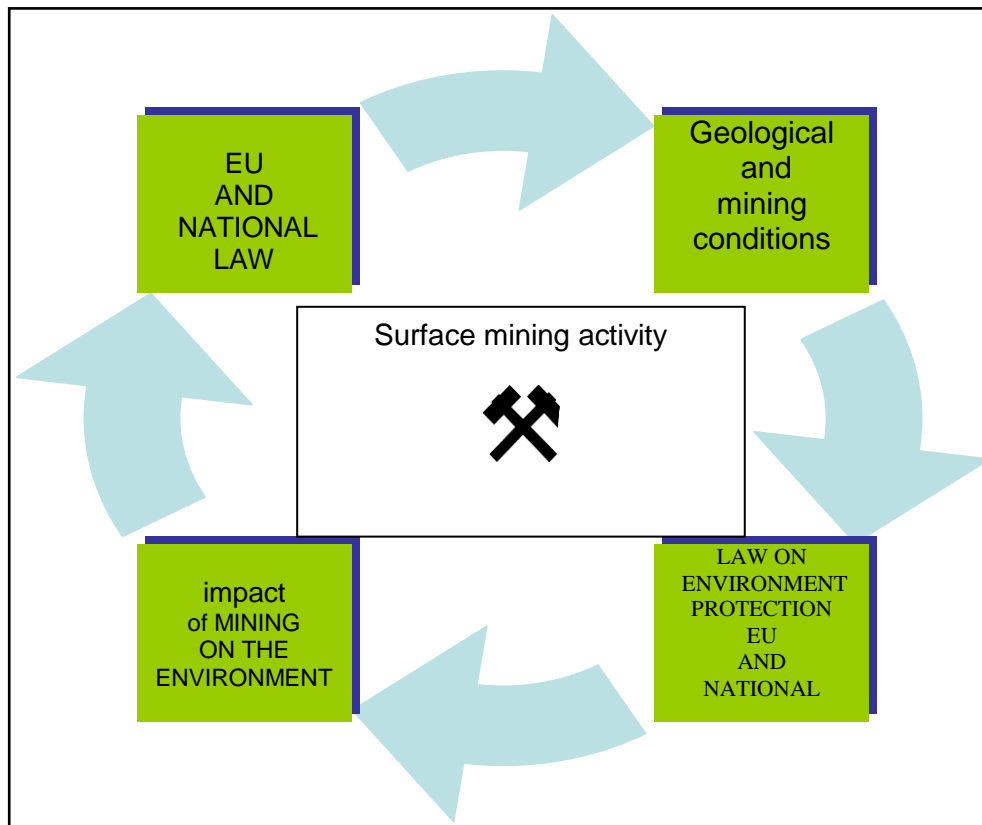
determinants, the most significant criterion was the fact of occurrence of the deposit itself. This has its reflection in the general characteristics, additionally supported by the data on the size of a given mining area, which imply further principles of proceeding. Subsequently, while building the model, I have carried out an analysis of other factors configuring and determining ventures we are dealing with in order to specify further requirements placed before them. Depending on the investigated situation, MINE-LIFE LINE model provides several possibilities of further proceeding. If the analysis of obtained data on the basis of essential information indicates that a given venture requires a report, then an analysis of data will be carried out subsequent to that with regards to environmental decisions. Within the remaining cases I have analysed it was also possible to come to the conclusion that there were no premises for conducting an evaluation of environmental impact (EIA)¹. Further arrangements in the scope of conditions stemming from SUIZPG will have a severe impact on the result ², MPZP³. From amongst further stages it is necessary to carry out verification of the requirements stemming from all types of documents indicated in the model at each stage of the mining activity. Within the elaboration, as a result of the analysis of legal and environmental determinants of MINE-LIFE LINE model actions related to geology and mining were presented as well as plans as to the planning processes of spatial planning and the whole seventh module concerning environment protection in the surface mining activity. In order to fully illustrate the complexity of analysed issues, I have identified the processes and stages, allowing through this for the preparation and, in consequence, implementation of proper actions based on the conducted right choices, stemming from the complete knowledge about the legal and environmental determinants. The model elaborated by me in the monograph, MINE-LIFE LINE, is a synthetic, compact approach of legal and environmental determinants presented and analysed in the work for the surface mining sector in Poland. I have embedded this model within four basic areas: legal regulations of the European Union and national law, geological and mining conditions, EU and national regulations in the area of environment protection, including spatial planning and evaluation procedures as well as the area devoted to the impact of surface mining on the environment. The below scheme presents the above specified areas as well as the significance of their mutual interrelations.

¹ EIA - environment impact assessment of a venture is a basic instrument in environment protection management. In the framework of the proceeding with regards to the environment impact assessment, for the planned venture:

- a) verification of the report on venture's impact on the environment is carried out
- b) opinions and arrangements required by law are obtained
- c) possibilities of participation of the society in the proceeding are ensured. Legal basis Article 3 (8) Act of 3 October 2008 on access to information on environment and its protection, participation of the society in environment protection and assessments of environmental impacts (Journal of Laws from 2018, item 2081).

² SUIKZPG - Case Study of determinants and directions of spatial management of the commune, stemming from the Act of 27 March 2003 on spatial planning and management (Journal of Laws of 2018, item 1945)

³ MPZP - Local Spatial Management Plan, act of local law which is generally binding, stemming from the Act of 27 March 2003 - on spatial planning and management (Journal of Laws of 2018, item 1945).



The practical-unitary goal and, at the same time, the conceptual goal which has been reached is a simple and convenient for application original and innovative model MINE-LIFE LINE, which may be applied for each planned mining venture, both in case of pilot ventures and ones already in place, allowing to specify the legal and environmental determinants in a swift manner. The use of MINE-LIFE LINE model allows to indicate the areas which will have a key meaning for the analysed situation without omitting the environmental aspects. An additional advantage is the possibility of its use by entrepreneurs, scientific workers, designers, KRZG (Mining Plant Operational Managers), administration personnel and the possibility of working on the selected modules. Furthermore, many elements of the habilitation dissertation, such as tabular overviews, schemes of procedures, models, descriptions of legal institutions or detailed indications of the rules of proceeding may find their practical use amongst a wide group of recipients. Familiarization with these research work results will allow the recipients to prepare and implement adequate actions in order to launch the mining project or optimize the already existing one. Guidelines and ready-made scenarios of actions may also find their significant use in solving conflict situations related to the mining activity. Within my work on application subject I have encompassed numerous critical remarks as well as rational suggestions of solutions in the scope of the legislation in place which might constitute an inspiration or a ready-made solution for improvement of the existing legal system.

Legal and environmental determinants for surface mining activity

While considering the issue of legal and environmental determinants of surface mining activity in Poland one must bear in mind the whole legal state of EU as well as national regulations presented in the monograph and, in the further order, geological-mining conditions as well as the nature and the strength of impact of the mining activity on environment. These issues are discussed in the monograph, allowing to present a certain image and indicate answers to numerous questions related to the surface mining sector in Poland. At present, no such comprehensive solution may be found in the subject literature, which would independently and directly constitute the basis for settling legal and environmental determinants of the surface mining activity and, importantly, which would do so at each stage of the mining project life. Individual themes discussed by certain authors in a selective manner do not cover the gap visible in this area of research. The elaborated monograph attempts to find a common denominator, presenting numerous models of procedures, tabular analyses, legal regulations and indicate the necessity to undertake actions necessary for a given stage of conducting the surface mining activity. Yet another premise contributing to undertaking this research goal of the work were the situations and in particular refusals to launch new mining projects, terminations of the already conducted mining projects, unbeneficial conditions for carrying out recultivations or realization of the mining venture liquidations. In addition, also the disputes and mining conflicts which stemmed from the lack of knowledge of legal and environmental determinants ought to be indicated. The research goal of the work covered surface mining in Poland, presenting in a thorough way the state of a given issue under elaboration, and subsequently an analysis was performed on the basis of which evaluation and conclusions were drawn up. Due to the fact that the elaboration covers in a comprehensive manner all legal and environmental determinants, it was necessary to present various aspects of surface mining activity. **Through this, due to realization of the main scientific goal which was to prove the thesis that knowledge about legal and environmental determinants as well as knowledge of their mutual penetration within a defined mining-geological space allows to launch and to optimally conduct surface mining activities, at each stage of the mining project, I have also obtained two scientific targets for the impact in the development of mining sciences, such as for instance:**

- characteristics of the system of legal regulations for the surface mining sector in Poland,
- elaboration of the requirements stemming from the provisions of law for entrepreneurs and mining plant operational managers in surface mining plants in the aspect of health and safety of work and environmental requirements,

- analysis of mining and environmental documentation necessary at each stage of the surface mining activity,
- elaboration of concession procedures for ministerial, marshal and starost concessions,
- elaboration of procedures for liquidations of mining plants for ministerial, marshal and starost concessions,
- elaboration of the procedure of approving the operating plan,
- elaboration of schemes of proceeding in the subject of the changes to the local spatial management plan for the mining projects,
- presentation of the assessment procedure for the mining projects, including cases of transnational impact, Natura 2000 areas, nature compensation,
- conduct of a review of all legal acts that have shaped surface mining activity environmental determinants in Poland (150 legal acts),
- conduct of review and analysis of the generally accessible databases, in the aspect of data on the environment,
- elaboration of a schematic diagram including specifying competencies of all environment protection organs in Poland, related to the surface mining activity,
- conduct of a review of the system of fees stemming from the Geological and Mining work as well as Environment Protection Law,
- defining the concept of a conflict in mining activity,
- conduct of review of the most frequently applied techniques in solving conflict situations with reference to their usefulness in the area of mining conflicts.

Within the habilitation dissertation, while performing a comprehensive analysis of legal and environmental determinants of the surface mining in Poland, on the basis of my knowledge, practice, literature analysis, foreign examples, I have on several occasions indicated the areas requiring changes. **Changes which would facilitate or tighten the legal system in many cases might put an end to the appearing conflicts. These detected areas of actions include:**

- standardization of procedures of environment impact assessment for surface mining,
- simplification and shortening of the assessment and planning procedures,
- spatial planning in the mining areas in the aspect of carrying out the conditions for concession and new investments in the area,
- hierarchy on protected areas, including areas protected outside of the act on nature protection,
- duration of validity of concession decisions for lignite,
- liquidation of the mining qualifications assigned by the entrepreneurs,

- process of liquidation with specifying the moment of liquidation, including payment of means gathered on the bank account,
- competencies or the bodies of mining supervision in the scope of construction objects located in the borders of the mining plant, specified by an entrepreneur,
- raw material policy and ranking of strategic, regional, local deposits,
- securing the occurring deposits,
- recycling of extractive waste as secondary raw materials, embedded in the principle of sustainable development and waste management in a closed circuit,
- recultivation processes and recovery in the mining excavations in the aspect of environmental impact,
- unused anthropogenic deposits.

Applied research methods

In the course of my studies I applied the most frequently such research methods as analysis, synthesis and deduction, as per individual stages of my work. Research methods such as observation, case study methods or statistical methods shaped the work to a lesser degree. Simultaneously, within the monograph I have at various stages of work applied a comparative method which uses and applies comparisons of legal acts from various perspectives. The issue of relationship between individual areas was of a significant importance for the realization of the basic research objectives which has found its reflection on several points within the publication. At the same time, realization of the assumed research objectives required the use of not only legislative sources, interpretations of the legal doctrine but also of the various literature sources and practical experiences. For this reason, an extensive researches were carried out based on the rich subject literature review, which on a number of occasions revealed inconsistent remarks and uneven conclusions concerning the analysed issues. Taking into consideration the environmental aspects, including the impact of surface mining activity, as to the assessment of the phenomena, I applied the method of individual cases and observation results, practices and field research. The analysis of processes occurring in the area of surface mining on the environment allowed to apply the generalization method and creation of the MODEL in the scope of environmental determinants - the seventh module of MINE-LIFE LINE model.

Structure of the monograph

Legal and environmental determinants comprise an interdisciplinary, multifaceted, complex and broad issue. They encompass the issues related to mining, its state of

development, technological processes, methods of exploitation as well as issues related to geology, including in particular in the scope of documenting the deposits of minerals, detection of conditions of their building up and estimating the possibilities of technical exploitation. In addition, apart from the raised, strict mining and geological issue, it was also necessary to perform an in-depth, inside out analysis of legal and environmental issues. The layer of analysed by me legal issues touches upon the formal-legal requirements, starting with planning an activity, through concession proceedings, to the issues of entity's legal responsibility. Whilst, the environmental layer has been outlined in my habilitaiton dissertation on two levels, as legal determinants and as environmental technical determinants concerning environment protection in the scope of the surface mining impact on all the components of the environment. Yet another, significant issue which has been portrayed in great detail by me concerned the topic of spatial planning and management, including the issues of securing the deposits of minerals and the spatial planning in the mining areas. As a subsequent, distinctive area of research analysed thematic block one must indicate the impact on environment, that is the whole spectrum of assumptions dedicated to the protection of environment at each stage of life of the mining project venture.

The structure of this elaboration covers in the first order (first chapter) the general characteristics of the surface mining, including indication of its diversity, scale of extraction and methods of exploitation. In this part of my work I have carried out a synthetic presentation of the state of affairs in the Polish surface mining sector. The subsequent chapter is devoted to the legal determinants of surface mining activities, whereby the system of legal regulation has been described in the introduction.

The entire chapter two was divided into five stages of the mining activity, which later on comprise an original, innovative model - Life Line of the Mining Project - MINE-LIFE LINE: STAGE I Search, detection and documenting deposits of minerals, STAGE II Concession proceedings, STAGE III Proceeding on approval of operating plan, STAGE IV Exploitation of the deposit, STAGE V Liquidation of the mining plant. The first stage of chapter two presents the principles of searching, detecting and documenting a deposit with the presentation of such issues as the right to geological information, mining use, geological documentation, deposit management project, mining area and terrain. In the second stage of the second chapter concessions procedures for the mining concessions, mines are presented constituting the mining property or property of land property. Within this part of the monograph, various types of concession were presented as well as the conditions for obtaining ministerial, marshal and starost types of concessions. The third stage of the second chapter contains a description of the procedure of approving the operating plan for the marshal and ministerial concession-based activity. This part of the chapter discusses also legal determinants for the conduct of mining plant operations without the operating plan

for the starost concession. Stage four is entirely devoted to the running of exploitation. Within this part of the second chapter, framework conditions for the conduct of mining works in the operations of the mining plant have been presented. At the same time, in the framework of presenting the legal requirements, basic obligations of the entrepreneur and the mining plant operational manager, all personnel working within the operating cycle of a mining plant were described and the operational documentation as characterized. This chapter was equipped, above all, also in the information regarding exploitation projects for the types of mining works specified by the provisions of law (i.e. Thermal mining). This stage of my work finishes with the issue of mining qualifications and competencies of the mining supervision. The last stage - the fifth stage of the second chapter, is devoted to the topic of liquidating the mining plant. The subject of this part of elaboration is the procedure of liquidation on the basis of the operating plan or on the basis of the concessions for the mining plants operating subject to the starost concession. In order to understand the essence of this legal institution I have presented the genesis as well as the technical and financial aspects of the mining plant liquidation.

Yet another area of my research is the third chapter which covers the entirety of the topic related to spatial planning. The title of this chapter - spatial planning and management and the surface mining activity. I have presented within this chapter, with significant attention to detail and thoroughness, the role played by spatial planning in mining investments. Proper identification of the correctness of undergoing planning processes may decide about the success of a given mining project realization, allowing also to present detailed procedures of conduct of abolishment of changes of the study of conditions and directions of spatial management of the commune and the local spatial management plan or detailed modes of introduction of the mining investment with the status of public objective upon the government task. I have presented in the work the hardly applied in practice mode of substitutive management of the voivode and I have analysed the competencies of the mining supervision in spatial planning of the mining areas. Within the subsequent chapter I have focused on the general principles of environment protection which comprise environmental conditionings for surface mining activities, including the overriding principles of sustainable development. In that fourth chapter I have created a defined network of concepts, based on the subject literature, as well as presented pursuant to the general principles of environment protection, the rules of universal perception of environmental regimes.

The fourth chapter contains also the presentation of the whole legal system of environment protection sensu largo with regards to the surface activities, the characteristics of individual acts including their precise analysis in the form of tabular summaries of environmental conditions for the surface mining activity. The general matters contain the procedures of assessment, that is: strategic assessment of environmental impact, standard

assessment of environmental impact, assessments of impact on Natura 2000 areas. Within this chapter I have encompassed the characteristics of proceeding in case of transnational impact, principles of natural compensation and the genesis of its occurrence. The chapter regarding general issues on environment protection served the function of presenting the idea of legal responsibility in environment protection and allowed to conduct a review of the available databases regarding the environment with an introduction of the issue of the right to information on the environment. One must underline that data on the environment may constitute the key moment in the occurrence of a mining conflict or create better conditions for carrying out the processes related to the surface mining activity. This chapter ends with a description of issues concerning competencies of individual administration organs, including the scheme and tabular summary of competencies of all environment protection organs in the scope of mining activities. Yet another issue discussed by me in the monograph is safety of deposits of minerals through a review and analysis of records of foreign and national raw material policies as well as signalling of the impact of the phenomenon of illegal exploitation on competitive conditions of conduct of the surface mining activity.

The fifth chapter contains an analysis I have carried out of the conditions of environment projection, each component of the environment in the aspect of the mining impact, indication of the sources of impact and a broad presentation of technical, technological and organizational assumptions minimizing these impacts. Within this part of elaboration I have presented both the good practices and the system principles of air, water, environment protection principles against noise, principle of protection of earth surfaces, protection of soils, principle of waste management, rules of sewage disposal as well as intentions designated to minimize the impact of blasting. In the scope of presented issues one might find the topics related to mining damages caused by the mining plant operations as well as the surface mining activity versus the protected areas.

Within chapter six I drew attention to the fact that legal and environmental determinants may constitute premises for conflicts in the area of mining ventures. This chapter presents the types of conflicts, the mechanism of conflict occurrence as well as some good practices in solving them. In the framework of this issue I have elaborated author's definition of a mining conflict and I have carried out an overview of the most frequently applied, effective techniques of solving conflicts in the context of mining activities. In the second to last chapter of the habilitation dissertation I presented the topic concerning the need to conduct changes in the system of school education in the scope of building understanding and social acceptance for the mining industry. This social license for the mining activity ought to be shaped from the youngest age. The monograph contains in this regard the list of good practices, including actions towards corporate social responsibility, as

well as a crucial clause stating that education realized on various levels must also take the form of popularizing messages in order to be effective.

I have included a summary in the last chapter of the work, applying for this purpose an original and innovative model MINE-LIFE LINE with special focus on realizing the thesis of my study and its purposes. Appendices in the form of practical list of legal acts, lists of abbreviations, list of drawings, figures and tables as well as references dedicated to this issue constitute an integral part of the monograph. In my opinion, careful selection of citations related to the presented problem commencing each chapter as well as photographs which constitute an attempt to illustrate an album of surface mining in Poland are crucial here.

Summary

Knowledge about legal and environmental determines surface mining activities in Poland. It has for years impacted the way all mining projects are realized. Nowadays, in the era of increasingly higher environmental standards and difficult mining-geological conditions, whilst at the same time upon the deficit of non-conflicting deposit areas, legal and environmental, as per their assessment, constitute next to economic factors the most important factor impacting decisions about the possibilities of occurrence of this type of venture.

Questions on how to obtain a mining concession for lignite? Who is entitled to geological information? How does the process of liquidation of a mining plant operating subject to the concession granted by a starost look like? Do the planning instruments secure the documented deposits in an effective way? Does spatial planning in the mining areas protect against buildings situated in the areas of impact of blast works? How does the legal system look like in case of the mining activity in Poland? Which mining project requires no environmental impact assessment? Which procedure is binding for the Natura 2000 areas? Who is responsible and for what in environment protection? Does waste recovery in the mining excavations require an operating plan? Which steps are taken by the mining plans targeted at limiting contamination? Why is surface mining an activity with a large risk of conflicts? These and other questions have been answered by my monograph entitled:

***POLISH OPENCAST MINING
LEGAL AND ENVIRONMENTAL CONDITIONS
STATE - ANALYSIS ASSESSMENT***

Within the monograph I attempted to present legal and environmental determinants occurring at each stage of surface mining activities in Poland in a coherent and

comprehensive manner. In order to realize this purpose I have presented the requirements placed by the provisions of law, including the EU, international and national law. A simple, original and innovative model of Life Line of a Mining Project - MINE-LIFE LINE, which allows for the conduct of a fast analysis based on logically set up modules, legal and environmental determinants in Poland for each mining project, was elaborated for the application use. The research material presented in such a way may aspire to a cross-sectional elaboration for the surface mining sector in Poland in the scope of procedures, legal and environmental determinants, including also issues related to environmental impact of mining. Numerous tables facilitate a synthetic and revision-like conduct of an assessment of legal and environmental determinants.

To sum up one might note that the complex nature of phenomena occurring in the course of entire multi-faceted and interdisciplinary process of the mining activity requires vast knowledge (in the scope of: mining, geology, environmental engineering, environment protection, law, health and safety of work, biology, spatial management) and knowledge of the processes in the scope of legal and environmental determinants in order to launch a mining project and manage them in an optimal manner. Research analysis within the monograph has revealed that there are areas requiring changes in order to facilitate individual processes. The possibility of applying original and innovative model MINE-LIFE LINE elaborated in the monograph allows in a pragmatic for each mining venture manner to present legal and environmental determinants at every stage of a mining project life.

I consider the most significant achievements of the presented study to include:

- elaboration of original and innovative model - Life Line of Mining Project MINE-LIFE LINE, ready for application for each mining project,
- comprehensive presentation of the state of legal determinants of the surface mining sector in Poland,
- comprehensive presentation of the state of environmental determinants of the surface mining sector in Poland,
- comprehensive analysis of legal and environmental determinants in Poland,
- assessment of legal and environmental determinants in the aspect of possessed experiences, good practices and world solutions,
- elaboration of author's concept of a set of legal acts, necessary for launching/conducting/liquidating a surface mining venture,
- synthetic characteristics of surface mining in Poland,
- elaboration of requirements stemming from the provisions of law for entrepreneurs and directions of operations of mining plants, surface mining plants in the aspect of health and safety of work and environmental requirements,

- conduct of analysis of the mining and environmental documentation, necessary at each stage of the surface mining activity,
- elaboration of concession procedures for ministerial, marshal and starost concessions,
- elaboration of procedures for liquidations of mining plants for ministerial, marshal and starost concessions,
- elaboration of the procedure of approving the operating plan,
- elaboration of schemes of proceeding in the subject of the changes to the local spatial management plan for the mining projects,
- presentation of assessment procedure for the mining projects, including in case of cross-border impact, Natura 2000 areas, natural compensation
- elaboration and conduct of the analysis of environmental requirements with regards to the surface mining activity in a tabular form,
- conduct of review and analysis of the generally accessible databases, in the aspect of data on the environment,
- elaboration of a schematic diagram including specifying competencies of all environment protection organs in Poland, related to the surface mining activity,
- conduct of a review of the system of fees stemming from the Geological and Mining work as well as Environment Protection Law,
- presentation of postulates for deposit protection,
- signalling the values of processes of raw material recovery, including the policy of closed-circuit economy,
- defining the concept of a conflict for the mining activity,
- conduct of a review of the most frequently applied techniques in solving conflicts with regards to their usefulness in the scope of mining conflicts,
- Signalling the role of education for legal and environmental determinants.

Taking into consideration the above results of research I presume that my monograph constitutes an impact into the development of mining sciences in the scope of determinants for the conduct of surface mining activities in Poland and, in particular, in the scope of legal and environmental requirements for same. In accordance with Article 16 (2) of the Act of 14 March 2003 on scientific degrees and scientific title as well as on degrees and titles in the scope of art (consolidated text Journal of Laws from 2017, item 1789) and thus, this achievement constitutes my scientific input into the development of the mining and engineering geology.

5. Presentation of other scientific-research achievements

After graduating from the Faculty of Life Sciences of the Szczecin University with the title of MSc. In Biology and Environment Protection I commenced work (1995) initially as a specialist on data analysis and information in the scope of environment protection at a company Centre of Ecological and Economic Information in Polkowice. In the framework of the assigned tasks I was involved in preparing reports on environmental impact, nature stocktaking and substitution investing for such ventures like: gasification of communes, construction of waste landfill Warta Bolesławiecka. Since 1997 I was professionally involved in cooperation with one of KGHM Polska Miedź S.A. Companies - AQUAKONRAD, where I continued to expand my interest in the areas of environment protection - being initially environment protection specialist and quality control specialist and subsequently - environment protection department manager. In 2003 I have commenced work in mining supervision as an inspector and I have been realizing this activity until now at the position of a deputy director of the District Mining Office in Wrocław. In the course of my law studies which I commenced in 2004 at the Faculty of Law, Administration and Economy of the Wrocław University, I also undertook doctoral studies at the Faculty of Mining and Geoengineering of the University of Mining and Metallurgy in Cracow in the Chair of Surface Mining (2008). While realizing research works during my doctoral studies I decided to apply my knowledge from the area of nature, environment protection and law. During that time, in the course of research works on the doctoral studies, I published a number of articles (18⁴), the subject matter of which was closely related to surface mining activities, impact of the mining activity on environment, including the possibility of mining works in environmentally protected areas such as Natura 2000 sites. Furthermore, I participated in several international and national conferences as an active speaker:

- English language XXI International Mining Congress in Kraków (August 2008)
- Conference Mining in Lower Silesia - past and present, The Wrocław University of Technology, Wrocław (December 2005)
- X Jubilee Mining Forum of Regular Mines, Wrocław (2006)
- VII Conference of Mineral Aggregates KRUSZMIN (April 2007)
- XI Conference MINING WORKSHOPS Ślesin near Konin (2007)

selected articles:

⁴ 1. Ptak M.: Tasks of environment protection in mining - past and present day. WUG Bezpieczeństwo pracy i ochrona środowiska w górnictwie, 5(141)2006;

2. Ptak M. : Network of Natura 2000 areas in the aspect of surface activities of the mining plants; Bezpieczeństwo pracy i ochrona środowiska w górnictwie WUG 6(154)/2007;

3. Ptak M.: *Natura 2000 and the principle of sustainable development in activities of mining plants within the Lower Silesian Voivodeship*; Materials presented at the VII Conference Mineral Aggregates KRUSZMIN, April 2007

4. Ptak M.: *Tasks related to the mining supervision in light of the new act on prevention of damages in the environment and their recovery in consideration of the issues concerning Natura 2000*. Bezpieczeństwo pracy i ochrona środowiska w górnictwie WUG 2(162)2008; ISSN 1505-0440

5. Ptak M.: The usefulness of selected scientific methods too solves the conflicts of face mining and regions Nature 2000. International Mining Congress Kraków August 2008

- XI Mining Forum of Regular Mines, Wrocław (2007)

In the framework of scientific-research works I participated in several projects concerning surface mining as their co-author and author.

- Carrying out an optimisation of access path for obtaining concession for lignite deposit "Legnica" with a description of the procedure of actions in the context of the provisions and spatial planning and management; team: Kasztelewicz Z., Uberman R., Ostreęga A., **Ptak M.**, (2008), AGH Foundation
- Determinants of construction of the new lignite mines in Poland, team: Kasztelewicz Z., Gawlik L., **Ptak M.**, Zajączkowski M (2008), AGH Foundation
- Extraction of lignite as an overriding public interest, team: Kasztelewicz Z., Gawlik L., **Ptak M.**, Zajączkowski M (2008), AGH Foundation
- The research project entitled "Conditions for managing perspective deposits of lignite on the example of the planned multi-pit mine Gubin-Mosty-Brody" for the Ministry of Science and Higher Education, under the supervision of Kasztelewicz Z., **Ptak M.** as the author of a chapter within this elaboration, entitled Assessment of environmental determinants of exploitation of Gubin-Mosty-Brody (2008 - 2011)
- Doctoral dissertation. "Method of assessment of the possibilities of conducting surface mining activities which impact the areas of Natura 2000" as a grant from the Ministry of Science and Higher Education **Ptak M.** (2009 - 2011),
- The opinion concerning classification of the work position of vulcanizer of conveyor belts on the surface in light of the binding provisions of the law establishing entitlements to the mining old age pensions and legal bases for the conduct of mining work by employees employed in entities performing activities entrusted to them in the operations of a mining plant as well as duties related to same, for AGH Foundation, Kasztelewicz Z., **Ptak M.** (2012)

At the same time, in the period from 2009 to 2016 I was employed in various scientific entities from the mining sector (Copper Belt Technical College in Lubin, University of Science and Technology in Kraków, The Wrocław University of Technology, Faculty of Geoengineering, Mining and Geology). Since 2016 I have been employed by the Wrocław University of Technology on the position of lecturer and since 2017, on the position of research-didactic adjunct at the Faculty of Geoengineering, Mining and Geology at the Department of Mining.

On 30 June 2011 I obtained my doctoral degree in technical sciences, within the field of mining and engineering geology. The method elaborated by me for the assessment of possibilities of carrying out surface mining activity has allowed to evaluate all deposits

located in the areas of Natura 2000. Application of method KZN2000/mAHP created by me confirmed the correctness of the assumed thesis about the possibility of elaborating a method of assessment confirming admissibility of surface activity in the conditions of Natura 2000 sites.

The scope of my scientific work and my research interests after obtaining my doctoral degree in technical sciences covered the following key issues:

1. The issue of national and EU legislation in mining and environment protection with special focus on:

- safety of raw materials in the country, power safety in the country, national raw material policy, deposit protection,
- analysis of legal institutions in the Act on Geological and Mining Law, Act on Environment Protection,
- historical mining.

The implementation of scientific studies in this field is the development of a number of articles, which are presented in **Table 1 Part 1** (below), as well as the organization and conduct of cyclic mining and geological workshops for poviata geologists. This research area was also carried out by coordinator and deputy project manager of the EU Program within **INTERREG Poland - Saxony 2014-2020 "Living with Mining"**, which partners are the Upper Saxon Mining Office in Freiberg, Marshal's Office of the Lower Silesia Voivodeship, Higher Mining Office in Katowice and the District Mining Office in Wrocław.

2. Issues of optimal design rules for opencast mines, with particular emphasis on:

- environmental conditions with simultaneous use of database spaces contained in GIS,
- optimal mine design with the use of computer software supporting this process, i.e. the development of the deposit model, mine model and optimal scheduling of operation,
- spatial planning in mining areas,
- modern techniques and technologies in mining,
- improvement of work safety in mining, wide recognition of natural hazards,
- innovative and intelligent solutions for mining.

The implementation of this area of scientific and research achievements is the development and presentation of industry articles, presented in detail in **Table 1 in Part 2**, as well as regular meetings with mining entrepreneurs and companies cooperating in the field of mining safety and natural hazards. Part of the research area was also implemented through active participation in the EU REMIX program - Intelligent and green mining regions of the

EU, where as part of demonstrating good practices, I co-organized a study visit of European partners in the field of modern technologies in the Magnezyty Grochów active mining plant and in the historic gold mine in Złoty Stok (2017).

3. Analysis of legal and environmental conditions, including:

- environmental conditions with special regard to protected areas,
- legal conditions for obtaining a concession for the recognition and documentation of deposits, including for brown coal,
- legal conditions for obtaining a concession for mining of deposits, including for brown coal,
- development of scenarios for the development of opencast mining, in particular the brown coal industry,
- procedures for environmental impact assessment,
- mining waste management, recovery, secondary raw materials, circular economy,

A summary of the scientific studies in this field is the development of procedures of conduct as regards provisions on spatial planning and development presented in the series of articles, and an accurate presentation of the brown coal mining industry, with particular regard to results in the design, construction and operation of exploitation in difficult conditions, as well as indication of results in the field of reclamation of post-mining areas, in a series of articles on the possibilities and purposefulness of mining and energy development based on this fuel. A summary of works on this research area is presented in **Table 1, Part 3**.

4. Issues related to the reclamation of post-mining areas of opencast mines, including:

- legal and environmental conditions for carrying out reclamation work,
- assessment of the foregoing results,
- a new approach to the principles of conducting reclamation works for obtaining acceptance for the development of opencast mining in Poland.

The summary of scientific studies in this field is presented in a series of publications on good practices, case studies, imitable as regards the subject of reclamation, which is shown in **Table 1, Part 4**.

5. Issues related to the liquidation and management of post-mining excavations in opencast mines, including:

- giving new quality to post-mining areas,
- legal problems related to the lack of entities responsible for liquidation,
- technical and economic conditions for liquidation of mining plants,

- conducting recovery and reclamation in the areas of liquidated mining plants.

The summary of scientific studies in this field is presented in a series of publications related to these issues, which is shown in detail in **Table 1, Part 5**.

6. Work safety in mining, including:

- investigation of the circumstances and causes of accidents,
- investigation of the circumstances and causes of the occurrence of hazardous events,
- safety at working site in mining,
- good practices in work safety in mining,
- the role of the human factor in accidents.

The summary of scientific studies in this field is presented in a series of publications related to these issues, which is shown in detail in **Table 1, Part 6**. This research area was also covered during workshops for entrepreneurs that I have been organizing and running regularly since 2012 with the Association of Mining Plant Traffic Managers.

Table 1. A set of selected articles in specific research areas, after obtaining a doctorate in technical sciences.

| No. | Author/authors | Work title | Publishing house, year of publication | Substantive share of the postdoctoral student |
|---|-----------------------------------|---|---|---|
| Part 1. Issues of national and EU legislation in mining and environmental protection | | | | |
| A | Ptak M. Kasztelewicz Z. | Important changes in the regulations on mining activities | Mineral aggregates T.2., Faculty of Geoengineering, Mining and Geology, Wrocław University of Technology 2018 | Presentation of the most important changes in the regulations shaping mining activities in the area of administrative proceedings, principles of licensing rights, and obligations of mining entrepreneurs. Signaling changes and characteristics of the effects of these changes in the area of legal and environmental conditions. I estimate my share at 80% |
| B | Ptak M. Kaźmierczak U. | Formal and legal regulations governing the award of concession contracts in Polish open pit mining | World Multidisciplinary Earth Sciences Symposium (WMESS 2018) | Development of the publication concept, preparation of materials for publication. Presentation of the concession system in Poland for opencast mining. I estimate my share at 50% |
| C | Ptak M. Podolski R. | Mining supervision activity in the MineLife – “Living with Mining” project of the European Interreg Poland-Saxony Program 2014-2020 | Work Safety and Environmental Protection in Mining, WUG, 2018, No. 8 | Characteristics of the EU INTERREG program, defining objectives and tasks. Presentation of the implementation of project events within the INTERREG program. I estimate my share at 90% |
| D | Ptak M. | Konzessionsverfahren im | Bergbau. 2018, Jg. 69, | Development of the |

Miranda Ptak: Summary of professional achievements

| No. | Author/authors | Work title | Publishing house, year of publication | Substantive share of the postdoctoral student |
|---|---|---|---|---|
| | Kaźmierczak W. Kaźmierczak U. | polnischen Bergbau | H. 11 | publication concept, introduction to the subject of Polish licensing rules, description of the concession institution as an administrative decision, the principle of licensing in Poland. I estimate my share at 50% |
| E | Ptak M. Kasztelewicz Z. | Protection of mineral deposits and State Raw Materials Policy | Institute for Mineral Resources and Energy, Polish Academy of Sciences, 2018, summary journal T.1 | Summary and analysis of raw materials policies of countries, presentation of problems in the field of raw materials policy. Formulation of the problem, examples of solutions, participation in the preparation of applications. I estimate my share at 80% |
| Part 2. Issues of optimal design principles for opencast mines | | | | |
| A | Ptak M. | Public databases used in the operations of the District Mining Office in Wrocław | Work Safety and Environmental Protection in Mining, WUG, 2014, No. 2 | My share 100% |
| B | Ptak M. Kasztelewicz Z. | How to start opencast mining activity - from the concession to the traffic plan | Mining review, 2014, No. 10 | Assumptions for the concept of publication, introduction to issues related to the concession, presentation of legal and environmental conditions, collection of materials, participation in the formulation of conclusions. I estimate my share at 70% |
| C | Ptak M. Paraszcuk K. | Protection of medicinal water sources in spatial development of mining areas | Work Safety and Environmental Protection in Mining, WUG, 2017, No. 3 | Assumptions for the concept of the article, introduction to issues of spatial planning in mining areas in the aspect of water protection. Conducting analysis on selected examples (Lower Silesia) I estimate my share at 80% |
| D | Ptak M. Filbier P. | Control and supervisory activities for rational deposit management | Opencast mining, 2013, No. 2 | The concept of publication, presentation of the role and tasks resulting from mining supervision regulations. Presentation of the most frequently observed irregularities in the field of rational deposit management. I estimate my share at 80% |
| Part 3. Analysis of legal and environmental conditions | | | | |
| A | Ptak M. , Kasztelewicz Z., Sikora M. | How to dot the i's and cross the t's - a government task as a formal and legal instrument in the procedure for obtaining a concession for brown coal mining | Brown coal - today and in the future: monograph, Agencja Wydawniczo-Poligraficzna Art - Tekst, 2018 | Development of a procedure for obtaining a mining concession in the scenario of a government task I estimate my share at 70% |
| B | Widera M, Kasztelewicz Z. Ptak M. | Lignite mining and electricity generation in Poland: The current state and future prospects | Energy Policy, 2016, vol. 92 | Creation of the concept of publication, preparation of source materials for publication, presentation of the current condition of the Polish brown coal mining I estimate my share at 45% |
| C | Ptak M. | Emission of pollutants to | Mining Science, 2016, | Assumptions for the concept |

| No. | Author/authors | Work title | Publishing house, year of publication | Substantive share of the postdoctoral student |
|--|--|---|--|---|
| | Merenda B. | atmospheric air in opencast mining activities | vol. 23 | of publication, presentation of sources and nature of emissions in opencast mining (rock mining), description of technological processes along with activities to minimize this impact, participation in the formulation of conclusions. Collection of source materials. I estimate my share at 80% |
| D | Kasztelewicz Z. Tajduś A. Cała M. Ptak M. Sikora M. | Strategic conditions for the future of brown coal mining in Poland | Energy Policy 2018, t. 21, z 4. | Creation of the concept of publication, preparation of source materials for publication, presentation of the current condition of the Polish brown coal mining I estimate my share at 30% |
| E | Ptak M. , Kasztelewicz Z., Sikora M. | Comparative analysis of power systems in Poland and Germany in the context of the use of brown coal resources | Scientific Journals of ISMIE, Polish Academy of Sciences, 2018, No. 104 | Participation in defining the concept of the article, collecting source and literature materials, presenting legal regulations, and participation in the formulation of conclusions I estimate my share at 40% |
| Part 4. Issues related to the reclamation of post-mining areas of opencast mines | | | | |
| A | Kasztelewicz Z. Zajączkowski M. Ptak M. Sikora M. | Directions of reclamation in Polish brown coal mines | In the materials of scientific and technical conferences issued by the Polish Consultants Association 2017 | Participation in defining the concept of the article, collecting source and literature materials, presenting legal regulations, and participation in the formulation of conclusions I estimate my share at 40% |
| B | Kasztelewicz Z. Ptak M. | Imitable examples in the field of reclamation and revitalization of post-mining areas in opencast mining | Mining review, 2012, No. 8 | Formulation of the research problem, preparation of source and literature materials and characteristics of legal regulations for reclamation and revitalization, participation in the formulation of conclusions. I estimate my share at 60% |
| C | Kasztelewicz Z. Ptak M. | Reclamation of post-mining areas in mines of rock raw materials | Scientific Works of the Mining Institute of the Wrocław University of Technology, Studies i Materials 2011, No. 39 | Presentation of the range of the issue, characteristics of the reclamation directions, and current changes in the scope of reclamation in the provisions of the Mining and Geological Law and executive acts. I estimate my share at 60% |
| Part 5. Issues related to the liquidation and management of post-mining excavations in opencast mines | | | | |
| A | Ptak M. Kasztelewicz Z. | Liquidation of the opencast mining plant | Mineral aggregates T.2., Faculty of Geoengineering, Mining and Geology, Wrocław University of Technology 2017, T.1 | Formulation of the research problem, preparation of source and literature materials, development of the procedure, participation in the formulation of conclusions. I estimate my share at 75% |
| B | Ptak M. Kasztelewicz Z. | The process of liquidation and reclamation in opencast mining plants versus the use of mining and non-mining waste as | Opencast mining, 2016, No. 1 | Formulation of the research problem, preparation of source and literature materials, development of the procedure, participation in the formulation |

| No. | Author/authors | Work title | Publishing house, year of publication | Substantive share of the postdoctoral student |
|--------------------------------------|---|---|---|---|
| | | well as anthropogenic raw materials | | of conclusions. I estimate my share at 75% |
| C | Ptak M. , Kasztelewicz Z., Sikora M. | The process of liquidation of the mining plant and protection of deposits | Scientific Journals of ISMIĘ, Polish Academy of Sciences, 2017, No. 100 | Formulation of the research problem, development of the liquidation procedure, participation in developing the proposed solutions I estimate my share at 60% |
| D | Ptak M. | Former quarries in Lower Silesia as today's tourist attraction | Work Safety and Environmental Protection in Mining, WUG, 2015, No. 9 | My share 100% |
| E | Ptak M. | Analysis of the regulations regarding the liquidation of a mining plant in the light of the new Act - Geological and Mining Law | Mining review, 2013, No. 3 | My share 100% |
| Part 6. Work safety in mining | | | | |
| A | Ptak M. | Evaluation of the human factor contribution in hazardous accidents and events in the mining industry in 2012-2014 | Materials of the 3rd Polish Mining Congress, 2015, Department of Geoengineering, Mining and Geology of the Wrocław University of Technology, | My share 100% |
| B | Ptak M. Kasztelewicz Z. | The most important changes in the amendment of the Geological and Mining Law | Mining Science 2015 Vol. 22 | The layout and concept of the article, the definition of the most important legal institutions that have been changed, in particular in the scope of the obligations of entrepreneurs and the Manager of Mining Plant in relation to work safety in mining I estimate my share at 75% |
| C | Ptak M. Podolska P. Podolski R. | Challenges for science: the exploitation of deep deposits | 18th Conference of PhD Students and Young Scientists Interdisciplinary Topics in Mining and Geology 2018, Web of Conferences, ISSN 2267-1242; vol. 71 | The concept of publication, presentation of the most important challenges in the area of work safety in mining and environmental protection, in particular waste and water management I estimate my share at 75% |

The scientific interests mentioned result from both my education and professional experience acquired when working in the mining plant operation and in mining supervision. Due to my knowledge (in the field of mining, geology, engineering and environmental protection, work safety, and law) and practice, I have the opportunity to initiate and participate in many interesting projects, researches, and mining projects.

The publication of 70 publications, (the total number - 89 publications) including 1 postdoctoral dissertation, 5 chapters in monographs, 2 chapters in books **is the summary of the scientific work after obtaining the doctoral degree**. In addition, I am a co-author of three publications listed in the Journal Citation Reports (JCR), with a combined IF index of

4.346. I am the author and co-author of 5 publications from the Philadelphia List, numerous articles and papers (56 from the list of Ministry of Science and Higher Education and 26 from Open Access), the detailed list of which presented in Annex 5 to the application for the conduct of habilitation proceedings.

6. Didactic activity

In the period after obtaining the doctoral degree, I conducted and still continue to conduct classes at full-time and part-time studies at the Faculty of Geoengineering, Mining and Geology, Wrocław University of Technology, field of studies: Mining and Geology, and Geodesy and Cartography. Since 2012, I have been conducting lectures as part of the postgraduate study - Opencast Mining at the AGH University of Science and Technology in Kraków. I also lectured at the Vocational Higher Vocational School of Copper Basin in Lubin. As part of didactic work, I prepared syllabuses of the conducted lectures and I participated in the development of curricula in the Commission at the Dean of the Faculty of Geoengineering, Mining and Geology, Wrocław University of Technology. I consider the execution of numerous engineering and master's theses under my supervision as a success in didactic work. The greatest teaching and educational achievement that I find very important, is giving possibility to both students and graduates of mining majors to participate in an internship under my supervision at the District Mining Office in Wrocław. I work with student government in the area of information about the range of interesting job offers for graduates. The detailed list of classes conducted by me is presented in Annex 5 to the application for the conduct of habilitation proceedings.

7. Achievements in the field of cooperation with institutions, organizations and scientific societies in Poland and abroad, and popularization of knowledge

I have achieved significant accomplishments in the field of cooperation with institutions, organizations and scientific societies, from the time of obtaining doctoral degree in technical sciences up to the present moment.

I cooperate very fruitfully:

a) as regards work safety in mining:

with institutions such as the District Labor Inspectorate in Wrocław, the Office of Technical Inspection, and associations: Association of Mining Engineers and Technicians and the Association of Mining Plant Traffic Managers. This cooperation results in meetings and workshops devoted to work safety in open and underground mining.

b) as regards rational deposit management:

with geologists of starosties and geologists of voivodeships, through the implementation of a series of 8 workshops, of which I was the originator, co-organizer and main speaker.

c) as regards social acceptance of the mining industry:

with entrepreneurs and mining communities, including: Lwówek Śląski, Sulików, Złotoryja, Lubin, Polkowice, Strzegom, Bolesławiec, Wałbrzych, Warta Bolesławiecka, through various forms of cooperation, from active participation in important events for mining communities, e.g. traditional BARBÓRKA, Days of Stone, Agate Summer, Dymarki, to participation in communication teams as a mediator and moderator,

d) as regards raw materials policy:

with the Institute for Mineral Resources and Energy of the Polish Academy of Sciences, the Committee for Sustainable Economy of Mineral Resources, and as part of consultations of the State's Policy on Raw Materials Project with the State Main Geologist,

e) as regards international cooperation:

- **Germany:** Saxon State Mining Authority (SOBA) as part of the INTERREG Program, as the lead partner,
- **Finland:** Regional Council of Lapland - as part of REMIX, as the lead partner,
- **Austria:** University of Mining in Leoben,
- **The Czech Republic:** Ministry of Industry and Trade,
- **Finland:** Joensuu Regional Development Agency in North Karelia,
- **Greece:** National Technical University NTUA in Athens,
- **Spain:** Institute of Business Competitiveness of Castile and Leon, ICE,
- **Portugal:** Faculty of Science and Technology, NOVA University in Lisbon,
- **Great Britain:** University of Exeter,
- **Germany:** Geo-competence Center in Freiberg.

f) as regards presenting good practices in innovative solutions, e.g. – blasting:

with Poltegor - Institute, SSE, MAXAM, AUSTIN; as regards mining waste recovery - Magnezyty Grochów, development of post-mining areas - Pierwoszów,

g) as regards training and ergonomics of work:

with the Copper Education Center in Lubin (MCKK), in the analysis of training programs and guidelines for demonstration workplaces,

h) as regards preservation of the mining cultural heritage:

with the Foundation for Innovation and Cultural Heritage KGHM Polska Miedź S.A. REVIMINE, where, as a result of cooperation, before the liquidation of the folding Gypsum and Anhydrite Mine "Nowy Łąd", it was possible to collect documentary material,

i) as regards popularizing knowledge about mining, the role and importance of the mining industry:

with Association of Mining Engineers through the creation of the Wrocław dwarf "Gwaruś" (Miner), of which I was the originator; with Marshal's Office of the Lower Silesia Voivodeship, Promotion Department, through activities under the REMIX program and INTERREG "Living

with Mining" program, by preparing exhibition devoted to Lower Silesia and Saxony Mining, by study meetings and workshops, evaluation meetings, exchange trips and by editing a manual for solving mining conflicts, which is due to be published in April 2019, as a result of a several-year EU program.

I was the organizer of the Jubilee Conference on the 70th anniversary of Mining and Mining Supervision in Lower Silesia and a co-organizer of the conference beginning the INTERREG "Living with Mining" program (2017), REMIX (2019). I participated actively in over 40 national and international scientific conferences. I also led panel discussions and lecture sessions at industry conferences - Opencast Mining School, KRUSZMIN. I am a member of the Commission on illegal exploitation at the President of the State Mining Authority in Katowice, member of the Mining Sciences Committee of the Polish Academy of Sciences, Wrocław Branch, member of the Committee for Sustainable Mineral Resources Management of the Polish Academy of Sciences, Kraków, member of the Mining Technology Section, member of the Mining Committee of the Polish Academy of Sciences, Kraków, and of the Association of Mining Engineers and Technicians. In 2018 I was appointed to the Scientific Committee POLTEGOR-INSTYTUT, Institute of Opencast Mining. Detailed list of my achievements in the field of cooperation with institutions, organizations, and scientific societies in Poland and abroad, as well as popularization of knowledge, is presented in Annex 5 to the application for the conduct of habilitation proceedings.

8. Indicators - synthesis, after obtaining a doctorate in technical sciences

In Table 2, I presented in a synthetic way the list of scientific and research achievements after obtaining a doctoral degree in technical sciences. The detailed list of achievements is presented in Annex 5 to the application for the conduct of habilitation proceedings.

Table 2. List of scientific and research achievements

| List of scientific and research achievements as of April 2019 | | |
|--|---|-------------|
| No. | CRITERION | NUMBER |
| 1 | Authorship or co-authorship of scientific publications in journals in the Journal Citation Reports (JCR) database | 3 |
| 2 | Authorship or co-authorship of monographs, scientific publications in international or national journals other than in point 1, including: <ul style="list-style-type: none"> • Monographs • Chapters in monographs | 1 5 2 |

| | | |
|---|--|---|
| | <ul style="list-style-type: none"> Chapters in books Scientific publications in journals that do not have an impact factor (IF) Publications in materials from international conferences included in the recognized international database of publications (including WoS, Scopus, ProQuest, EBSCOHost, CrossRef) Publications in materials from international conferences waiting for indexation in the recognized international database of publications (including WoS, Scopus, ProQuest, EBSCOHost, CrossRef) Papers or shortcuts of papers published in conference materials not included in the publication databases | <p>64</p> <p>6</p> <p>2</p> <p>8</p> |
| 3 | Collective studies, catalogs of collections, documentation of research works, expertises, works and artistic works | 7 |
| 4 | Total impact factor according to the JCR list | 4.346 |
| 5 | Number of publications citations: <ul style="list-style-type: none"> according to the Web of Science base according to Google Scholar | <p>26</p> <p>140</p> |
| 6 | Hirsch index of published publications: <ul style="list-style-type: none"> according to the Web of Science base according to Google Scholar | <p>2</p> <p>7</p> |
| 7 | Managing international or national research projects or participation in such projects | 2 |
| 8 | International or national awards for scientific activity / other | 10 |
| 9 | Papers presented at international or national thematic conferences, including: <ul style="list-style-type: none"> - International conferences - taking place abroad - International conferences - organized in Poland - National conferences | <p>46</p> <p>2</p> <p>8</p> <p>38</p> |

In Table 3, I presented a list of didactic and popularizing achievements as well as information on national and international cooperation.

The detailed list of achievements in this field is presented in Annex 5 to the application for the conduct of habilitation proceedings.

Table 3. List of didactic and popularizing achievements and information on national and international cooperation.

| Summary of didactic and popularizing achievements and activities in national and international cooperation. as of April 2019 | | |
|---|--|---|
| No. | CRITERION | NUMBER |
| 1 | Participation in European programs and other international or national programs | 4 |
| 2 | Active participation in international and national scientific conferences, including: <ul style="list-style-type: none"> - work in conference organizing committees - awards and distinctions granted (other than for scientific activity) | <p>46</p> <p>4</p> <p>10</p> |

Miranda Ptak: Summary of professional achievements

| | | |
|----|---|-----------------------------------|
| | - managing projects implemented in cooperation with scientists from other Polish and foreign centers and in cooperation with entrepreneurs | 3 |
| 3 | Participation in editorial committees and scientific councils of journals | 1 |
| 4 | Membership in international and national organizations and scientific societies | 6 |
| 5 | Didactic achievements and in the field of popularization of science: - authorship of curricula - running lectures and practical classes - achievements in the field of popularization of science | 5 11 5 |
| 6 | Scientific care for students | 38 |
| 7 | Scientific care for PhD students as a scientific supervisor or an auxiliary supervisor | - |
| 8 | Conducting custom-prepared expertises or other studies | 7 |
| 9 | Participation in expert and competition teams | 7 |
| 10 | Reviewing publications in international and national magazines | 3 |

Detailed information on my didactic and popularizing achievements as well as information on international cooperation have been provided in Annex 5 to the application for the conduct of habilitation proceedings.