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Sensible Communication Strategy in Mine Water Licensing Processes

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Abstract

Mine water licensing processes often face strong public scrutiny and legal challenges, due to water quality concerns and the lack of technical expertise among plaintiffs and judges in administrative courts. This paper highlights how translating technical concepts into clear legal language and in-dependently assessing applicant data can strengthen permits in legal review. The case of the Saar-land mine water rebound project serves as an example of best practices.

Keywords: Mine water permitting, environmental law, hydrochemistry, administrative court procedures, water re-source management, legal-scientific communication

Note: This paper does not aim to provide a comprehensive account of the entire permitting pro-cess under water and mining law, nor does it elaborate on related aspects such as the Environmen-tal Impact Assessment (EIA), which has been conducted. Instead, the focus lies on the perspective of the water authority and the specific legal considerations under water law that guide the assess-ment and supervision of the mine water rebound.

The Legal Challenge of Mine Water Rebound Processes

Mine water licensing processes often face strong public scrutiny and legal challenges, due to water quality concerns and the lack of technical expertise among plaintiffs and judges in administrative courts. Licensing authorities must therefore communicate transparently without compromising scientific or legal accuracy. This paper highlights how translating technical concepts into clear legal language and independently assessing applicant data can strengthen permits in legal review. The case of the Saarland mine water rebound project serves as an example of best practices. In recent decades, mine water-related projects have faced increasing public scrutiny, particularly in developed countries governed by the rule of law. Environmentally aware societies often see changes to the status quo as potential threats to health and well-being. Mining projects, in particu-lar, are frequently suspected of causing harm to groundwater and surface water systems, fueling concerns about environmental degradation and long-term health impacts. As a result, administra-tive courts often become the final decision-makers.

A key challenge in this process is that neither plaintiffs nor judges typically possess the necessary scientific or technical expertise to fully assess the potential environmental effects of a project. As a result, a fundamental objective in mine water permitting must be to lower the barriers to under-standing, ensuring that administrative judges can grasp both the technical foundations and regula-tory rationale of a permit. This is particularly critical for licensing authorities, which not only issue permits based on legal provisions but must also defend them in court against legal challeng-es.

As the German saying goes, "Vor Gericht und auf hoher See sind wir in Gottes Hand" – "Before the court and on the high seas, we are in God's hands." This highlights the unpredictability of legal The Interplay Between Legal and Scientific Approaches in Mine Water permitting proceedings, espe-

cially when scientific complexity meets legal interpretation.

The Interplay Between Legal and Scientific Approaches in Mine Water Permitting

One of the fundamental differences between the legal and scientific approaches in mine water per-mitting is how each side perceives and processes information. The legal perspective is focused on properly describing a given situation to determine which legal norms apply. Judges and legal pro-fessionals must categorize facts within existing legal frameworks to establish compliance, liability, and regulatory obligations. Their challenge lies in ensuring that a project is accurately represented in a manner that allows for proper legal classification.

On the other hand, the scientific and technical perspective is primarily concerned with identifying, analyzing, and solving complex environmental and engineering challenges. Experts focus on water flow dynamics, chemical processes, and system interactions, aiming to predict outcomes and miti-gate potential risks. Their challenge is translating these complexities into a clear, structured form that non-experts can understand.

A viable permit requires mutual understanding between legal and technical experts. However, in practice, legal and technical professionals often communicate in a formal, text-based manner without actively ensuring that mutual comprehension is achieved. This can lead to misinterpretations, incomplete assessments, and legal vulnerabilities. The key to bridging this gap lies in an iterative process of information exchange, where both legal and technical professionals continuously refine descriptions, verify interpretations, and ensure alignment. Each step must include cross-checks to confirm that a shared understanding has been reached.

Crucially, the description of the underlying factual situation is entirely within the hands of the scientific and technical side. A well-structured and precise technical description will almost inevi-tably lead to the correct legal classification. In other words, the technical side plays a decisive role in shaping the legal outcome. By carefully framing the environmental and engineering realities of a project, scientific experts effectively guide the legal determination of whether a project meets reg-ulatory standards. Thus, an accurate and strategically framed technical description can predefine the legal solution, ensuring that the permit conditions align with both scientific realities and legal requirements.

Comprehensive Understanding as the Basis for a Defensible Permit

To achieve a robust and defensible permit, the licensing authority must possess a deep under-standing of the project and its environmental context. This requires comprehensive and accurate information, necessitating close collaboration between applicants, experts, and regulatory bodies. Engaging early with authorities helps align applications with regulatory and scientific expecta-tions, streamlining approval.

While the application documents themselves should maintain scientific and technical accuracy, the wording of the final license must adhere to legal language. However, directly translating complex technical descriptions into the legal text can create ambiguities and misinterpretations, particular-ly among the general public and legal professionals who may lack specialized background knowledge. To mitigate this risk, the permit should be structured using clear and accessible lan-guage wherever possible. This includes rewording technical concepts into legally precise yet comprehensible terms, ensuring that the reasoning behind the permit conditions is transparent.

A critical component of this strategy is the independent assessment and refinement of technical descriptions provided by the applicant. Instead of merely adopting the terminology and conclu-sions of the applicant's reports, the licensing authority should actively reframe key hydraulic and hydrochemical concepts, demonstrating a critical and independent review process. This approach not only strengthens the authority's credibility in court but also reassures judges that the permit is based on a thorough and impartial evaluation rather than a passive endorsement of the appli-cant's claims.

To further enhance the effectiveness of this strategy, the following principles should be applied:

1. **Clarity in Communication** – Technical terms should be translated into accessible language without losing scientific accuracy. Judges and the public must be able to under-stand the key aspects of the project, including water flow dynamics, contamination risks, and mitigation strategies.
2. **Legal and Scientific Consistency** – The permit should be legally sound while maintaining scientific integrity. Balancing legal precision with scientific clarity prevents misunderstandings and strengthens the permit's defensibility in court.
3. **Independent Review and Critical Assessment** – The licensing authority must demonstrate an independent assessment of the application. Reformulating key technical concepts and supplementing them with additional expert reviews ensures credibility.
4. **Precautionary Approach** – Where scientific uncertainties exist, the permit should explicitly acknowledge them and integrate precautionary measures such as contin-uous monitoring, adaptive management, and contingency planning.
5. **Early and Continuous Engagement** – Close coordination with experts, appli-cants, and stakeholders throughout the process ensures that the final permit reflects a well-informed and balanced assessment of risks and mitigation measures.

Mine Water Rebound Project in Saarland, Germany

The mine water rebound project in Saarland is one of the most significant water management initi-atives in the region. It involves the controlled rise of mine water in decommissioned coal mines while ensuring environmental protection and compliance with regulatory requirements.

After more than 250 years of coal mining and the extraction of about 1,400,000,000 metric tons of coal, in 2012 mining activity in Saarland come to an end. In the neighbouring and hydraulically connected coalfield of Lorraine in France, coal mining already had ended in 2004 and in Summer of 2006 the

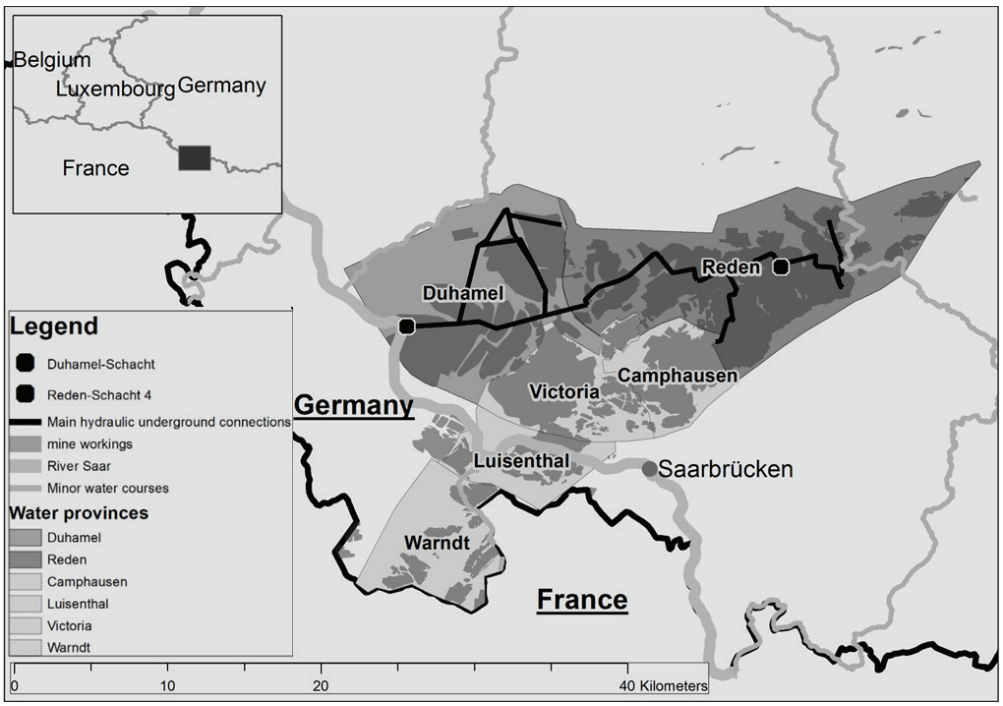

Figure 1 Saar Coalfield with its different water provinces. Dewatering in Reden will be stopped and mine water will rise to -320 m asl, so that Duhamel will dewater both provinces.

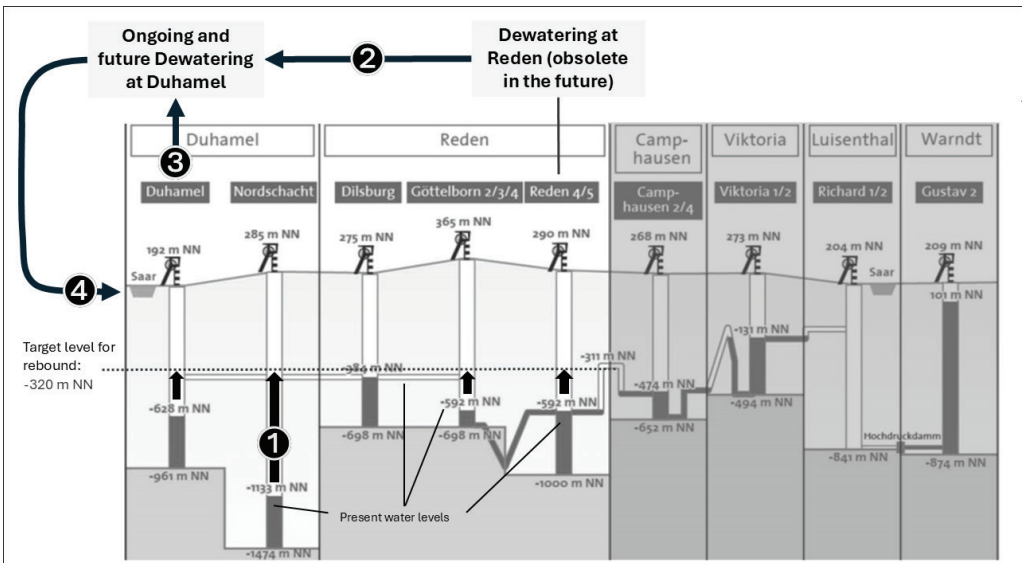

Figure 2 Current Dewatering System and Planned Target Levels in the Saar Coalfield. Under Water Law the following aspects where considered as relevant: the potentially harmful effect of first flush due to the rebound (1), the transfer of mine water from one province to the next (2), the final abstraction of mine water at Duhamel shaft (3) and the injection of the water into the river Saar (4)

controlled process of mine water rebound was started (Westermann *et al.*, 2019). After a first outline of a complete rebound in 2014 (RAG AG, 2014), RAG AG presented the application for a partial rebound in the water provinces Reden and Duhamel in 2017, which resulted in the permit issued in 2021 after a long process of assessments and discussions with the applicant and external experts.

The project is primarily governed by the German Federal Mining Act (Bundesberggesetz, BBergG, 1980) and the German Water Resources Act (Wasserhaushaltsgesetz, WHG, 2008), the latter set-ting out strict conditions for groundwater management, water body transfers, and pollution con-trol. For the decision on the project, a mining law planning approval procedure was required, in which the mining authority, under German law, grants not only the mining-related but also the water law permits; however, this must be done in agreement with the competent water authority.

Key WHG provisions relevant to the Saarland project include:

Section 8 WHG (Water Use Permit) – Any use of ground- or surface water is subject to a permitting procedure.

Section 9 WHG (Types of Water Use) – The extraction as well as discharge of mine water into surface water bodies are considered as direct water uses and therefore subject to permits. This was also seen by the applicant and thus applied for, while a permit for the transfer of mine water between underground compartments had not been requested by the applicant. This also applies to the so-called indirect use of groundwater as the rise of mine water, due to its potentially detrimental impact on groundwater quality. These as-pects have been included in a permit for the first time in Germany.

Section 48 WHG (Obligations to Prevent Harmful Changes to Water Bodies) – The project must include monitoring and mitigation strategies to prevent detrimental changes to wa-ter quality and flow regimes.

One important aspect is the transfer of mine water between different water bodies, including un-derground reservoirs and its longevity. This was legally a new concept in the licensing process. The permit needed to establish clear conditions under which such transfers are allowed, address-ing both

quantitative and qualitative impacts as in accordance with WHG regulations.

The concept of indirect water use plays a crucial role in the licensing process. The gradual rise of mine water influences regional groundwater levels and interconnected water bodies, which can have significant environmental and hydrological consequences. It also can cause substantial hy-dro-chemical changes of the mine water itself, but also of all connected water bodies due to the first flush effect, where rising mine water mobilizes contaminants (Younger *et al*, 2002, Wolkers-dorfer, 2008). This aspect so far has been considered for the first time in a permit related to mine water rebound. The permit therefore considers not only direct discharges but also secondary effects, ensuring that regulatory requirements for both direct and indirect water use are fully ad-dressed.

The licensing process for mine water rebound in Saarland regarding water law issues involves multiple administrative steps and coordination between regulatory bodies:

- **Pre-Application Consultation** – The mining company (applicant) engages with the envi-ronmental and mining authorities to clarify legal and technical requirements.
- **Submission of Application** – The applicant submits detailed documentation, including hydrogeological studies, environmental impact assessments, and risk evaluations.
- **Public Participation and Stakeholder Engagement** – In line with transparency princi-ples, the application undergoes public review, allowing objections and concerns to be ad-dressed.
- **Technical and Legal Evaluation** – The Water Authority (Ministry of Environment) inde-pendently assesses the documentation, revising key descriptions to ensure clarity and compliance with legal standards. In order to be able to being able to properly do so, Saar-land's government had several reports prepared by external independent experts includ-ing a ground- and a minewater model.
- **Coordination with the Mining Authority** – The mining authority ensures that mine safe-ty and subsurface stability are considered alongside environmental concerns. Under Ger-man law, the mining authority is the primary permitting body for mining-related activities, making final decisions in agreement with the water authority.
- **Permit Issuance and Conditions** – A final permit is granted with clear conditions, moni-toring obligations, and contingency plans (OBA SL, 2021).
- **Judicial Review** – In case of legal challenges, administrative courts review the decision, where the clarity and legal robustness of the permit text play a decisive role

Comparison of Key Permit Elements

Drinking Water Protection: Applicant's Argument vs. Permit Language

The applicant originally described the risk to drinking water resources in terms of generalized hydrogeological models, emphasizing that no substantial effects were expected due to the natural separation of mine water and the overlying aquifers by more than 300 m. While these statements were scientifically not wrong, they did not address the fact that it's primarily the hydraulic gradient and not – as described in the text – the distance of the mine water from the bottom of the aqui-fer that controls a potential flow of mine water into an aquifer.

In contrast, the permit text corrected the wording and redefined the risk assessment with a more detailed analysis of local groundwater flow, introducing additional monitoring requirements and contingency measures. This demonstrated that the authority had not simply accepted the applicant's assurances but had critically assessed and expanded the evaluation to include a more pre-cautionary approach.

Transfer Between Water Bodies: Expanding Beyond the Applicant's Scope

The applicant's documentation primarily focused on local water retention and discharge but pro-vided only limited discussion on the regulatory implications of transferring mine water between hydrologically distinct water bodies. This aspect was crucial from a legal perspective, as inter-basin transfers could

have broader regulatory consequences under the Water Resources Act (WHG).

The permit addressed this gap by explicitly defining the conditions under which mine water trans-fers were permissible, including legal references and additional environmental impact assess-ments. By doing so, the licensing authority demonstrated independent expertise and regulatory foresight, reinforcing the robustness of the permit in legal proceedings.

Conclusion

By bridging the gap between scientific accuracy and legal clarity, the licensing authority enhances both public trust and judicial comprehensibility. This strategy ultimately reduces the risk of legal challenges succeeding due to misunderstandings or perceived regulatory weaknesses. The key to success in administrative court proceedings lies in presenting a well-documented, legally sound, and scientifically justified permit in a language that is accessible to both legal professionals and the wider public.

So, we are not necessarily "in God's hands" before the courts. The strategy of full transparency, clear communication, and independent assessment has proven its worth. In every legal challenge faced so far, the courts have upheld our decisions, often citing directly from the permit in their reasoning: Three of these lawsuits have already been heard and dismissed, three additional cases were recently tried, and decisions are expected in the coming days,14 further lawsuits have since been withdrawn. This demonstrates that a well-structured, scientifically sound, and legally pre-cise permit is the key to success—not only in public administration but also in the courtroom.

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