Customary Law Journal, ICLSSEE Special Collection 2026, *Page*: 1-10

Reform of the Administrative Sanctions System for Violations of Downstreaming Obligations by Mining Business Permit Holders

Frans Irawan*, Lucky Ferdiles

Borobudur University, Jakarta, Indonesia, frans.irawan@yahoo.co.id

Borobudur University, Jakarta, Indonesia, lucky_ferdiles@borobudur.ac.id

DOI:
https://doi.org/10.47134/jcl.v3i3.1.5809
*Correspondence: Frans Irawan

Email: frans.irawan@yahoo.co.id

Received: 19/05/2026
Accepted: 13/06/2026
Published: 13/06/2026

Abstract: *This study aims to analyze and reconstruct the administrative sanctions system for enforcing downstreaming obligations in the mineral and coal mining sector, based on Article 33 of the 1945 Constitution and the provisions of Law Number 3 of 2020 and Law Number 6 of 2023. The research method used is a normative juridical approach, with a statutory and conceptual perspective. The results indicate that although downstreaming obligations have been formulated imperatively through the provisions of Article 103 and Article 170 of the Mineral and Coal Mining Law, the existing administrative sanctions system is ineffective due to normative weaknesses such as unclear violation parameters, the lack of measurable success indicators, and the broad discretion of administrative officials. Empirically, weak oversight, inconsistent enforcement of sanctions, and tolerance for violations have created a gap between legal norms and their implementation in the field. Therefore, it is necessary to reconstruct the administrative sanctions system through the implementation of tiered sanctions, the imposition of administrative fines based on state losses, the strengthening of technology-based oversight systems, and the harmonization of regulations between sectors to increase the effectiveness of law enforcement and encourage the success of downstreaming as an instrument of national economic development.*

Keywords: *downstreaming, administrative sanctions, mineral and coal mining*

Introduction

The urgency of mineral downstreaming in national policy cannot be separated from the philosophical foundation of state control over natural resources, as affirmed in Article 33 of the 1945 Constitution, specifically paragraph (3), which states that the land, water, and natural resources contained therein are controlled by the state and used for the greatest prosperity of the people. (Farhani, 2019) This constitutional norm serves as the basis for the state's legitimacy to not simply permit the exploitation of mineral resources but also direct their utilization through downstreaming policies to increase added value, strengthen national industrialization, and ensure economic resilience. (Prasetyo, 2025) In national development policy, downstreaming has been placed on the strategic agenda in the National Medium-Term Development Plan and in energy and industrial policies, which emphasize that exporting raw materials is contrary to the spirit of economic sovereignty.

(Ika, 2017) Thus, downstreaming is not simply a policy choice but rather a constitutional imperative that encompasses dimensions of distributive and intergenerational justice.

Normatively, the evolution of downstreaming regulations in Indonesian mining law demonstrates a strengthening of legal obligations over time, starting with Law Number 4 of 2009 concerning Mineral and Coal Mining, which was subsequently updated by Law Number 3 of 2020 and, finally, adjusted by Law Number 6 of 2023. (Illahi, 2022) Within this legal regime, the obligation to process and refine domestically is explicitly affirmed, including in Articles 103 and 170 of the Minerba Law, which require IUP and IUPK holders to increase added value through processing and refining activities. (Rachmawati, 2024) Furthermore, the policy prohibiting the export of raw minerals serves as a coercive legal instrument to ensure the implementation of downstreaming. The centralization of mining authority to the central government following the amendment to the law also emphasizes the state's role as the primary regulator responsible for controlling and supervising downstreaming activities, while reducing policy fragmentation at the regional level. (Al Idrus, 2022)

The obligation to downstream mining for Mining Business Permit holders is an inherent legal requirement attached to the permit, so that violations of this obligation constitute violations of the permit itself. This is reflected in the risk-based legal construction of permits adopted in the business licensing system, where permits not only grant rights but also impose obligations that must be met on an ongoing basis. (Putri, 2025) Concrete forms of downstreaming obligations include the construction of processing and refining facilities (smelters) or collaboration with other parties that own such facilities. Thus, there is a close legal relationship between the validity of a business permit and the fulfillment of downstreaming obligations, so that failure to fulfill these obligations should have direct implications for the permit's continuation. (Setiawan, 2025) Theoretically, this aligns with the principle of conditional licensing in administrative law, under which a permit can be revoked if the conditions attached to it are not met.

However, in practice, violations of downstreaming obligations still frequently occur in various forms, such as illegal exports of raw minerals, regulatory loopholes, delays in smelter construction, and manipulation of development progress reports. This situation indicates a gap between legal norms and their implementation (law on the books versus law in action). (Widyaningrum, 2024) The contributing factors include the high investment costs of smelter construction, a weak oversight system, and a conflict of interest between short-term economic interests and long-term legal obligations. The impact of these violations is significant, both in the form of state losses due to the loss of potential added value, hampered national industrialization, and the emergence of unequal economic development. (Ika, Mineral Downstreaming Policy: Policy Reform to Increase State Revenue, 2017) Therefore, this issue is not only an issue of administrative compliance, but also concerns the state's failure to realize its constitutional goals of natural resource management.

Within the positive legal framework, the administrative sanctions system in the mining sector is essentially regulated, including through provisions in the Mineral and Coal Mining Law and its implementing regulations, which specify sanctions such as written warnings, temporary suspension of activities, and permit revocation. Theoretically, administrative sanctions have both preventive and repressive functions (Akhmadi, 2024)

and serve as the primary instrument in administrative law enforcement before resorting to criminal or civil proceedings. However, normatively, there are several fundamental weaknesses, including the lack of clear parameters for the level of violation of downstreaming obligations, the absence of measurable success indicators, and the government's broad discretion in determining the type and level of sanctions. (Khareskawati, 2023) This situation has the potential to lead to inconsistencies in law enforcement, ultimately weakening the coercive power of legal norms themselves and creating legal uncertainty for business actors.

The problematic implementation of administrative sanctions increasingly demonstrates regulatory failure, characterized by inconsistent application of sanctions, tolerance of violations, and administrative negotiation practices that have the potential to obscure the principle of equality before the law. Furthermore, institutional issues arise, such as weak inter-agency coordination and limited oversight capacity. (Nugroho, 2026) From a comparative perspective, several countries, such as Australia and Chile, have implemented stricter administrative sanction systems, including strict administrative liability and the imposition of financial fines based on state losses, which can serve as references for national legal reform. On the other hand, regulatory gaps and disharmony persist, both between the Mineral and Coal Mining Law and its derivative regulations and with other legal regimes such as environmental and investment law, further complicating law enforcement. (Attamimi, 2026) Therefore, a reconstruction and renewal of the administrative sanction system based on compliance, risk, and outcomes is necessary to strengthen the state's role as an effective regulator and ensure optimal achievement of downstreaming objectives, while simultaneously realizing legal certainty and justice for all stakeholders.

Methodology

This research uses a normative juridical research method, namely legal research that examines applicable positive legal norms, by positioning law as an autonomous and prescriptive system of rules. The approaches used are the statutory and conceptual approaches. The legislative approach is carried out by systematically reviewing various relevant laws and regulations, particularly Law Number 3 of 2020, Law Number 6 of 2023, and other implementing regulations related to downstreaming obligations and the administrative sanctions system in the mineral and coal mining sector, to identify normative structures, consistencies, and potential regulatory disharmony. Meanwhile, the conceptual approach is carried out by reviewing legal doctrines, principles of state administrative law, and theoretical concepts such as administrative sanctions, legal compliance, and the effectiveness of law enforcement, which have developed in the legal literature and expert opinions, as a basis for analysis in formulating an ideal legal construction. The legal materials used consist of primary legal materials in the form of laws and court decisions, secondary legal materials in the form of books, scientific journals, and previous research results, and tertiary legal materials in the form of legal dictionaries and encyclopedias. These were then analyzed qualitatively using systematic, grammatical, and teleological interpretive methods to produce comprehensive and prescriptive legal arguments for the renewal of the administrative sanctions system for enforcing downstreaming obligations.

Result and Discussion

Legal Construction of Downstreaming Obligations and the Administrative Sanctions System in Mineral and Coal Mining

The legal construction of downstreaming obligations in the mineral and coal mining sector is fundamentally rooted in the principle of state control over natural resources, as affirmed in Article 33 of the 1945 Constitution, specifically paragraph (3), which grants the state constitutional legitimacy to regulate, manage, and supervise the utilization of mineral resources for the greatest prosperity of the people. Within this framework, the downstreaming policy is not merely an economic policy but rather a manifestation of the constitutional mandate that demands sustainable, value-added management of natural resources. Therefore, the state not only has the authority to grant exploitation permits but also establishes a legal obligation for business actors to process and refine mining products domestically as a form of control over exploitation practices oriented towards the export of raw materials. (Kamala, 2023)

Normatively, the obligation to downstream is expressly regulated by Law Number 3 of 2020, which amended Law Number 4 of 2009 and was further strengthened by Law Number 6 of 2023. Article 103 paragraph (1) of the Mineral and Coal Mining Law stipulates that IUP and IUPK holders are required to increase the added value of mineral and/or coal resources during mining through processing and/or refining activities. (Wasis, 2024) Article 170 stipulates the obligation for Contract of Work holders to refine domestically within a specified timeframe. This norm demonstrates that the obligation to downstream is imperative and does not give business actors the freedom to choose whether to implement it. Therefore, downstreaming is a legal obligation directly attached to the status of a mining business permit. (Rahayu, 2025)

The creation of these obligations is also closely related to the licensing regime in state administrative law, where mining business permits (IUP/IUPK) not only grant rights but also serve as control instruments that impose conditions and obligations that permit holders must meet. From this perspective, downstreaming obligations can be understood as conditions attached to the license that, if not met, may result in administrative sanctions, including permit revocation. This aligns with the principle of bestuursrechtelijke handhaving in administrative law, which places administrative sanctions as the primary tool for ensuring compliance with legal norms. (Agung, 2023) Therefore, the relationship between downstreaming obligations and the validity of business permits is causal and inseparable.

With regard to the administrative sanctions system, the provisions of the Mineral and Coal Mining Law and its implementing regulations establish various sanctions that may be imposed for violations of downstreaming obligations. Provisions regarding administrative sanctions include written warnings, temporary suspension of some or all business activities, and revocation of mining business permits. (Simanjuntak, 2025) These sanctions are further regulated in various derivative regulations, including government regulations and ministerial regulations governing the procedures for imposing sanctions. Theoretically, administrative sanctions have a preventive function to encourage early compliance and a

repressive function to deter violations that have already occurred. (Putri I. R., 2025) In this context, administrative sanctions are positioned as a primum remedium, namely the primary means of law enforcement before resorting to a criminal approach as an ultimum remedium.

However, the administrative sanctions system under mining law still exhibits several normative weaknesses. One major problem is the lack of clear parameters regarding the level of violation of downstreaming obligations, making it difficult to determine the type and level of proportional sanctions. Furthermore, there are no measurable indicators to assess the success of processing and refining obligations, leaving law enforcement heavily reliant on the discretion of administrative officials. This broad discretion has the potential to lead to inconsistencies in the application of sanctions and opens up opportunities for abuse of authority. This situation indicates weaknesses in the normative construction, which have implications for the low effectiveness of the administrative sanctions system. (Khoiro, 2024)

It can be concluded that the legal construction of downstreaming obligations and the administrative sanctions system in the mineral and coal mining sector in Indonesia has a strong formal legal basis, but still faces challenges in substance and implementation. On the one hand, downstreaming obligation norms have been firmly formulated and are binding, but on the other hand, the administrative sanctions system, which should be the primary instrument of law enforcement, has not fully guaranteed business compliance. Therefore, strengthening the legal framework is necessary, both by formulating clearer, more measurable norms and by improving law enforcement mechanisms, so that the goal of downstreaming as an instrument for increasing added value and national economic sovereignty can be optimally achieved.

Normative Weaknesses and Problems in the Implementation of Administrative Sanctions for Violations of Downstreaming Obligations

The normative weaknesses in the regulation of administrative sanctions for violations of downstreaming obligations in the mineral and coal mining sector are fundamentally rooted in the unclear definition of the parameters governing violations and compliance indicators. Although downstreaming obligations are affirmed in Law Number 3 of 2020, specifically in Article 103 paragraph (1) and Article 170, these provisions do not explicitly define a definitive measure of when a business actor is deemed to have fulfilled or violated processing and refining obligations. This lack of clarity creates normative ambiguity, making it difficult to determine the basis for imposing administrative sanctions and thus weakening the implementation of what should be an imperative legal norm. From a legal theory perspective, this situation indicates a flaw in norm formulation, with implications for weak law enforcement.

Furthermore, normative weaknesses are also evident in the regulation of the types and gradations of administrative sanctions, which have not been systematically and proportionally formulated. Under the Mineral and Coal Mining Law and its implementing regulations, administrative sanctions generally include written warnings, temporary suspension of business activities, and permit revocation. However, there are no detailed

regulations regarding the stages or the escalation of sanctions based on the level of violation, thereby leaving extensive discretion to administrative officials. This has the potential to create legal uncertainty and unfairness in the application of sanctions, as violations of varying degrees of seriousness may be subject to the same or opposite sanctions. In this context, the absence of the principle of proportionality in the regulation of administrative sanctions is a fundamental weakness in the mining legal system.

Another normative weakness is the lack of integration of the administrative sanctions system in the mining sector with other legal regimes, such as environmental law and investment law. Violations of downstreaming obligations not only impact the economic aspect but also have implications for environmental sustainability and investment governance. This disharmony is evident in the lack of synchronization between the Mineral and Coal Mining Law and environmental laws and regulations, particularly regarding reclamation and post-mining obligations, as well as investment policies that tend to provide incentives without being balanced by firm sanction mechanisms. As a result, the administrative sanctions system is fragmented and unable to provide a comprehensive response to violations of downstreaming obligations.

Empirically, the problematic implementation of administrative sanctions for violations of downstreaming obligations demonstrates a significant gap between legal norms and practice (law on the books versus law in action). One frequent phenomenon is delays in the construction of processing and refining facilities (smelters) by IUP/IUPK holders, despite this obligation being expressly stipulated in Article 103 of the Mineral and Coal Mining Law. Furthermore, the practice of indirect export of raw minerals through regulatory loopholes, as well as the manipulation of smelter construction progress reports to avoid sanctions, remains undiscovered. This situation indicates that the existing oversight system is incapable of effectively detecting and prosecuting violations.

Implementation problems are further exacerbated by weak enforcement of administrative sanctions, characterized by inconsistent application of sanctions to violators. In many cases, business actors who fail to fulfill downstreaming obligations are subject only to sanctions in the form of warnings or additional time limits, without any firm action, such as suspension of activities or permit revocation. This phenomenon reflects a practice of administrative leniency that could undermine the credibility of the legal system. Contributing factors include economic pressure to maintain investment, conflicts of interest between regulators and business actors, and limited institutional capacity to conduct oversight and enforce the law.

Institutional barriers are also a significant factor in the problematic implementation of administrative sanctions. The centralization of mining authority to the central government following the amendment to the Mineral and Coal Mining Law has not been fully offset by strengthening supervisory institutions, resulting in ineffective coordination among agencies. Furthermore, limited human resources, supervisory technology, and an unintegrated information system have resulted in suboptimal oversight of the implementation of downstreaming obligations. From a law enforcement perspective, this situation indicates a serious enforcement gap: well-formulated legal norms are not

accompanied by adequate implementation mechanisms. Therefore, without comprehensive reform of both normative and institutional aspects, the administrative sanctions system for violations of downstreaming obligations will remain ineffective and unable to achieve the desired legal objectives.

Reconstruction and Reform of the Administrative Sanctions System in Enforcing Downstreaming Obligations

Reconstruction and reform of the administrative sanctions system for enforcing downstreaming obligations must begin with a reaffirmation of administrative sanctions as the primary instrument (primum remedium) in state administrative law to ensure business compliance. Within the framework of Article 33 of the 1945 Constitution and the provisions of Law Number 3 of 2020, particularly Article 103, the state is obliged not only to establish norms but also to ensure their effective implementation through a firm, measurable, and consistent sanctions system. Therefore, the reconstruction must focus on strengthening the normative design of administrative sanctions so that they are no longer general and abstract, but rather grounded in concrete, measurable indicators. Concrete actions that need to be taken include explicitly specifying downstream achievement standards in implementing regulations, such as the percentage of smelter construction progress, production capacity, and clear deadlines, so that violations can be objectively identified.

Reforms to the administrative sanctions system must adopt a progressive sanctioning system based on the severity of the violation and the level of risk posed. In this regard, revisions to the implementing regulations of the Mineral and Coal Mining Law are necessary to establish systematic stages of sanctions, starting with administrative warnings accompanied by an obligation to improve within a specified timeframe, up to the imposition of more severe sanctions such as administrative fines, suspension of activities, and permit revocation. A concrete action that can be taken is to introduce an administrative monetary penalty scheme calculated based on the magnitude of state losses resulting from the failure to implement downstreaming. This will ensure that sanctions are not merely formal but also provide a real deterrent effect. This way, the principles of proportionality and fairness in imposing sanctions can be more optimally realized.

Reconstruction must also include limiting the discretion of administrative officials by formulating more rigid, standardized norms. To date, the broad discretionary space in determining the type and level of sanctions has led to inconsistencies and the potential for abuse of authority. Therefore, it is necessary to codify the parameters of violations and sanctions in the form of binding technical guidelines, so that each violation of downstreaming obligations is automatically linked to a specific type of sanction. Concrete actions that can be taken include developing a compliance matrix that links the level of business actor compliance to the consequences of the sanctions imposed, as well as implementing a digital monitoring system that enables real-time, transparent compliance evaluation.

Furthermore, reforming the administrative sanctions system must also strengthen oversight and law enforcement by integrating institutions. In this context, synergy is needed among technical ministries, supervisory agencies, and law enforcement officials to ensure

that any violation of downstreaming obligations is dealt with swiftly and appropriately. Concrete actions that can be taken include establishing a special task force for downstreaming supervision with cross-sectoral authority and developing an integrated information system that contains data on permits, downstreaming progress, and business actors' compliance history. Furthermore, an independent, periodic audit mechanism must be implemented to verify business actors' reports, thereby minimizing data manipulation.

The reconstruction of the administrative sanctions system must lead to the implementation of a compliance-based, output-based regulatory approach. In this approach, business actors are assessed not only on the fulfillment of formal obligations but also on tangible achievements in increasing the added value of minerals. Concrete actions include establishing key performance indicators (KPIs) for IUP/IUPK holders related to downstreaming and linking them to administrative incentives and disincentives. For example, businesses that meet downstreaming targets can be granted licensing facilitation or fiscal incentives, while those that do not meet them are subject to progressively more severe sanctions. This approach will encourage a shift in business behavior from mere formal compliance to substantive compliance.

Reforms to the administrative sanctions system must be directed at strengthening legal certainty and fairness for all stakeholders, while ensuring that downstreaming serves the objectives of national economic development. This aligns with the strengthening of norms in Law Number 6 of 2023, which emphasizes the importance of effective licensing and risk-based supervision. Concrete actions that need to be taken include harmonizing regulations across sectors, clarifying the relationship between administrative sanctions and criminal and civil sanctions, and ensuring that every violation of downstreaming obligations is consistently addressed without exception. Thus, the reconstructed administrative sanctions system will not only serve as a law enforcement tool but also as a strategic instrument for realizing economic sovereignty and equitable natural resource management.

Conclusion

The conclusion of this study indicates that the legal framework for downstreaming obligations in the mineral and coal mining sector in Indonesia has a strong normative basis, both in Article 33 of the 1945 Constitution and in Law Number 3 of 2020 and Law Number 6 of 2023, which explicitly mandate increased added value through domestic processing and refining activities. However, the administrative sanctions system, as the primary instrument for enforcing these obligations, still faces fundamental weaknesses, both normatively and implementably. Normatively, there is an unclear parameter for violations, a lack of measurable indicators of downstream success, and a wide discretionary space for administrative officials, which could lead to inconsistencies in law enforcement. Meanwhile, empirically, weak oversight, tolerance for violations, and limited institutional capacity result in administrative sanctions being ineffectively implemented, creating a gap between legal norms and practice. This situation indicates that the existing administrative sanctions system is incapable of ensuring business compliance or realizing the goal of downstreaming as an instrument for increasing added value and national economic sovereignty.

Based on these findings, this study recommends that the administrative sanctions system be reconstructed and renewed to be more comprehensive, measurable, and oriented towards effective law enforcement. This reform needs to be carried out by formulating clear, results-based downstream compliance indicators, implementing a proportional, tiered sanctions system that includes the imposition of administrative fines based on state losses, and restricting official discretion through standardized, binding guidelines. Furthermore, it is necessary to strengthen oversight through institutional integration, the use of information technology for real-time compliance monitoring, and the capacity-building of supervisory officials. Harmonizing regulations between sectors is also a crucial step to address the legal disharmony that has hampered the effectiveness of sanctions enforcement. With these steps, it is hoped that the administrative sanctions system in the mining sector will function not only as a law enforcement tool but also as a strategic instrument that encourages business compliance, ensures legal certainty, and realizes equitable and sustainable natural resource management.

References

Agung, M. H. (2023). Analisa Hukum Terhadap Pemanfaatan Logam Tanah Jarang Berdasarkan UU No. 3 Tahun 2020 Tentang Perubahan Atas Undang-Undang No. 4 Tahun 2009 Tentang Pertambangan Mineral Dan Batubara JO. PP No. 96 Tahun 2021 Tentang Pelaksanaan Kegiatan Usaha Pertambangan. UNES Law Review, 6739-6752.

Akhmadi, F. (2024). Analisis Dampak Hilirisasi Terhadap Pertumbuhan Ekonomi Di Indonesia. Hatta: Jurnal Pendidikan Ekonomi Dan Ilmu Ekonomi, 25-31.

Al Idrus, N. F. (2022). Dampak Politik Hukum Dan Respon Masyarakat Atas Pembaharuan Undang-Undang Minerba. Jurnal Penegakan Hukum Dan Keadilan, 114-12.

Attamimi, M. R. (2026). Ketika Hilirisasi Menjadi Beban: Analisis Kritis Implementasi Kewajiban IUP Nikel Di Era Downstreaming Indonesia. Al-Zayn: Jurnal Ilmu Sosial & Hukum, 1913-1924.

Farhani, A. A. (2019). Penguasaan Negara Terhadap Pemanfaatan Sumber Daya Alam Ruang Angkasa Menurut Undang-Undang Dasar Negara Republik Indonesia Tahun 1945. Jurnal Konstitusi , 235-254.

Ika, S. (2017). Kebijakan Hilirisasi Mineral: Policy Reform Untuk Meningkatkan Penerimaan Negara. Kajian Ekonomi Dan Keuangan, 42-67.

Ika, S. (2017). Kebijakan Hilirisasi Mineral: Policy Reform Untuk Meningkatkan Penerimaan Negara. Kajian Ekonomi Dan Keuangan, 42-67.

Illahi, A. R. (2022). Hilirisasi Pertambangan Dan Dampaknya Terhadap Aspek Ekonomis Lingkungan Hidup Di Indonesia. Jurnal Justitia: Jurnal Ilmu Hukum Dan Humaniora, 1436-1444.

Kamala, R. A. (2023). Manifestasi Kebijakan Produk Dimethyl Ether Dalam Skema Hilirisasi Batubara Sebagai Transformasi Peningkatan Kesejahteraan Rakyat. Jurnal Restorasi Hukum, 168-184.

Khareskawati, N. E. (2023). Inovasi Bisnis Dalam Bidang Pertambangan: Studi Kepustakaan. Innovative: Journal Of Social Science Research , 8372-8380.

Khoiro, E. U. (2024). Kebijakan Hilirisasi Sumber Daya Alam Mineral Di Indonesia: Analisis Bibliometrik. Jurnal Edueco, 131-137.

Nugroho, H. A. (2026). Hilirisasi Pertambangan Dan Masa Depan Industrialisasi Indonesia: Pembelajaran Historis Dan Rekomendasi Strategis. Bappenas Working Papers, 215-235.

Prasetyo, M. H. (2025). Dampak Kerusakan Lingkungan Akibat Eksploitasi Sumber Daya Mineral Dari Kegiatan Pertambangan. Hidroponik: Jurnal Ilmu Pertanian Dan Teknologi Dalam Ilmu Tanaman, 1-11.

Putri, D. H. (2025). Tantangan Dan Peluang Hilirisasi Pertambangan Komoditas Mineral Batubara Menuju Indonesia Emas 2045: Evaluasi Penegakan Hukum Dan Penataan Administrasi Perizinan Tambang. Jurnal Rechts Vinding: Media Pembinaan Hukum Nasional, 141.

Putri, I. R. (2025). Ketidakpastian Hukum Dan Investasi Dalam Hilirisasi: Studi Komparatif Indonesia Dan China Dalam Pengembangan Energi Terbarukan. Jurnal Rechtsvinding, 83-106.

Rachmawati, A. R. (2024). Kewajiban Hukum Perusahan Tambang Dalam Penyedian Fasilitas Smelter Sebagai Upaya Mendukung Program Hilirisasi. Inicio Legis, 65-75.

Rahayu, D. P. (2025). Sovereign Wealth Fund Dan Tata Kelola Investasi Pertambangan Timah Di Bangka Belitung: Sinergi Antara Kedaulatan Sumber Daya, Hilirisasi, Dan Ekoregulasi. Konferensi Nasional Asosiasi Pengajar Hukum Tata Negara Dan Hukum Administrasi Negara, 37-58.

Setiawan, E. B. (2025). Prinsip Konstitusi Ekonomi Dalam Hilirisasi Nikel Untuk Mewujudkan Pengelolaan Sumber Daya Alam Yang Berkelanjutan. Jurnal Rechts Vinding: Media Pembinaan Hukum Nasional, 114.

Simanjuntak, I. N. (2025). Hilirisasi, Korporasi, Dan Krisis Ekologi: Menata Ulang Hukum Bisnis Kontemporer Di Kepulauan Raja Ampat. Jurnal Pendidikan Sejarah Dan Riset Sosial Humaniora, 311-324.

Wasis, B. (2024). Pertambangan, Hilirisasi Industri, Kerusakan Lingkungan Hidup Dan Pembangunan Berkelanjutan. Research Gate, 112.

Widyaningrum, T. A. (2024). Pembaruan Hukum Pertambangan Mineral Dan Batubara Menuju Keadilan Dan Kepastian Hukum Yang Berkelanjutan Untuk Masyarakat Indonesia. Iblam Law Review, 11-22.