



2.º CONGRESO
CIERRE DE
MINAS
PERÚ 2026



REPORT 2026

23 & 24 APRIL 2026

COUNTRY CLUB LIMA HOTEL



INTEGRATED, CIRCULAR,
SUSTAINABLE PROJECT
MANAGEMENT WITH A
POSITIVE LEGACY





2.º CONGRESO CIERRE DE MINAS PERÚ 2026

The 2nd Mine Closure Peru 2026 Congress brought together a technical community committed to promoting a new perspective on mine closure: earlier, more comprehensive, collaborative and focused on generating a positive legacy.

From DEEV, we thank the Steering and Advisory Committees, speakers, sponsors, partners, and participants who made this second edition possible. Their commitment helped consolidate a high-value technical dialogue space for Peruvian and regional mining.

This report brings together the main moments, lessons learned, and contributions from an event that reaffirms the importance of planning closure with a long-term vision, responsibility, and joint work.

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The 2nd Mine Closure Peru 2026 Congress consolidated a unique technical space in the country to address the main challenges and evolving demands of comprehensive, sustainable, long-term mine closure management.

Under the theme "Integrated, circular, sustainable project management with a positive legacy," this second edition brought together specialists, authorities, mining companies, consulting firms, technology partners, and key institutions, creating an exchange space focused on sharing experiences, best practices, and solutions for more responsible mining.

Through conferences, technical presentations, case studies, and discussion panels, the program addressed essential topics such as early planning, governance, financial assurance, water management, physical and geochemical stability, environmental remediation, circular economy, future land use and the application of new technologies.

The Congress reaffirmed that mine closure should not be understood as a final stage, but rather as a strategic process that must be integrated from the design, operation, and business planning of the mining operation. In this regard, the participation of the Steering and Advisory Committees was key to building a well-structured agenda connected to the industry's current challenges and oriented toward a planned transition to closure and post-closure.

Organized by DEEV, the 2nd Mine Closure Peru 2026 Congress marked a new milestone for the sector, reaffirming the importance of responsible and sustainable closure as an essential part of mining with a positive legacy for Peru and the region.

Professional Profile

46%

CEOs, VPs, Directors,
Managers, Assistant Managers

34%

Superintendents,
Team Leaders, Area Heads

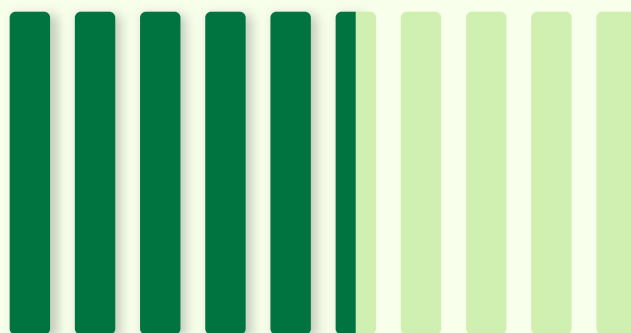
20%

Technical professionals
and consultants

Company Profile

56,6%

of attendees work
in mining companies



2026 Edition

550
ATTENDEES

29 TECHNICAL PRESENTATIONS

5 KEYNOTE
SPEAKERS

3 DISCUSSION
PANELS



The 2nd Mine Closure Peru 2026 Congress opened with remarks by Fabiola Sifuentes, Vice President of Planning and Environmental Strategy at Compañía Minera Antamina and President of the Congress, who welcomed authorities, industry leaders, specialists, mining companies, consultants, academic and strategic partners gathered around more sustainable, comprehensive, long-term mine closure management.

“ **Mine closure can no longer be understood as a final stage, nor merely as compliance with a regulatory obligation. It is a strategic process, embedded across the business, that begins from the very design of the operation.** ”

During her address, she emphasized that mine closure must build trust, ensure sustainability, and create a real legacy for territories, communities and ecosystems. She also recalled that the first edition helped consolidate a comprehensive and interdisciplinary vision of closure, while this second edition posed the challenge of moving from plans to action, transforming individual efforts into collective impacts.

Finally, she highlighted the importance of analyzing specific cases, closing governance gaps, and articulating closure decisions within the mining business strategy. Along these lines, she invited participants to actively engage in the sessions, panels, conversations, and the "MINA DE IDEAS" dynamic.

“ **Mine closure is not built in silos. It is built through dialogue, collaboration, and, above all, trust.** ”

Fabiola Sifuentes
President of the Congress
Mine Closure Peru 2026

We extend special thanks to the Steering Committee, composed of outstanding professionals from the mining industry, whose experience, strategic vision, and commitment were fundamental in guiding the development of this edition. Their contribution made it possible to build an agenda aligned with the sector's main challenges, promoting a comprehensive view of mine closure, from early planning to the generation of a positive legacy.



PRESIDENT

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Vicepresidenta de Planificación
y Estrategia Ambiental
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**VOLCAN COMPAÑÍA
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Gerente de Medio Ambiente,
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**MINERA BOROO
MISQUICHILCA**



MICHAEL RAMÍREZ

Principal Advisor
Permitting &
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KARLA ORTEGA

Jefe Corporativo de
Medio Ambiente a Cargo
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NEXA RESOURCES



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Jefe de Permisos
MINERA BATEAS



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Ingeniero Ambiental Senior
de Planificación y Gestión
de Cierre
**COMPAÑÍA MINERA
ANTAMINA**



JUAN CARLOS ALCAS

Superintendente de
Medio Ambiente
**COMPAÑÍA MINERA
MISKI MAYO**

We extend special thanks to the Advisory Committee, composed of specialists with recognized experience, who contributed their technical judgment, expertise, and knowledge to strengthen the quality of the program. Their participation was key to enriching the content, validating the proposed approaches, and ensuring that this second edition responds to the real and current needs of the industry.



GISELLE VERA
Mine Closure Practice
Lead
AUSENCO



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Ingeniero Especialista en
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UNIVERSIDAD DE CHILE

WE EXTEND SPECIAL THANKS TO OUR KEYNOTE SPEAKERS FOR GENEROUSLY SHARING THEIR VISION, GLOBAL KNOWLEDGE, AND APPLIED EXPERIENCE IN THIS EDITION.

Their presentations enriched the technical program with risk-based planning, cost estimation, geomorphic restoration, and new paradigms to move toward responsible, more sustainable closure with a positive legacy.



**JOSÉ F.
MARTÍN**

Professor of
Geomorphology,
Faculty of Geological
Sciences

**UNIVERSIDAD
COMPLUTENSE
DE MADRID**



**LISA
MAY**

Senior Principal,
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**DAWN
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Senior
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STANTEC



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Director &
Principal Closure /
Rehabilitation

**UNEARTHED
ENVIRONMENTAL
SERVICES**

SPONSORS



2.º CONGRESO
CIERRE DE
MINAS
PERÚ 2026



We extend special thanks to the sponsoring companies for their trust and commitment to the objectives achieved in this edition. Their support was key to consolidating a high-level technical space focused on sharing knowledge, promoting collaboration, and strengthening a more responsible, sustainable vision of mine closure with a positive legacy for the sector.

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CELEDONIO ARANDA

Senior Environmental
Engineer for Closure
Planning and
Management

**COMPAÑÍA MINERA
ANTAMINA**

“APPLICABLE COLLABORATIVE RESEARCH FOR CLOSURE. LESSONS LEARNED IN ANTAMINA”

“INVESTIGACIÓN COLABORATIVA APLICADA AL CIERRE.
LECCIONES APRENDIDAS EN ANTAMINA”

The presentation highlighted geochemical and hydrological stability management at Antamina, addressing waste rock variability and drainage uncertainty. It explained the research program developed with the University of British Columbia and Teck Resources Limited, which included testing, experimental piles, and modeling. The results made it possible to optimize material placement, improve water quality predictions, and design efficient covers to reduce environmental risks.

“MULTICRITERIA EVALUATION OF COVER ALTERNATIVES FOR MINE CLOSURE USING THE AHP PROCESS”

“EVALUACIÓN MULTICRITERIO DE ALTERNATIVAS DE
COBERTURA PARA CIERRE DE MINAS MEDIANTE EL PROCESO
AHP”

The presentation applied the AHP method within a multicriteria approach to evaluate cover alternatives for tailings with acid drainage potential. It integrated technical, environmental, social, and economic criteria, combining quantitative data and expert judgment. It identified the most efficient options as those using geosynthetics and low-permeability materials. It also validated the robustness of the model through consistency and sensitivity analyses, demonstrating its usefulness for optimizing closure decisions.



MARCO GRECO

Eng. (It), MSc,
Regional Mine
Closure Lead - South
America

HATCH

PROF. JOSÉ FRANCISCO MARTIN DUQUE

Professor of Geomorphology,
Faculty of Geological Sciences

**UNIVERSIDAD COMPLUTENSE
DE MADRID (UCM)**



“BENEFITS OF GEOMORPHIC RESTORATION IN MINE REHABILITATION AND CLOSURE”

“BENEFICIOS DE LA RESTAURACIÓN GEOMORFOLÓGICA
EN LA REHABILITACIÓN Y CIERRE DE MINAS ”



The presentation analyzed geomorphic regrading as an alternative to traditional mine closure, highlighting advantages in integration with the surrounding environment, greater resistance to water erosion, and improved social acceptance. It noted that the conventional approach, although efficient and stable, has environmental and social limitations. It also reviewed the benefits, challenges, and current international status of these techniques, including examples applied in different countries.



**GISELLE
VERA**

Mine Closure
Practice Lead

AUSENCO

“CLOSURE FROM DAY ONE: STRATEGIC ESTIMATION OF CONCEPTUAL COSTS FOR SUSTAINABLE MINE CLOSURE”

“CIERRE DESDE EL DÍA UNO: ESTIMACIÓN ESTRATÉGICA DE
COSTOS CONCEPTUALES PARA UN CIERRE SOSTENIBLE”

The presentation developed a methodology for estimating closure and post-closure budgets in the early stages of mining projects, based on applied experience. It proposed two conceptual approaches that improve initial planning. It also highlighted that the model integrates technical, environmental, and social criteria, aligning with international standards and strengthening transparency, due diligence, and responsible management through proper estimation of remediation and long-term monitoring costs.

“APPLIED DIGITAL REALITY: INTEGRATION OF MULTIDIMENSIONAL DATA FROM OPERATION TO RESTORATION”

“REALIDAD DIGITAL APLICADA: INTEGRACIÓN DE DATOS
MULTIDIMENSIONALES DESDE LA OPERACIÓN HASTA LA
RESTAURACIÓN”

The presentation introduced a digital solution to integrate continuous environmental monitoring in mining in response to increased biodiversity-related requirements. It explained the combined use of remote and in-situ technologies within a platform that organizes ecological data spatially and temporally. It showed cases in Brazil where the baseline, communication, and closure management were improved. It also highlighted its contribution to transparency, decision-making, and operational scalability.



**SEBASTIAN
TELLO**

Business
Development
Manager, Andean
Region

**HEXAGON |
R-EVOLUTION**

CERREJÓN EXPERIENCES IN MINE CLOSURE



**JUAN PABLO
LOZANO**

Environmental
Management Manager

**CERREJÓN
COLOMBIA**

“INTEGRATED ANALYSIS OF HYDROLOGICAL DYNAMICS IN MINE WASTE DUMPS: IMPLICATIONS FOR STABILITY AND CLOSURE – THE CASE OF CERREJÓN (COLOMBIA)”

“ANÁLISIS INTEGRADO DE LA DINÁMICA HIDROLÓGICA EN
BOTADEROS MINEROS: IMPLICACIONES PARA LA
ESTABILIDAD Y EL CIERRE. EL CASO DE CERREJÓN
(COLOMBIA)”

The presentation highlighted the importance of water management in mine waste dumps to ensure their stability during operation and closure. It explained the role of hydrology in long-term behavior, emphasizing runoff control, watershed reshaping, and channel protection. It also highlighted that sustainable drainage systems help reduce structural risks and preserve water quality, avoiding acidification processes and sediment inputs.

“LANDFORMS, HYDROLOGY, AND EROSION: KEY ASPECTS OF MINE CLOSURE – THE CASE OF CERREJÓN (COLOMBIA)”

“GEOFORMAS, HIDROLOGÍA Y EROSIÓN. ASPECTOS CLAVE DE
LOS CIERRES MINEROS. EL CASO DE CERREJÓN (COLOMBIA)”

The presentation addressed comprehensive mine closure planning, highlighting the interaction between landforms, hydrology, and erosion processes as pillars of post-mining sustainability. It explained that landform design should imitate natural conditions, with gentle slopes and geomorphic stability. It also emphasized that proper integration of these elements improves drainage, reduces erosion, enhances ecological recovery, and contributes to landscape resilience and the socio-environmental value of the territory.



**ÁLVARO
GÓMEZ**

Superintendent of
Biodiversity,
Rehabilitation, and
Environmental
Offsets

**CERREJÓN
COLOMBIA**



JUAN CASTRO

Environmental
Engineer for Operations
and Closure

**COMPAÑÍA MINERA
ANTAPACCA**

“BIOLOGICAL RECOVERY OF FLORA AND FAUNA FOLLOWING THE PROGRESSIVE CLOSURE OF THE HUINIPAMPA DAM: ANTAPACCA'S CASE”

“RECUPERACIÓN BIOLÓGICA DE FLORA Y FAUNA TRAS EL
CIERRE PROGRESIVO DE LA PRESA HUINIPAMPA: CASO
ANTAPACCA”

The presentation evaluated progressive closure at Antapaccay through an integrated approach to physical stability, geochemical behavior, and biological recovery in the Central Waste Dump and the Huinipampa deposit. It demonstrated stable conditions with no instability risks and adequate hydrological control. It also showed progressive ecological recovery with increased biodiversity, highlighting that system stability makes it possible to restore functional habitats and consolidate sustainable closure processes.

“INFLUENCE OF PERMITS ON TECHNICAL AND FINANCIAL DECISIONS AT MINE CLOSURE: CASE STUDIES”

“INFLUENCIA DE LOS PERMISOS EN LAS DECISIONES
TÉCNICAS Y FINANCIERAS DEL CIERRE:
PRESENTACIÓN DE CASOS”

The presentation examined mine closure regulation in Latin America, with emphasis on Peru and Chile, analyzing the interaction between permits, plans, and closure projects. It identified limitations arising from measures poorly aligned with risks, information gaps, and unrealistic cost estimates. It also presented cases where these factors affect long-term planning and proposed alternatives to improve mine closure management and effectiveness.



JORGE CAMPOS

Mine Closure
Principal
ANDDES



MARCELO ROBLEDO

Closure Programs
Manager

**NEWMONT
YANACocha**

FEATURED PRESENTATION

“LONG-TERM WATER MANAGEMENT WITH A SOCIAL FOCUS: NEW WATER TREATMENT PLANTS AND THE “WATER FOR CAJAMARCA” PROGRAM”

“GESTIÓN DEL AGUA EN EL LARGO PLAZO CON ENFOQUE
SOCIAL: NUEVAS PLANTAS DE TRATAMIENTO DE AGUA Y
PROGRAMA “AGUA PARA CAJAMARCA”



AUGUSTO URTEAGA

Mine Closure
Planning
Superintendent

**NEWMONT
YANACocha**

The presentation highlighted water management as a core element of sustainable closure at Yanacocha, describing the design of two treatment plants with a total capacity of 6,000 m³/h for closure and post-closure stages. It noted their construction and future operation in 2027. It also highlighted complementary initiatives such as tube wells and reservoirs, in coordination with authorities, aimed at reducing the water deficit and strengthening the positive impact of mine closure.



**JESSICA
NICHOLLS**

Senior Manager -
Environment

ICMM

“ADVANCING RESPONSIBLE CLOSURE THROUGH THE CONSOLIDATED MINING STANDARD INITIATIVE”

“IMPULSANDO EL CIERRE RESPONSABLE A TRAVÉS DE LA
INICIATIVA DE ESTÁNDAR MINERO CONSOLIDADO (CMSI)”

The presentation addressed the development of a consolidated global standard for responsible mining promoted by ICMM in response to increasing ESG requirements and greater scrutiny. It explained how the CMSI initiative seeks to reduce fragmentation, align expectations, and strengthen credibility through a multi-stakeholder approach. It also described its structure, with requirements at the corporate and facility levels, promoting integrated planning, responsible closure, and greater transparency throughout the mining value chain.

“REMEDIATION OF 90 MINING ENVIRONMENTAL LIABILITIES AT THE FORMER CARIDAD MINING UNIT (PERU) UNDER THE INTERNATIONAL STANDARD ISO 24419-1”

“REMEDIACIÓN DE 90 PASIVOS AMBIENTALES MINEROS EN LA
EX UNIDAD MINERA CARIDAD (PERÚ) BAJO EL ESTÁNDAR
INTERNACIONAL ISO 24419-1”

The presentation described AMSAC’s Caridad Project, focused on the implementation of ISO 24419-1 for mine closure and recovery. It showed how the management of environmental liabilities can be aligned with international quality standards. It also demonstrated that remediation reduces risks and creates social, environmental, and economic value, positioning Peru as a regional benchmark in sustainable mine closure.



**MIGUEL
TITO**

Head of Planning
and Continuous
Improvement

ACTIVOS MINEROS

DR. BJORN WEEKS

Director, Closure

TECK RESOURCES



“MINE CLOSURE AT TECK: PLANNING, EXECUTION AND PERFORMANCE”

**“CIERRE DE MINAS EN TECK: PLANIFICACIÓN,
EJECUCIÓN Y DESEMPEÑO”**

The presentation described Teck Resources' approach to mine closure planning and execution, based on more than a century of experience. It presented lessons learned from monitoring closed sites and recent cases of successful closure, highlighting how these lessons are integrated from the early stages of the mining cycle, including projects such as Zafrañal, within a sustainable mining strategy.





**NURIA
APAIZA**

Closure Management
Lead

LARA CONSULTING

“HYDROCHEMICAL CONTROL STRATEGIES FOR TAILINGS CLOSURE: LESSONS FROM GLOBAL REGULATIONS AND GUIDELINES”

“ESTRATEGIAS DE CONTROL HIDROQUÍMICO PARA EL
CIERRE DE RELAVES: LECCIONES DE NORMATIVAS Y
GUÍAS GLOBALES”



**ROSA
OVIEDO**

Mining Waste
Lead

LARA CONSULTING

The presentation examined hydrochemical stability as a central element of sustainable tailings closure, integrating international standards and best practices. It addressed the generation and control of acid drainage, the use of barriers, predictive modeling, and adaptive monitoring. It also incorporated global experiences in passive solutions and highlighted innovations such as reactive materials, optimized covers, continuous sensors, and artificial intelligence-based tools to improve long-term management.



**GUSTAVO
FIERRO**

Corporate R&D
Manager in
Geosynthetics

TDM

“STABILITY OF MINE CLOSURE COVERS USING VEGETATIVE SPECIES AND GEOSYNTHETICS”

“ESTABILIDAD DE COBERTURAS DE CIERRE DE MINAS CON
ESPECIES VEGETATIVAS Y GEOSINTÉTICOS”

The presentation described the use of closure covers with geosynthetics as an efficient and sustainable alternative to traditional solutions. It developed a methodology that incorporates the contribution of vegetative species to long-term stability, analyzing the role of root systems as geotechnical pseudo-cohesion. It also integrated the use of degradable geosynthetics and biotechnology, supporting the approach with applied examples that strengthen the sustainability and reliability of closure covers.

“COMPREHENSIVE MINE CLOSURE PROJECT: MANAGEMENT MODEL FOR THE VIABLE IMPLEMENTATION OF A MINING OPERATION CLOSURE”

“PROYECTO INTEGRAL DE CIERRE MINERO: MODELO DE
GESTIÓN PARA UNA IMPLEMENTACIÓN VIABLE DEL
CIERRE DE UNA OPERACIÓN MINERA”

The presentation proposed a management approach to mine closure as a comprehensive business project, moving beyond a late-stage approach focused only on design and compliance. It explained its integration from early stages and its progressive development, addressing technical, operational, and social dimensions. It also highlighted improvements in executability, study maturity, and cost predictability, positioning it as a replicable practice to reduce risks and preserve value at closure.



**CLAUDIO
BALLON**

Project Manager

MINSUR



**CLAUDIO
FLORES**

People and Safety
Manager

**CODELCO - DIV.
VENTANAS**

“VENTANAS SMELTER CLOSURE PROJECT: SUSTAINABILITY, SOCIAL LEGITIMACY, AND INNOVATION OPPORTUNITIES FOR THE MINING INDUSTRY”

**“PROYECTO DE CIERRE DE FUNDICIÓN VENTANAS:
SUSTENTABILIDAD, LEGITIMIDAD SOCIAL Y OPORTUNIDADES
DE INNOVACIÓN PARA LA INDUSTRIA MINERA”**

The presentation described the early closure of Codelco’s Ventanas Smelter, decided in 2022 after decades of operation in Puchuncaví. It highlighted operational, social, and environmental challenges, as well as the process to achieve closure with legitimacy and excellence. It also showed how this decision opened opportunities to redefine the division’s strategic role through an innovative, sustainable approach oriented toward new business models.

“DELTA UPAMAYO CASE: OVERCOMING CHALLENGES IN MINE CLOSURE THROUGH ENGINEERING AND PRESERVATION OF THE PERUVIAN HIGH-ANDEAN ECOSYSTEM”

**“CASO DELTA UPAMAYO: SUPERANDO RETOS EN CIERRE DE
PASIVOS MINEROS CON INGENIERÍA Y PRESERVACIÓN DEL
ECOSISTEMA ALTOANDINO PERUANO”**

The presentation presented the closure design for the Delta Upamayo in Pasco, focused on reducing risks in a dynamic fluvial-lacustrine system affected by historical sedimentation. It described a methodology based on comprehensive characterization and zoning of the area. The solutions included sediment removal, soil neutralization, revegetation, and erosion control. It also emphasized that long-term performance depends on the integration of design, execution, and monitoring.



**HÉCTOR
MELÉNDEZ**

Project Chief

CESEL

LISA MAY

Senior Principal, Mine Closure
and Reclamation Specialist

WSP



“MINE CLOSURE USING RISK- BASED PLANNING”

**“PLANIFICACIÓN DEL CIERRE CON ENFOQUE
BASADO EN RIESGOS”**

The presentation addressed mine closure as a process that balances the expectations of regulators, communities, Indigenous peoples, and companies, ensuring technical feasibility and long-term sustainability. It emphasized that success depends on identifying risks and opportunities, allocating resources strategically, and making transparent decisions. It also noted that risk-based planning promotes collaboration and realistic closure criteria, strengthening process efficiency and the transition of the asset.





**FIGURELLA
MALÁSQUEZ**

Director of the
Environmental
Assessment Directorate
for Natural Resource
and Productive Projects
SENACE

“ADVANCES IN ENVIRONMENTAL ASSESSMENT IN PERU”

“AVANCES DE LA EVALUACIÓN AMBIENTAL EN EL PERÚ”

The presentation described SENACE’s functions in the assessment of projects and mine closure plans, including the review of EIAs, administration of records and environmental certifications, and technical assistance to mining operations. It also highlighted its citizen participation and conflict-prevention actions between 2025 and 2026. Finally, it presented its vision for 2030, focused on environmental certification, technological innovation, digital transformation, and the strengthening of efficient and sustainable public management.

“EVOLUTION OF WATER QUALITY IN AN INADEQUATE MATERIAL DEPOSIT DURING CLOSURE AND POST-CLOSURE STAGES: CASE STUDY AT MINERA LA ZANJA”

“EVOLUCIÓN DE LA CALIDAD DE AGUA EN UN DEPÓSITO DE
MATERIAL INADECUADO EN ETAPAS DE CIERRE Y
POST-CIERRE: CASO DE ESTUDIO EN MINERA LA ZANJA”

The presentation evaluated the evolution of subdrainage from the Turmalina DMI during closure and post-closure, showing improvements in pH, conductivity, and sulfates, as well as reductions of several metals to regulatory levels. However, other parameters still exceed limits, with decreasing trends that project long stabilization periods. It also highlighted that the implemented measures reduce the contaminant load, but require extended treatment and modeling to manage uncertainty.



**GABRIELA
PALOMINO**

Environmental
Project Chief

**COMPAÑIA
DE MINAS
BUENAVENTURA**



**HOMERO
MEJÍA**

Executive
Environmental
Specialist II

OEFA

“ENVIRONMENTAL ENFORCEMENT IN THE MINE CLOSURE STAGE”

“FISCALIZACIÓN AMBIENTAL EN LA ETAPA DE
CIERRE DE MINAS”

The presentation explained the importance of the mine closure stage to ensure long-term physical, geochemical, and hydrological stability, as well as environmental recovery. It detailed OEFA’s role in supervising and verifying compliance with closure plans. It also presented difficulties identified in real cases, providing lessons to strengthen mine closure planning, execution, and control.



**JOSÉ
FARFÁN**

Activity
Coordinator
OEFA



**GABRIELA
PALOMINO**

Environmental
Project Chief

**COMPAÑIA DE MINAS
BUENAVENTURA**

**APPLIED RESEARCH ACHIEVING PARTNERSHIPS
BETWEEN COMPANY AND RESEARCH CENTER**

“IMPLEMENTATION OF NATIVE MICROBIAL CONSORTIA FOR THE OPTIMIZATION OF CLOSURE COVERS AND PREVENTION OF ACID MINE DRAINAGE: CASE STUDY AT MINERA LA ZANJA”

**“IMPLEMENTACIÓN DE CONSORCIOS MICROBIANOS
NATIVOS PARA LA OPTIMIZACIÓN DE COBERTURAS DE
CIERRE Y PREVENCIÓN DE DAM: CASO MINERA LA ZANJA”**



**KARINA
ZAPATA**

Researcher
INCABIOTEC

The presentation addressed bioremediation at Minera La Zanja through the use of native microorganisms to improve vegetation cover and reduce acid drainage. It identified efficient microbial consortia using molecular techniques and validated their application in the field. It also highlighted large-scale production using molasses as a circular economy model, demonstrating a viable, cost-effective, and scalable solution to optimize closure covers.



**MICHEL
CHAIT**

General Manager

FLESAN MINERÍA

“MASS DEMOLITION METHODOLOGY: TRANSFORMING THE TRADITIONAL METHOD TO OPTIMIZE COSTS AND EXECUTION TIME”

“METODOLOGÍA DE DEMOLICIÓN MASIVA: TRANSFORMANDO
EL MÉTODO TRADICIONAL PARA OPTIMIZAR COSTOS Y
TIEMPOS DE EJECUCIÓN”

The presentation described a mass demolition methodology applied to mine closure, differentiating dismantling, decommissioning, and demolition. It developed an approach based on risk management, sustainability, environmental setting analysis, and strategic planning with 3D support. It detailed techniques such as shear cutting, diamond wire cutting, and controlled blasting. It also showed results in high-mountain environments with significant reductions in risks, timelines, and costs, optimizing mine closure execution.

“EXPERIENCE AND OPPORTUNITIES IN TAILINGS REMOVAL AND REUSE FOR CLOSURE PLAN MANAGEMENT AT CODELCO”

“EXPERIENCIA Y OPORTUNIDADES EN REMOCIÓN Y
REUTILIZACIÓN DE RELAVES PARA GESTIÓN DE PLANES
DE CIERRE DE CODELCO”

The presentation addressed Codelco's transformation process to ensure sustainable long-term production through investments that secure its future operation. It highlighted the challenge posed by historical tailings in mine closure and the opportunities for their removal and reuse. It also presented applied techniques and lessons learned over more than 20 years, oriented toward more sustainable solutions for the mining industry.



**HUMBERTO
RIVAS**

Corporate
Environmental
Manager

CODELCO

DAWN GARCIA

Senior Associate, Hydrogeologist

STANTEC



“REALITY CHECK: DEVELOPING CLOSURE COSTS THAT WORK”

“REALITY CHECK: DESARROLLANDO COSTOS DE
CIERRE QUE FUNCIONEN”

The presentation addressed the difficulties involved in estimating mine closure costs, highlighting the gap between conceptual designs and real data. It identified problems such as limited information, incorrect assumptions, and the use of generalized criteria that do not consider the uniqueness of each site. It also presented common mistakes and proposed practical strategies to generate more realistic, defensible estimates aligned with project needs.





EDMUNDO DEL PINO

Corporate
Deputy Manager,
Mine Closure

**VOLCAN COMPAÑÍA
MINERA**

“FROM TAILINGS TO RESOURCE: CIRCULAR ECONOMY STRATEGIES IN THE CLOSURE OF VOLCAN MINING COMPANY FACILITIES”

“DEL RELAVE AL RECURSO: ESTRATEGIAS DE ECONOMÍA
CIRCULAR EN EL CIERRE DE INSTALACIONES MINERAS DE
COMPAÑÍA MINERA VOLCAN”

The presentation analyzed the reuse of the San Nicolás tailings deposit as a circular economy strategy based on repulping and reincorporating materials into the mining process. It explained that this initiative, integrated into Volcan Compañía Minera’s closure plan, not only generates economic benefits but also reduces socio-environmental risks associated with conventional tailings facility closure. It also highlighted how closure can be transformed into an opportunity for sustainability, resource recovery, and long-term value generation.

“CHALLENGES IN THE MAINTENANCE OF WETLANDS FOR THE TREATMENT OF MINING EFFLUENTS”

“DESAFÍOS EN EL MANTENIMIENTO DE WETLANDS PARA EL
TRATAMIENTO DE EFLUENTES MINEROS”

The presentation addressed the maintenance challenges of wetlands used for mine water treatment, highlighting problems such as clogging caused by metals, acidity, and solids. It presented two cases in South and North America where hydraulic control and vegetation removal were key to system efficiency. It also underlined the importance of monitoring critical parameters, proposing the study as a reference for operations with similar conditions and optimization needs.



MARIA BORJA

Senior Lead Water
Treatment Engineer

WSP - USA



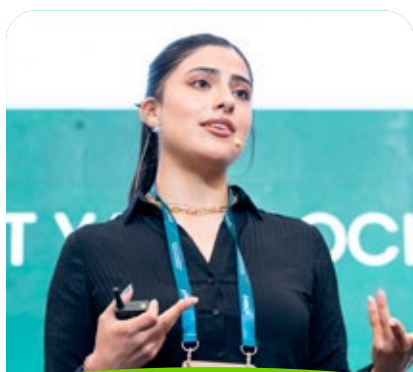
MARCELO ROBLEDO

Closure Programs
Manager

**NEWMONT
YANACOCOA**

“APPLICATION OF TECHNOLOGY FOR MONITORING REHABILITATED AREAS: USE OF DRONES AND MULTISPECTRAL CAMERAS AT YANACOCOA”

“APLICACIÓN DE TECNOLOGÍA PARA EL MONITOREO
DE ÁREAS REHABILITADAS: USO DE DRON MÁS
CÁMARA MULTIESPECTRAL EN YANACOCOA”



NATALIA AVELLANEDA

Rehabilitation
Monitoring Engineer

**NEWMONT
YANACOCOA**

The presentation introduced an innovation at Yanacocha based on drones equipped with multispectral cameras to monitor rehabilitated areas during post-closure. It explained that this technology makes it possible to assess large revegetated areas, identify performance variability, and analyze the behavior of species. It also noted that the information obtained facilitates the generation of plans and the execution of more precise, timely, and focused maintenance plans to improve the efficiency of the rehabilitation process.

DR. CARL GRANT

Director & Principal Closure |
Rehabilitation

**UNEARTHED ENVIRONMENTAL
SERVICES**

"MINE CLOSURE PARADIGMS: IT'S TIME TO SHIFT THE GOAL POSTS"

**"PARADIGMAS DEL CIERRE DE MINAS: ES MOMENTO DE
REDEFINIR LAS REGLAS DEL JUEGO"**

The presentation questioned mine closure paradigms developed over decades, such as the "cradle-to-grave" approach and the need for exhaustive studies or higher standards. It proposed a shift toward models integrated into the mine life cycle and focused on execution. It emphasized that the main gaps are not technical, but rather related to resources, internal responsibility, and a multidisciplinary approach to achieving effective closures.





HELMER VÁSQUEZ

Biodiversity and
Closure Supervisor

ANGLO AMERICAN

“BEYOND CLOSURE: TECHNOLOGY CONNECTING RESTORED SEMI-ARID ECOSYSTEMS WITH PROTECTED WILDLIFE”

“MÁS ALLÁ DEL CIERRE: TECNOLOGÍA QUE CONECTA
ECOSISTEMAS SEMIÁRIDOS RESTAURADOS CON LA FAUNA
SILVESTRE PROTEGIDA”

The presentation presented ecological restoration at the Quellaveco mine, located in an extreme semi-arid environment in Moquegua, with a desert climate, soils without organic matter, and scarce vegetation. It described additional challenges such as the presence of the critically endangered guanaco. It detailed scientific strategies for native species propagation and fauna studies, demonstrating that restoration is viable through innovation, applied knowledge, and sustained environmental commitment.

“DISCRIMINATION AND RISK FACTORS FOR SELECTING FUTURE LAND-USE ALTERNATIVES IN MINE CLOSURE”

“FACTORES DE DISCRIMINACIÓN Y DE RIESGO PARA ELEGIR
ALTERNATIVAS DE USO FUTURO EN CIERRE DE MINAS”

The presentation addressed the incorporation of future land-use studies into closure plans, aligned with Peruvian regulations and ESG criteria. It presented a matrix-based methodology that integrates risk and feasibility factors to define post-mining uses. It considered environmental, social, legal, and economic variables. It also showed its application in two operations, demonstrating how this tool contributes to social acceptance, risk reduction, and long-term sustainable development.



OSVALDO ADUVIRE

Practice Leader and
Principal Consultant

SRK CONSULTING



**EDWIN
ZEGARRA**

Environmental, Water
and Tailings Manager

**GOLD FIELDS
LA CIMA**

FEATURED PRESENTATION

“INTEGRATED PLANNING OF THE MINE CLOSURE PROCESS AT CERRO CORONA”

“PLANIFICACIÓN INTEGRAL DEL PROCESO DE CIERRE DE MINAS
EN CERRO CORONA”

The presentation introduced the approach applied at Cerro Corona for comprehensive mine closure planning, based on a structured flow that ranges from the generation of baseline information and the definition of future land uses to strategies, designs, validations, and economic estimates. It highlighted its alignment with ICMM standards and national regulations, ensuring coherence among technical, environmental, social, and governance dimensions.

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AND PRESENTATIONS**





“HOW CAN WE LEAVE A POSITIVE LEGACY?”

“¿CÓMO LOGRAMOS UN LEGADO POSITIVO?”

MODERATOR



PETER WHITBREAD-ABRUTAT

Founder & Director

**FUTURE TERRAINS
INTERNATIONAL**

PANELISTS



MALCOLM GALLARDO

Environmental & Mine Closure
Technical Director

**COMPAÑÍA DE MINAS
BUENAVENTURA**



PAOLO PUGGIONI

Environmental Mine Closure, Lead

AUSENCO



GIOVANNA HUANHEY

Environmental & Permitting
Manager

MINERA LAS BAMBAS



JORGE LUIS CARRANZA

VP (i) & Project Development Director

MINERA CHINALCO PERÚ

The panel addressed the concept of a "positive legacy" in mine closure, highlighting that it implies not only environmental stability, but also social, economic, and governance benefits that are sustainable over time. The participants discussed the importance of planning closure from the earliest stages of operation, actively involving communities and authorities, and promoting new productive uses for mining infrastructure and waste. They also emphasized the need for financing, innovation, and circular economy to ensure sustainable transitions after the end of mining activity.

“INTEGRATED VISION OF SOCIAL AND SUSTAINABLE CLOSURE ALIGNED WITH BUSINESS STRATEGY”

“VISIÓN INTEGRAL DEL CIERRE SOCIAL Y SOSTENIBLE ALINEADA CON LA
ESTRATEGIA DE NEGOCIO”

MODERADOR



JOHANNA ILLANES

Senior Corporate
Environmental Auditor

**SOCIEDAD MINERA
CERRO VERDE**

PANELISTAS



ERIKA CALMELL DEL SOLAR

Environmental Planning
Manager

**COMPAÑÍA MINERA
ANTAMINA**



PERCY MONTOYA

Environmental Management Manager

**COMPAÑÍA DE MINAS
BUENAVENTURA**



EDUARDO SERPA

National External Affairs
Manager

ANGLO AMERICAN



JORGE SOTO

President, Mining Chapter - CIP Lima;
**Former Director General of the General
Directorate of Mining - MINEM**

MINEM

The panel addressed the integration of social and sustainable closure within the mining business strategy, highlighting that closure must be planned from the beginning of the operation. The participants emphasized the importance of senior management, governance, and multi-stakeholder work to reduce social gaps and generate sustainable territorial development. They also discussed opportunities for post-mining use, tourism, agroindustry, and works-for-taxes projects, as well as the need to strengthen standards, indicators, and regulatory frameworks to ensure sustainable closures with a positive legacy.



“CHALLENGES IN CLOSURE ORGANIZATION AND GOVERNANCE: INTEGRATION INTO BUSINESS STRATEGY, RESOURCE ASSURANCE, AND POSITIVE LEGACY”

“DESAFÍOS EN LA ORGANIZACIÓN Y GOBERNANZA DEL CIERRE: INTEGRACIÓN A LA
ESTRATEGIA DE NEGOCIO, ASEGURAMIENTO DE RECURSOS Y LEGADO POSITIVO”



MODERADOR

YURI GALLO

Vice President of Projects

MINSUR

PANELISTAS



PAUL GÓMEZ

Senior Vice President
and General Manager

GOLD FIELDS LA CIMA



FABIOLA SIFUENTES

Vice President of Planning
and Environmental Strategy

**COMPAÑÍA MINERA
ANTAMINA**



GLADYS RUIZ

Vice President of Safety,
Health and Environment

MINERA LAS BAMBAS



ADRIANA AURAZO

VP of Environmental, Social,
and Sustainability Affairs

**COMPAÑÍA MINERA
CONDESTABLE**

The panel discussed the need to incorporate mine closure from the initial stages of planning and operation, integrating it into strategy, risk management, and corporate decision-making. It was emphasized that closure should not be understood only as regulatory compliance, but as a complex process involving sustainability, water treatment, technological research, social management, and long-term economic planning. The importance of developing standards, organizational leadership, and a positive legacy for communities and the environment after mining activity was also emphasized.

During the 2nd Mine Closure Congress, we developed the "MINA DE IDEAS" dynamic, a participatory space created to transform the attendees' technical experience into concrete proposals to address the main challenges of mine closure and post-closure.

The dynamic was led by Adriana Aurazo, a member of the Steering Committee, with support from other committee leaders. Representatives from mining companies, consulting firms, standards and regulatory bodies, and academia participated, generating a high-value multidisciplinary conversation.

Through five thematic challenges, the teams worked collaboratively on proposals aimed at strengthening a vision of closure as a comprehensive, circular, sustainable process with a positive legacy. Each group developed its ideas in working spaces within the congress program and then presented them to all attendees.

The dynamic culminated in a vote in which the purple team was chosen as the winner with the challenge "R&D for the Future."



R&D FOR THE FUTURE

CHALLENGE:

How do we strengthen R&D to promote technical standards, circular economy, waste valorization, and financing?

The purple team, winner of the dynamic, proposed strengthening research and development as a driver to accelerate the solutions required for the mine closure of the future.

Their approach focused on the need to bring innovation into the field through in-situ laboratories, applied pilots, and technical validation spaces that enable faster decision-making and the generation of solutions with technical, environmental, and economic value.

The team also highlighted the importance of coordinating efforts among industry, academia, the State, and other sector stakeholders to promote technical standards, circular economy, and waste valorization. As part of this vision, the possibility was raised of developing collaborative financing models, where revenues from the commercialization of mining waste could be reinvested in new research and solutions applicable to closure.



DATA & KPIS

CHALLENGE:

How do we define key KPIs and integrate them into monitoring and control systems for closure and post-closure?

The yellow team addressed the importance of having clear, measurable, and reliable indicators to strengthen decision-making during mine closure and post-closure.

Their proposal began with risk analysis and the implementation of controls as the basis for building more integrated management systems capable of accompanying the project's evolution throughout its entire life cycle. From this perspective, KPIs should not be limited to verifying compliance; they should also make it possible to measure the real effectiveness of the controls implemented.

The team highlighted the need to incorporate automation, data management, and continuous monitoring to anticipate changes, update controls, and generate traceable and auditable information. In this way, KPIs become a key tool for moving from reactive management to more predictive management, aligned with business and regulatory requirements.



SUCCESSFUL CLOSURE

CHALLENGE:

What is needed to achieve a truly successful mine closure?

The green team worked on the question of what is needed to achieve a truly successful mine closure, starting from a vision that goes beyond regulatory compliance.

Their proposal emphasized that closure must be planned from the conception of the business, incorporating social, environmental, economic, and territorial criteria.

To achieve this, it is essential to build a shared vision of the legacy, based on co-responsibility among the company, the State, communities, and other organizations.

The team emphasized the need for solid internal governance, led by senior management and articulated with all areas of the company. It also noted that successful closure must consider future land use, the restoration of ecosystem services, and a social and economic transition that generates sustainable opportunities beyond the useful life of the mine.



POST-CLOSURE RISKS

CHALLENGE:

How do we manage post-closure risks proactively?

The red team addressed post-closure risk management from a preventive perspective, understanding this stage as a dynamic process that must be planned and updated continuously.

Their proposal highlighted the importance of incorporating post-closure risks into the business risk matrix from early stages, so that decisions made during operation contribute to reducing future uncertainties. Along these lines, the team highlighted the role of research, pilot testing, and scalable solutions to improve sustainability and reduce costs in later stages.

The need was also raised to change the way post-closure is understood: not as an inevitable cost, but as a strategic investment aimed at protecting value, strengthening trust, and generating long-term opportunities for the territory and its stakeholders.



INTERACTION & STAKEHOLDERS

CHALLENGE:

How do we ensure systematic and permanent interaction with communities and authorities, from early stages through post-closure?

The blue team addressed interaction with communities and authorities as a process that must be systematic, permanent, and transparent from the earliest stages of the project through post-closure.

Their proposal highlighted that trust and social license are built from the beginning through early integration with stakeholders and clear governance that connects senior management, technical areas, permitting, operations, and community relations.

The team emphasized the importance of having permanent dialogue mechanisms, differentiated plans, and monitoring systems that make it possible to communicate progress, monitor commitments, and manage long-term expectations. From this perspective, stakeholder interaction stops being a one-off action and becomes an essential part of business continuity and legacy management.





At the closing of the 2nd Mine Closure Peru 2026 Congress, Edwin Zegarra D., Environmental, Water and Tailings Manager at Gold Fields La Cima and Vice President of the Congress, highlighted that this second edition made it possible to consolidate a more strategic vision of mine closure: understanding it not as the final stage of the mining cycle, but as a process that begins on day one and must be planned with a risk-based approach and technical, environmental and social responsibility.

“ **Mine closure is not only a technical challenge. It is, above all, a commitment to the environment, the ecosystem and people.** ”

During his address, he emphasized that the Congress covered fundamental topics that illustrate how mine closure is evolving beyond a final stage of the mining lifecycle toward a broader vision centered on legacy, long-term value, and sustainable outcomes. These topics included risk-based planning, realistic and sustainable cost development, governance, circular economy, resource recovery and long-term value generation.

He also highlighted that the experiences shared throughout the Congress showed how former mining operations can become opportunities to transform territories, restore ecosystems, and create new sources of value for surrounding communities. Finally, he encouraged participants to apply within their organizations the lessons, ideas, and challenges discussed during the Congress.

“ **The true value of this congress will be reflected in how we bring these reflections into practice in our companies.** ”

Edwin Zegarra D.
Vice President of the Congress
Mine Closure Peru 2026

BUILDING A
COMPREHENSIVE
VISION FOR
SUSTAINABLE CLOSURE
WITH A
POSITIVE LEGACY



2.º CONGRESO
CIERRE DE
MINAS
PERÚ 2026



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