



### WMC 2016 Synthetic Program View

See completed List of Technical Papers identification at the end of document

October 18 <sup>th</sup> - TUESDAY				
PLENARY SESSION				
MAIN AUDITORIUM				
09:30	Opening Ceremony			
12:30	Opening The EXPO			
	LUNCH			
14:30	Talk Show With CEO's			
16:00	REFRESHMENT BREAK			
16:15	Keynote Speaker			
17:00	Plenary with Chairpersons			
TECHNICAL PAPERS GRID IDENTIFICATION (NUMBER) *				
ROOM	ESMERALDA	TOPAZIO	SAFIRA	ALEXANDRITA
AXES	Innovation	Mineral Processing	Sustainability	Automation and Robotics
13:00 to 14:00				GERDAU reservation
16:30	214	95	160	187
16:55	173	45	201	
17:20	38	121	227	161
17:45	51	82	167	20
18:10	114	195	137	31

\* See completed List of Technical Papers identification at the end of document

All the Sessions will run simultaneously, from October 18 to 21, mornings and afternoons.

#### Poster Sessions

All posters must be delivered printed at the reception area at the moment of the registration. The posters will be displayed at the Exhibition area during the whole Congress. Authors are invited to be present during all the refreshment breaks. The Secretariat will not print any poster.

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# 24th World Mining Congress

## MINING IN A WORLD OF INNOVATION

October 18-21, 2016  
Rio de Janeiro/RJ • Brazil



**IBRAM**  
INSTITUTO BRASILEIRO DE MINERAÇÃO  
Brazilian Mining Association  
Câmara Mineira de Brasil

### WMC 2016 Synthetic Program View

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October 19th - WEDNESDAY								
PLENARY SESSION								
ROOM	VOTORANTI M METAIS	VALE/SINFERBASE		ESMERALDA		SAFIRA		
08:30	ISSA Mining Symposium on Safety and Health in Mining	IBRAM/MAC Tailings management		The Swedish experience in the mining sector		PUA University Award (Prêmio Universitário ABERJE 2016) Organization: VALE S.A		
10:30	REFRESHMENT BREAK							
10:45	ISSA Mining Symposium on Safety and Health in Mining and SESI - Brazil	IBRAM/MAC Tailings Management		The Swedish experience in the mining sector		PUA (Prêmio Universitário ABERJE 2016) Organization: VALE S.A		
12:30	LUNCH							
TECHNICAL PAPERS GRID IDENTIFICATION (NUMBER) *								
ROOM	VOTORANTIM METAIS	VALE	SINFERBASE	ESMERALDA	TOPAZIO	SAFIRA	ALEXANDRITA	
AXES	Mineral Processing	Surface Mining	Sustainability	Underground Mining	Automation/Innovation	Mineral Economics	GT IBRAM	
14:00	8	22	3	14	1	24	RESERVED 14h to 17h GT Comunicação IBRAM (Only for Guests)	
14:25	11	170	4	13	17	28		
14:50	180	50	33	16	94	32		
15:15	35	60	37	21	197	34		
15:40	193	63	62	25	2	147		
16:05	Refreshment Break							
16:30	43	66	188	65	6	49		
16:55	231	106	98	29	140	81		
17:20	55	115	105	30	23	139		
17:45	202	122	111	46	191	168		
18:10	36	239	251	27	26	149		

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October 20<sup>th</sup> - THURSDAY

#### PLENARY SESSION

ROOM	VOTORANTIM METAIS	VALE	SINFERBASE				
08:30	The Kellogg Innovation Network	Climate Change and Mining Industry	Mineral Exploration				
10:30	REFRESHMENT BREAK						
ROOM	VOTORANTIM METAIS	VALE	SINFERBASE	ESMERALDA			
10:45	Sustainability Governance Initiatives	Water, Mining and Communities	Productivity in mining operations	The future of mining in Americas			
12:30	LUNCH						
ROOM	VOTORANTIM METAIS	VALE	SINFERBASE	ESMERALDA	TOPAZIO	SAFIRA	ALEXANDRITA
AXES	Innovation/ Automation	Sustainability	Surface Mining	Mineral Exploration/ Mining Innovation	Underground Mining	Mining	Coal Session
14:00	54	212	128	163	67	123	19
14:25	69	74	134	174	73	183	39
14:50	107	148	135	5	76	184	40
15:15	230	213	138	15	96	196	53
15:40	233	87	142	99	97	192	77
16:05	Refreshment Break						
16:30	221	185	79	159	110	68	86
16:55	108	189	146	162	117	12	112
17:20	206	245	154	250	178	156	116
17:45	248	246	155	127	125	219	152
18:10	131	169	235	7	130	120	228

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#### Poster Sessions

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[WORLD MINING CONGRESS 2016 PROGRAM CLICK HERE](#)

[CONFIRMED SPEAKERS CLICK HERE](#)

Venue: SulAmerica Convention Center Address: Av. Paulo de Frontin, 1 - Cidade Nova, Rio de Janeiro

Version of October 18<sup>th</sup> -2016



**WMC 2016 Synthetic Program View**

See completed List of Technical Papers identification at the end of document

October 21 <sup>th</sup> FRIDAY							
PLENARY SESSION							
ROOM	VOTORANTIM METAIS		VALE		SINFERBASE	ESMERALDA	
08:30	Mining and Sustainable Development Goals		Mining Economics		Developing Innovation in Mining	Innovation in Blasting with ISEE	
10:30	REFRESHMENT BREAK						
ROOM	TOPÁZIO			SINFERBASE		ESMERALDA	
10:45	Using social license to prioritize stakeholders			INOVA MINERAL PROGRAM - BRAZIL		Innovation in Blasting with ISEE	
12:30	LUNCH						
ROOM	VOTORANTIM METAIS	VALE	SINFERBASE	ESMERALDA	TOPAZIO	SAFIRA	ALEXANDRITA
AXES	<b>Blasting Session</b>	<b>Sustainability</b>		<b>Mineral Processing</b>	<b>Sustainability</b>	<b>Surface Mining/Mineral Economics</b>	<b>Underground Mining</b>
14:00	84	158	RESERVED	59	203	243	132
14:25	85	157		58	204	172	133
14:50	92	141		104	222	126	144
15:15	143	145		57	119	47	176
15:40	166	199		224	232	101	177
16:05	175	200		80	217	190	226
16:30	205	216		89	198	244	249
17:00	CLOSING CEREMONY AT SINFERBASE ROOM						

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Dear Author,

If your paper is not listed and you paid your registration fee until September 18<sup>th</sup>, please inform the WMC Secretariat by e-mail to [secretary@wmc2016.org.br](mailto:secretary@wmc2016.org.br)

All papers listed here will be published at the electronic book "24<sup>th</sup> World Mining Congress Proceedings"

The Editorial Committee respected the Title and Authors informed in each file delivered as final version.

The Secretariat will not accept any more changes in this final list of papers to be published.

**Legend** - Papers only for ORAL/POSTER presentation without publication at the electronic book. Papers Numbers: 87, 169, 223, 246, 247, 252 and 253

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The [Program of WMC 2016](#) is available in our website and also the [Confirmed Speakers](#).

Regards,

WMC Secretariat  
October 18<sup>th</sup>, 2016



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Number	TITLE	Authors	Topic	ORAL/POSTER
1	ENERGY AUTOMATION AND HYBRIDIZATION: INTEGRATING RENEWABLE ENERGY FOR OFF-GRID MINING	John Okoro	AUTOMATION AND ROBOTICS	ORAL
2	INNOVATIVE SOLUTIONS OF MINING MACHINERY FOR UNDERGROUND APPLICATIONS – COMMERCIALIZATION OF RESEARCH RESULTS	M. Malec	MINING INNOVATION	ORAL
3	RESPONSIBLE MINING OPERATION	V. Budinsky	MINING SUSTAINABILITY	ORAL
4	SUSTAINABLE MODEL OF RESTORATION AND REHABILITATION IN KAOLIN MINED AREAS AT CABO DE SANTO AGOSTINHO – PERNAMBUCO	C. F. Afonso de Melo, and C. M. M. E. SILVA, F. W. H. VIDAL	MINING SUSTAINABILITY	ORAL
5	MINERAL EXPLORATION PROCEDURE(S) IN BRAZIL UNDER A NEW LEGAL SCENARIO	Gabriela Salazar Silva Pinto	MINERAL EXPLORATION	ORAL
6	RECENT ACHIEVEMENTS IN INVESTIGATIONS OF DYNAMICS OF SURFACE MINING HEAVY MACHINES	D. Pietrusiak, P. Moczko, E. Rusiński	MINING INNOVATION	ORAL
7	DATA STORAGE DEVICES: A REVIEW	GURINDER KAUR AHLUWALA	MINING INNOVATION	ORAL
8	CHARACTERIZATION OF GOLD MINERALS USING SEM, XRF AND LIBS TECHNIQUES	Gurinder K. Ahluwalia and Jacquelyn Maccoon	MINERAL PROCESSING	ORAL
9	COMPUTATIONAL FLUID DYNAMICS SIMULATION OF COOLING SYSTEM FOR COPPER SMELTER GASES BY TENIENTE CONVERTER WITH EVAPORATIVE COOLER	S. Pérez, Y. Aguilera, J. Hurtado, J. Vargas	MINERAL PROCESSING	POSTER
10	EMPLOYABILITY ANALYSIS IN THE FUTURE OF MINING ENGINEER IN CHILE	Juan Pablo Hurtado, Juan Pablo Vargas Norambuena, Andrés Sánchez, Pamela Jara and Sebastián Pérez	MINING SUSTAINABILITY	POSTER
11	ANALYSIS OF BENEFICIATION OF VARIOUS COAL TYPES DEPENDABLY ON ANALYTIC MOISTURE OF RESEARCHED MATERIAL	T. Niedoba, A. Surowiak and P. Pięta	MINERAL PROCESSING	ORAL
12	BENEFICIATION OF INDUSTRIAL MINERALS USING A TRIBO-ELECTRIC BELT SEPARATOR	F.J. Hrach and K.P. Flynn, P. J.Miranda	MINERAL PROCESSING	ORAL
13	DRAINAGE OF PROCESSING RESIDUALS FROM POTASH MINING FOR THE APPLICATION AS BACKFILL	F. Schreiter, H. Mischo	UNDERGROUND MINING	ORAL
14	LONGWALL TOP-COAL CAVING MINING IN EXTREMELY INCLINED THICK COAL SEAM	JIACHEN WANG, SHENGLI YANG, JINGWANG ZHANG, XIAOMENG LI, YANG LI	UNDERGROUND MINING	ORAL
15	CHARACTERIZATION OF THE INTRUSIVE BODIES FROM THE GOIÁS ALKALINE PROVINCE USING GEOPHYSICAL INVERSION AND SELF-ORGANIZING MAPS	Aisengart, T., Ando, J. L., Barbosa, R. D., Rech, M., Pereira, J.G., and Porto, C.	MINERAL EXPLORATION	ORAL
16	UNDERGROUND EXPLOITATION OF NATURAL STONE IN CROATIAN LAYERED DEPOSITS	Ivan Cotman	UNDERGROUND MINING	ORAL
17	TELERESCUER - AN INNOVATIVE ROBOTIZED SYSTEM FOR SUPPORTING MINING RESCUERS BY INSPECTING ROADWAYS AFFECTED BY CATASTROPHES	Wojciech Moczulski, Krzysztof Cyran, Marcin Januszka, Petr Novak, Anna Timofiejczuk	AUTOMATION AND ROBOTICS	ORAL
18	ESTIMATION OF THE CONSTRUCTION TIME OF AIR INJECTON TUNNELS 11 AND 12 OF THE CHUQUICAMATA UNDERGROUND PROJECT	Carlos Corvalán, Juan P. Vargas, Juan P. Hurtado & Pamela Jara	UNDERGROUND MINING	POSTER

Number	TITLE	Authors	Topic	ORAL/POSTER
19	TRENDS AND DETERMINANTS OF HARD COAL EXPORT AND IMPORT IN POLAND IN RETROSPECTIVE AND PROSPECTIVE VIEW	M. Turek and I. Jonek-Kowalska	MINERAL ECONOMICS	ORAL
20	LEAN SPEED OPTIMIZATION APPLIED TO A CYCLIC HAUL OPERATION	D. Rylander, J. Fryk, P. Wallin and J. Axelsson	AUTOMATION AND ROBOTICS	ORAL
21	VIOLENT COAL PILLAR COLLAPSE	A.C. Zingano	UNDERGROUND MINING	ORAL
22	GEOREFERENCED MONITORING SYSTEM FOR OPEN PIT MESH NETWORKS	Bruno Alexandro Garcia Tejada	SURFACE MINING	ORAL
23	EXPERIENCES IN RECOGNITION OF GASO-GEODYNAMIC ZONES IN THE ROCK MASS OF A COPPER ORE MINE USING GEOPHYSICAL METHODS	Z. Pilecki and K. Porębski, E. Pilecka, D. Jach, R. Czarny, J. Wróbel, P. Harba, P. Piasecki, E. Koziarz	MINING INNOVATION	ORAL
24	ESTIMATION OF LONG TERM SUSTAINABILITY FOR SILVER SUPPLY	Wenhua Li and Tsuyoshi Adachi	MINERAL ECONOMICS	ORAL
25	OPTIMIZATION OF THE ROCK MASS IDENTIFICATION METHODOLOGY FOR MINE DESIGN IN POLAND	S. Fabich, D. Nitek, A. Waligóra, M. Rajczakowska, S. Świtoń	UNDERGROUND MINING	ORAL
26	AN INTEGRATED APPROACH TO OPTIMISATION OF LONGWALL GAS DRAINAGE	Hua Guo, Clint Todhunter, Qingdong Qu, Hamish Kerr, and Johnny Qin	MINING INNOVATION	ORAL
27	A FIELD INVESTIGATION OF MINING-INDUCED STRATA, GROUNDWATER AND GAS BEHAVIOURS	Qingdong Qu and Hua Guo	UNDERGROUND MINING	ORAL
28	DOES MINING SECTOR IMPROVES OR RETARDS GROWTH AND DEVELOPMENT? CASE STUDY OF BOTSWANA AND AUSTRALIA	Kegomoditswe Koitsiwe, Tsuyoshi Adachi	MINERAL ECONOMICS	ORAL
29	PANNEL OPENING IN SUBLEVEL OPEN STOPE MINING USING MODELING SOFTWARE	R.F. Massabki	UNDERGROUND MINING	ORAL
30	AN INVESTIGATION INTO EFFECT OF MINE TAILING PARTICLE SIZE IN THE STRENGTH EVOLUTION OF CEMENTED MINE BACK FILL	M. Kermani, F.P. Hassani	UNDERGROUND MINING	ORAL
31	MINE AUTOMATION AND IMPLEMENTATION OF INNOVATIVE TECHNOLOGY: A REVIEW IN INDIAN CONTEXT	Narendra Kumar Nanda, Shailendra Kumar	AUTOMATION AND ROBOTICS	ORAL
32	GLOBAL TRENDS IN MINING PRODUCTION	Chr. Reichl	MINERAL ECONOMICS	ORAL
33	PARTICIPATORY LAND USE PLANNING FOR SAFEGUARDING ACCESS TO MINERAL DEPOSITS IN EUROPE	Murguía, D., Cormont, A., van Eupen, M. Pérez-Soba, M., Verweij, P. , van der Sluis, T. , Carvalho, J., Lopes, C., Cowley, J. , Sutton, G. , Wårrel, L. , Tiess G.	MINING SUSTAINABILITY	ORAL
34	FOSTERING INTERNATIONAL COOPERATION IN THE FIELD OF RAW MATERIALS – THE INTRAW PROJECT AND THE EUROPEAN INTERNATIONAL OBSERVATORY FOR RAW MATERIALS	Murguía, D., Brovko, F., Wenham, M., Correia, V. , Bodo, B.	MINING INNOVATION	ORAL
35	ZINC DEPRESSION IN THE GALENA FLOTATION OF ERMA REKA CONCENTRATOR	M. Ranchev, N. Valkanov, I. Grigorova and I. Nishkov	MINERAL PROCESSING	ORAL

Number	TITLE	Authors	Topic	ORAL/POSTER
36	REPRESENTATIVE SAMPLING – THE WAY TO THE PRECISE METAL ACCOUNTING	M. Ranchev, L. Tsotsorkov, D. Nikolov, A. Angelov, T. Pukov, I. Grigorova and I. Nishkov	MINERAL PROCESSING	ORAL
37	SUSTAINABILITY ASSESSMENT OF THE MINING SECTOR IN BRAZIL	Wellington Alves, Paula Ferreira and Madalena Araújo	MINING SUSTAINABILITY	ORAL
38	SIMULATION OF PRODUCTIVITY PARAMETERS APPLIED TO ELABORATION OF MINING PLANS	E. C. Rodovalho and G. De Tomi	MINING INNOVATION	ORAL
39	GASIFICATION ZONE EVALUATION USING AE TECHNOLOGY FOR EX-SITU UCG EXPERIMENTATION USING AN ARTIFICIAL COAL SEAM	F. Q. Su, K. Itakura, A. Hamanaka, G. Deguchi, J. Kodama, K. Sato and K. Takahashi	MINING SUSTAINABILITY	ORAL
40	MODEL EXPERIMENT FOR CO-AXIAL UNDERGROUND COAL GASIFICATION SYSTEM DEVELOPMENT	A. Hamanaka, K. Itakura, F. Q. Su, K. Takahashi, K. Sato, G. Deguchi, and J. Kodama	MINING SUSTAINABILITY	ORAL
41	MONITORING CH <sub>4</sub> , CO <sub>2</sub> AND CO CONCENTRATIONS ON THE AIR OF THE UNDERGROUND COAL MINES IN SOUTHERN BRAZIL	B. Bonetti and R.C. Abruzzi, M.J.R. Pires, B.A. Dedavid, A.K. Bitencourt, C.J.B. Gomes	MINING SUSTAINABILITY	POSTER
42	REMOVAL OF METALS OF ACID MINE DRAINAGE BY PRECIPITATION AND BY ION EXCHANGE WITH ZEOLITE NaP1	Martha Beatriz Horn, Ivo Schneider, Marçal Pires, Beatriz Bonetti	MINING SUSTAINABILITY	POSTER
43	MULTISTAGE FLOTATION OF MINE TAILING FOR COPPER AND NICKEL RECOVERY AND UPGRADING	R.S. Magwaneng, K. Haga and A. Shibayama	MINERAL PROCESSING	ORAL
44	THE ROLE OF BRITTLE STRUCTURES ON THE EMPLACEMENT OF MINERALIZED PEGMATITES IN THE PEDRA LAVRADA DISTRICT, NE BRAZIL	Emerson Diego Gomes Sales, Vandrielle Alves Genuíno, Lauro César Montefalco de Lira Santos, Fabrício Fernandes Vieira, Francisco Wilson Hollanda Vidal	MINERAL EXPLORATION	POSTER
45	NEW ORE CHARACTERIZATION METHOD IN HEAVY LIQUID SEPARATION WITH LIQUID INORGANIC AND APPLICATION IN JASPILITE IRON ORE SAMPLES	Ricardo Álvares de Campos Cordeiro and Ronaldo de Moreira Horta	MINERAL PROCESSING	ORAL
46	OVERBURDEN MOVEMENT IN MULTIPLE-SEAMS LONGWALL MINING	Yang Li, Huaqun Wang, Kangning Zhang	UNDERGROUND MINING	ORAL
47	INNOVATION AS A COMPARATIVE ADVANTAGE IN THE BRAZILIAN MINING SECTOR	M. A. C. Nery	MINING INNOVATION	ORAL
48	SIMULATION OF STRUCTURAL DISCONTINUITIES IN MINING PHYSICAL MODELS FROM GEOLOGICAL ANALOGUE MODELS AND DOUBLE SCALING	P.P. Jara, N. Labbé, J.P. Hurtado, J.P. Vargas and J. Acevedo	MINING INNOVATION	POSTER
49	OPTIMIZATION ON LONG TERM SUPPLY OF INDONESIAN COAL TO DOMESTIC MARKET	Fadhila Achmadi ROSYID and Tsuyoshi ADACHI	MINERAL ECONOMICS	ORAL
50	THE LOADING AND HAULING SIMULATION OF ORE OPERATION OF A BAUXITE MINE IN WESTERN PARÁ, BRAZIL	M.J.B. Santos	SURFACE MINING	ORAL
51	EXPERIMENTAL STUDY OF SUSTAINABLE EXTRACTION OF GEOTHERMAL HEAT FROM UNDERGROUND MINES IN CANADA	Seyed Ali Ghoreishi-Madiseh, Ferri P. Hassani, Jeffrey Templeton, Leyla Amiri, Mohannad Dabbas, Agus P. Sasmito, and Malcolm Scoble	MINING INNOVATION	ORAL
52	OBJECT MAP AS A MEAN OF CREATING COMPLETE INVENTORY OF INFRASTRUCTURE IN UNDERGROUND MINES	A. Dyczko and D. Galica and E.J. Sobczyk and J. Kicki and J. Jarosz	UNDERGROUND MINING	POSTER



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53	AN OVERVIEW ON THE USE OF COAL COMBUSTION RESIDUES IN ACTIVE AND ABANDONED COAL MINES	Jan Palarski and Franciszek Plewa	UNDERGROUND MINING	ORAL
54	WEAR MONITORING: INTELLIGENT INTERIOR COATINGS FOR SLURRY PIPE LINES AND OTHER HIGH WEAR MINING EQUIPMENT	Michael Magerstädt, Sven Engbers, Larry K.L. Lai, Thorsten Räth, Dieter Meendermann, Martin Runde, Stefan Forste	MINING INNOVATION	ORAL
55	FREQUENT AND FAST PROCESS MONITORING DURING MINERAL BENEFICIATION USING MODERN X-RAY TECHNOLOGIES	U. König and N. Norberg	MINERAL PROCESSING	ORAL
56	PRE-CONCENTRATION OF SILICATE ZINC ORE USING DENSITY AND MAGNETIC CONCENTRATIONS	D. José Neto and M.G. Bergerman, A.D. Souza and E.L.C. Martins and V.Metsavaht and J.L.C. Bechir and L.M.C. Lopes and M.M. Lopes and C.J. Freitas Neto and J.M.C. Melo and C.A.M. Oliveira and L.M. Resende	MINERAL PROCESSING	POSTER
57	NAOH CONSUMPTION IN STARCHES GELATINIZATION FOR FROTH FLOTATION USE AS DEPRESSOR	A. C. SILVA, D. N. SOUSA, E. M. S. SILVA, T. P. FONTES, R. S. TOMAZ, M. R. BARROS	MINING INNOVATION	ORAL
58	INFLUENCE OF PULSATION FREQUENCY IN IRON OXIDE FINE PARTICLES JIGGING	R. S. Tomaz, A. C. Silva, E. M. S. Silva, D. N. Sousa	MINING INNOVATION	ORAL
59	QUALITY IMPROVEMENT OF AN IRON ORE JASPER BY SELECTIVE MILLING	E.L. Souza, O.B. Reis, L.C. Borges, D.F. Pereira	MINERAL PROCESSING	ORAL
60	EXPERIENCES FROM EXPERIMENTAL MINING IN BRAZIL	M. Cardu, J. Seccatore, J. Bettencourt	SURFACE MINING	ORAL
61	SAMPLING TESTS OF METAL ACCOUNTING STREAMS IN ASSAREL CONCENTRATOR	M. Ranchev, L. Tsotsorkov, D. Nikolov, A. Angelov, T. Pukov, I. Grigorova and I. Nishkov	MINERAL PROCESSING	POSTER
62	ASSESSMENT AND CONTROL OF SOIL EROSION FROM HILLTOP IRON ORE MINES: A CASE STUDY	Sushil N. Mhaske, K. Pathak, Arun Kumar	MINING SUSTAINABILITY	ORAL
63	MINING PLANNING OF GYPSUM EXPLOITATION WITH TERRACE MINING APPROACH	J.C. de Souza, H.C. Rodrigues, R. A. da Silva, S.S. Rocha, F.F. Bastos	MINING SUSTAINABILITY	ORAL
64	SIMULATION AND ANALYSIS OF FRAGMENTATION IN ROCK BLASTING AT THE HERVAL QUARRY - BARREIROS – PE	J.C. de Souza and A.C.S. Silva, R.A. Silva, S.S. Rocha	SURFACE MINING	POSTER
65	EFFECT OF PARTICLE SIZE ON WEAR IN MINE BACKFILL DISTRIBUTION SYSTEMS DETERMINED USING A ROTARY TEST AND IN-SITU TESTING	K.J. Creber and M.F. Kermani and M. McGuinness and F.P. Hassani	UNDERGROUND MINING	ORAL
66	COMBINING FLEXIBILITY WITH CONVEYOR BASED MINING	Karl G. Ingmarsson and Dr. Andreas Oberrauner	SURFACE MINING	ORAL
67	CURRENTLY USED TECHNOLOGY OF SHAFT SINKING IN POLISH COPPER MINES – ANALYSIS OF WEAK POINTS, AND POSSIBILITY TO IMPROVEMENTS	S.Fabich, S.Świtoń and M.Rajczakowska	UNDERGROUND MINING	ORAL
68	PERFORMANCE EVALUATION OF A DEWATERING CYCLONE BASED ON UNDERFLOW DISCHARGE PATTERN	Rakesh Kumar Dubey, Arun Kumar Majumder, K.U.M. Rao	MINERAL PROCESSING	ORAL
69	DNPM's UAV PROJECT – UAV APPLICATION FOR MONITORING AND INSPECTION OF MINING ACTIVITIES AND DAMS	C.P. Bicho and C.A. da Silva	MINING INNOVATION	ORAL
70	EVOLUTION OF MINING CONCESSIONS IN BRAZIL – 2000-2015	Mathias Heider	MINERAL ECONOMICS	POSTER

Number	TITLE	Authors	Topic	ORAL/POSTER
71	THE MINING OF CLAY AS ORGANIZED IN THE FORM OF COOPERATIVES	Mathias Heider	MINING SUSTAINABILITY	POSTER
72	MINERAL BUSINESS: ASYMMETRIES OF THE SUSTAINABILITY	Antonio Fernando S. Rodrigues	MINING SUSTAINABILITY	POSTER
73	DESIGNING OF LONGWALLS WITH HIGH OUTPUT CAPACITY IN THE VERY GASSY HARD COAL SEAMS □	E.Krause, J.Skiba	UNDERGROUND MINING	ORAL
74	FINE FLOTATION TAILINGS DEWATERING: RESTORING DEWATERING EFFICIENCIES AND SUPPLEMENTING WATER CONSUMPTION IN A GRAVITY GOLD RECOVERY CIRCUIT	Cameron J.H. Stockman	MINERAL PROCESSING	ORAL
75	THE QUESTION: WHICH EXPLOSIVE TO USE? ANFO, EMULSIONS OR BLENDS?	P. N. Worsley, Ph.D. Eurlng	MINERAL PROCESSING	ORAL
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