

INNOVATION
ENGINE FOR GROWTH



Rock Dust Partnership Meeting

November 15th, 2018



IMERYS

Imerys Carbonates: Global Provider of Carbonates Products

- Imerys Carbonates is part of a multi-mineral group
 - ◆ Broad range of minerals, from Andalusite to Zirconia
 - ◆ Extensive expertise in calcium carbonate and other minerals in the group
 - ◆ Possibilities to offer custom mineral solutions

- Imerys has 270 industrial sites in more than 50 countries with over 18,300 employees
 - ◆ Carbonates group has 52 industrial sites in 21 Countries
 - ◆ In North America, Imerys Carbonates has 6 quarries currently operating with over 20 years of proven reserves

- Imerys has 11 technical centers globally with 400 employees

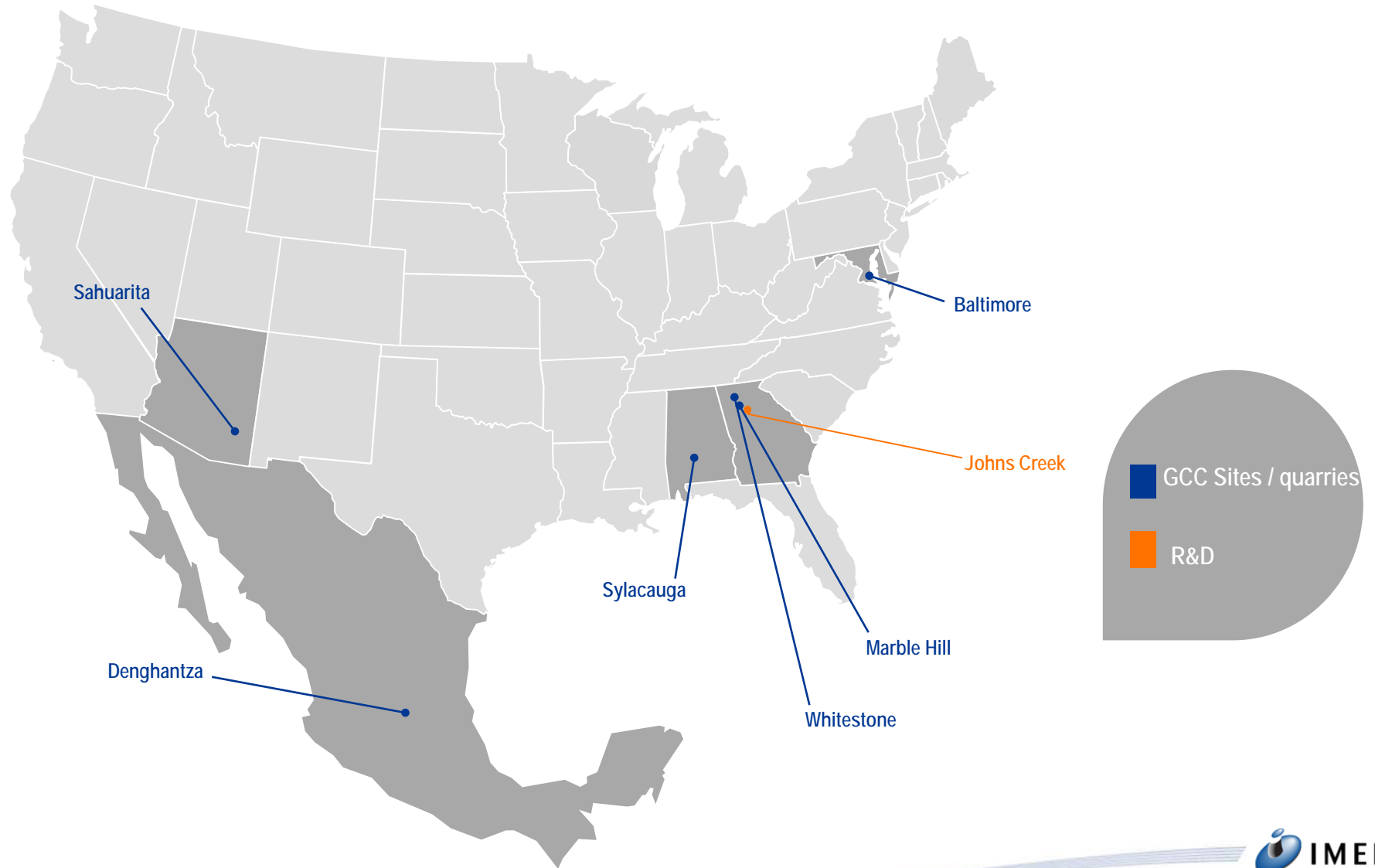


Ipoh Quarry, Malaysia

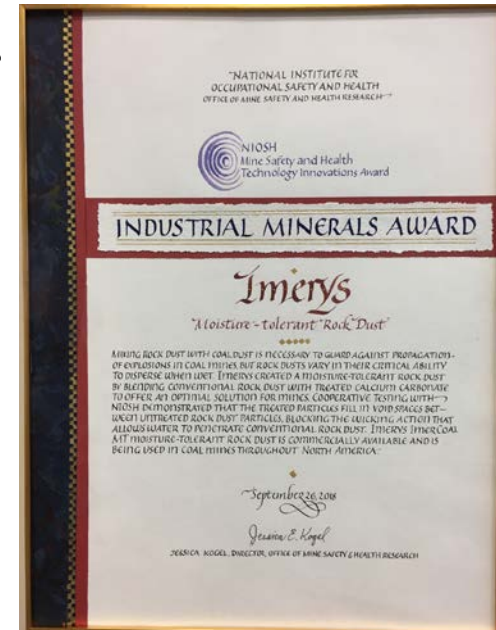
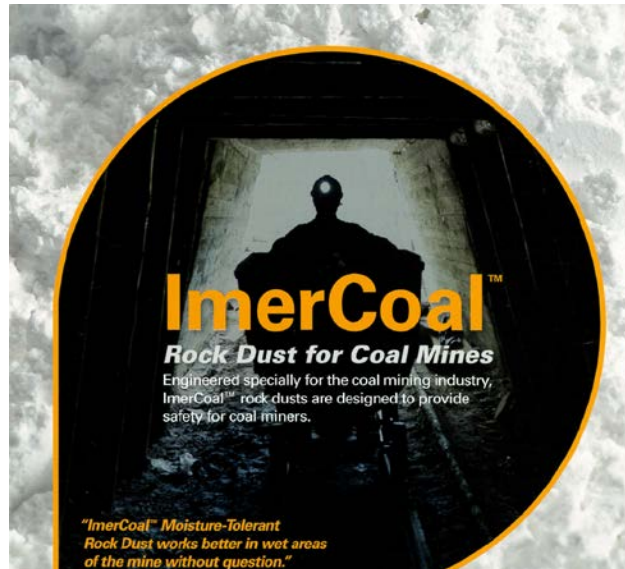
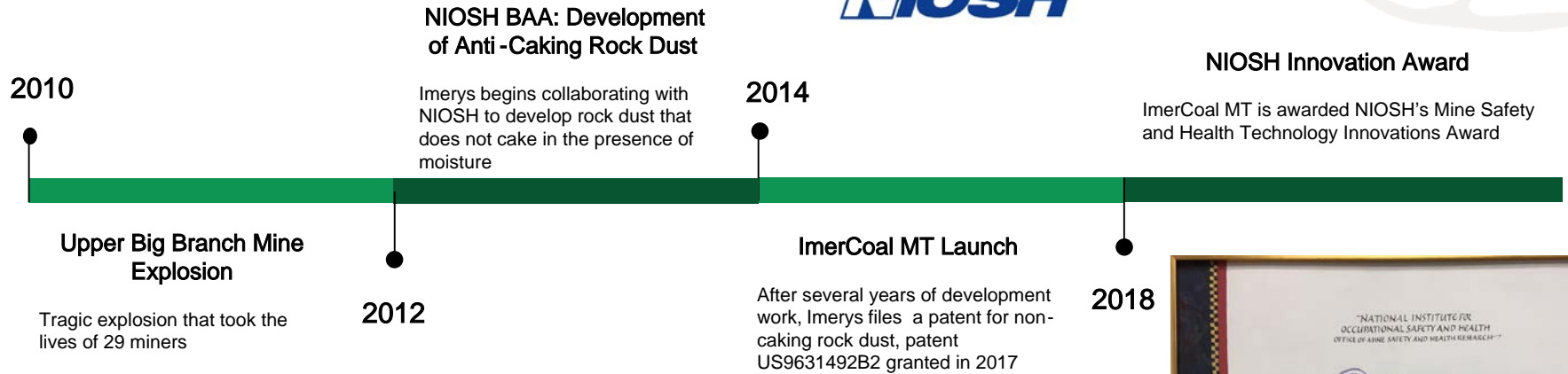


Sahuarita Quarry, Arizona

Imerys Carbonates North America Operations



ImerCoal MT Development



ImerCoal MT: Moisture Tolerant Rock Dust

ImerCoal MT...

- Meets ALL requirements of 30 C.F.R. 75.2
- 99% of composition is equal to original Imerys rock dust
- Does not cake in the presence of water
- Effective at inerting explosions under wet and dry conditions
- Long lasting, effectively dispersed in test mines for over 6 months



ImerCoal MT (left) vs. Conventional Rock Dust (right)

Properties	30 CFR 75.2	ImerCoal MT
Combustible Matter	5%, maximum	< 0.2%
Passing 20 Mesh	100%	100%
Passing 200 mesh	70%, minimum	99%
Silica, free and combined	4%, maximum	1%
Disperses After Wetting and Drying	Yes	Yes



ImerCoal MT: Dependable Dust

- ImerCoal MT was tested by NIOSH using 20-L Explosion Chamber, results indicated that its inerting potential is equal to conventional rock dust
- Large-scale testing by NIOSH at Stockton Mine demonstrated that ImerCoal MT does not cake and remains dispersible the presence of moisture, unlike untreated rock dust
 - [Source: Marris ML, Organiscak J, Klima S, Perera IR (2017) Respirable Dust Measured Downwind During Rock Dust Application. Mining Engineering, Vol. 69, No. 5, pp. 69-74]
- Recent testing at Experimental Mine Barbara concluded that treated rock dust had equal performance to non-treated rock dust at TIC value of 50%, at TIC value of 60% treated rock dust was more effective than non-treated rock dust
 - [Source: Harris ML, Sapko MJ, Dyduch Z, Cybulski K, Hildebrandt R, Goodman GVR (2018) Large-scale Dust Explosions: Treated vs. Non-treated Rock Dust]



Benefits of ImerCoal MT

Benefits of ImerCoal MT include....

- It can be applied the same way as conventional rock dust, no additional equipment required
 - Can be applied to pre-wetted ribs and roofs
- It's easier to transport pneumatically over long distances than conventional rock dust
- Does not clog dusting lines, which can provide cost savings by reducing down time
- Maintains a bright, white appearance even after exposure to moisture
 - Appears more compliant due to resilient color
- Remains dry and fluffy which improves ability to rake and neutralize fresh float coal dust accumulations
- Remains dispersible in sealed or remote mined out areas
- Frequency of rock dust re-application can potentially be reduced in some areas, which reduces costs and exposure to nuisance dust
- No problems caused by mixing ImerCoal MT with conventional rock dust



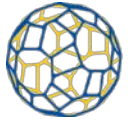
WARRIOR
MET COAL



ImerCoal MT- Future Advancements

- ImerCoal MT incorporates a small fraction of treated particles, which is more efficient economically than using 100% treated rock dust
- ImerCoal MT production requirements are more demanding than conventional rock dust
 - Cumulative energy required to produce treated component is 6 times greater than energy required to produce coarse, untreated component
 - [Source: IMA-NA Life Cycle Assessment for Calcium Carbonate]
 - Blending the two components also contributes to cost
- ImerCoal MT is still in early adoption phase of product life cycle, economies of scale not yet reached
- Alternative paths to market commercialization are being considered to reduce costs
 - Expanding ImerCoal MT sales and finding new applications for this technology to reach economies of scale
 - Licensing this technology to other rock dust producers would improve logistics and reduce cost





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