

2024 Regional Mining Conference Technical Sessions Schedule and Abstracts

Schedule	Room 116	Room 117	Room 118
Wednesday Morning October 9	Reclamation Elliot Mallard - Chemours	Mining & Mine planning Brian Ball - Sr Manager, Mine Planning - Mosaic	Health & Safety / Environmental Jody Grizz - Safety Supervisor - Mosaic
9:00 - 9:30	<p style="text-align: center;">Advances in Nature Based Solution Solutions for Reclamation</p> <p style="text-align: center;">Andrew Harley - Client Services Director Mining - SWCA Environmental Consultants</p> <p>Nature-based solutions (NBS) for reclamation are emerging as effective, sustainable approaches to restoring degraded landscapes while enhancing ecosystem services. This presentation will explore recent advances in the use of NBS to address challenges in land reclamation, with a focus on integrating natural processes into engineering projects. These solutions, which leverage the benefits of natural ecosystems, include reforestation, wetland restoration, and the use of bioengineering techniques like living shorelines and green infrastructure. By harnessing the resilience of native vegetation and natural habitats, NBS provide cost-effective, long-term solutions to issues such as soil erosion, habitat loss, and water pollution. The presentation will discuss case studies where NBS have successfully reclaimed disturbed mining sites, agricultural lands, and urban brownfields, improving biodiversity, water retention, and carbon sequestration. Emphasis will be placed on the importance of interdisciplinary collaboration and community engagement in the design and implementation of these projects. Finally, the presentation will consider the future of NBS in reclamation, highlighting technological innovations and policy developments that support large-scale adoption. These solutions represent a vital shift toward more adaptive, nature-centric practices in the reclamation field, offering a pathway to more resilient and sustainable ecosystems.</p>	<p style="text-align: center;">Deswik - Transforming the Future of Mine Planning / Operational Control at Mosaic</p> <p style="text-align: center;">Dustin Holcomb - Mine Planning Superintendent - Mosaic</p> <p>I will be discussing the implementation of the Deswik mine planning and operations control software, and it's role in the transformation of Mosaic's operations planning and management. This will highlight the advancement in short-term and long-term mine planning and reconciliation, as well as operational scheduling and plan execution</p>	<p style="text-align: center;">Piney Point Closure 2024 Update - Manatee County's Re-treatment & UIC Facility Operations</p> <p style="text-align: center;">Brad Pekas - Sr Engineer / Hydrogeologist - CIP Solutions</p> <p>After the near catastrophic failure of the leaking gypsum stack in the spring of 2021, the Florida Department of Environmental Protection (FDEP), Manatee County, and facility's court appointed bankruptcy receivership took action to develop a strategy to permanently solve one of the biggest environmental challenges facing the former Piney Point phosphate facility - how to manage, treat, and dispose of hundreds of millions of gallons of impacted phosphate process and comingled sea water contained in lined ponds and within the inactive gypsum stack. The solution – construct and operate an underground injection control (UIC) well facility to treat and dispose of this impacted water. While the FDEP, Donica Receivership Services, and Ardaman are actively working to close the former gypsum stack at the Piney Point facility, Manatee County's nearby actions "across the street" are an integral part of the long-term solution to permanently close this facility. This presentation focuses on the construction and operation of the pretreatment facility and UIC well by Manatee County, and include summary descriptions of the following items:</p> <ul style="list-style-type: none"> - the UIC well design - the pretreatment plant design and operations - the importance of close coordination/communication between the plant-facility - the key performance indicators and treated/injected volumes - lessons learned to date
9:35 - 10:05		<p style="text-align: center;">Block Modeling in Leapfrog</p> <p style="text-align: center;">Jonathon Flory - Resource Geologist - Mosaic</p> <p>In an effort to refine reserve/resource estimation and mine planning, Mosaic's phosphate team has implemented Leapfrog geologic modeling software. Leapfrog geologic modeling software will allow for increased flexibility, analysis and mining scenario efficiency. The increasingly complex geology of the southern extension reserve requires a more robust and dynamic modeling software. Leapfrog will increase Mosaic's accuracy and efficiency of block model based mine planning and reserve/resource reporting. Additional functionality is intended to be implemented to the ore control geologists in the field and on-board dragline monitoring integration development.</p>	<p style="text-align: center;">Safe Driver Technology Improvement in Field Data Collection</p> <p style="text-align: center;">Nichole Gizzi - Safety Lead - Mosaic</p>
Break			
10:55 - 11:25	<p>Speaker obtained - Need Speaker form</p>	<p style="text-align: center;">Hurricane Ian and Geographic Information Systems: Impact Assessment & Response</p> <p style="text-align: center;">Josh House - GIS Superintendent - Mosaic</p> <p>Hurricanes present a considerable challenge to mining operations as they require constant monitoring of weather conditions, dynamic risk assessment, equipment mobilization, shutdown/startup deliberation, effective communication, and significant recovery efforts. Ensuring these tasks are performed safely and efficiently is paramount. This presentation will use Hurricane Ian as a case study to demonstrate how Mosaic utilizes Geographic Information Systems (GIS) to help manage extreme weather events. Attendees will gain insight to the practical application of GIS to enhance situational awareness, streamline communication, and improve decision-making processes.</p>	<p style="text-align: center;">Environmental Technology Improvement in Field Data Collection</p> <p style="text-align: center;">Devin Lawrence - Senior Environmental Specialist - Mosaic</p> <p>This presentation outlines the various avenues in which emerging technology and database integration capabilities have been utilized to modernize environmental data collection in the phosphate industry. We will discuss the collection of piezometric data via ESRI ArcGIS Field Maps smartphone application and the associated database integration used to process field data for compliance reporting. We will also discuss several "real-time" surface and groundwater quality/quantity monitoring tools that have been implemented successfully.</p>
11:30 - 12:00	<p>Speaker obtained - Need Speaker form</p>	<p style="text-align: center;">Extending the Life of the South Fort Meade Mine - The Path to the Eastern Extension</p> <p style="text-align: center;">Matthew Remmert - Project Engineer - Mosaic</p> <p>South Fort Meade Mine was expected to exhaust its reserves by 2021. While the development of Eastern Reserves enabled a few years of additional mining, Eastern Extension will take South Fort Meade well into the next decade. However, accessing the mining area is no simple task. Precision planning and execution are needed to construct a 10 mile corridor comprised of 17 environmental crossings, dragline walkpath, electrical distribution and pumping systems. Additional aspects include the relocation of a utility electrical transmission line and dairy farm remediation.</p>	

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Wednesday Afternoon October 10	<p><u>Geology</u> Francis Cheung - Ardaman</p>	<p><u>Chemical Processing</u> Bob Andrew</p>	<p><u>Mineral Processing</u> Austin Gao - Arkema</p>
1:30 - 2:00	<p style="text-align: center;">Constructing a Subsurface Barrier (SB) Wall at Mosaic's Eastern Extension</p> <p style="text-align: center;"><u>Brian Studiale - Hydrogeologist - Mosaic</u></p> <p>At Mosaic's Eastern Extension project in West-Central Florida, local geology consists of sandy, highly transmissive overburden with deep phosphatic matrix requiring nontypical pre-mining dewatering techniques to improve dragline stability and maximize ore recovery. Feasibility assessments and conceptual design evaluations concluded that the best technical solution to mitigate against excessive seepage from offsite properties into the mine area and maintain off-site water levels was to construct a subsurface barrier wall along portions of the mine perimeter where the phosphate reserves are the deepest. Wall construction is scheduled to begin in early 2025. This enables Mosaic's mine expansion further east and deeper than ever before.</p>	<p style="text-align: center;">New Standard of Practice to Assess Subsurface Conditions and Mitigate Risks for Design, Construction and Monitoring of Phosphogypsum Stacks in Karst Environments</p> <p style="text-align: center;">Peter Dominguez - Sr. Manager, Geotechnical & Gypsum Operations - Mosaic and Mohamad Al-hawaree - P.E. President - Ardaman</p> <p>Phosphogypsum management practice has evolved over the years, from disposal of phosphogypsum in lowlands, mangroves, and along coastline in the 1880s when phosphate mining in Florida began, to land stacking of phosphogypsum in the 1930s when the method was developed. Mosaic, in collaboration with Ardaman & Associates, Inc., and with support of the Florida Department of Environmental Protection, launched an initiative in 2018 to advance the state-of-the-art for design, construction, and monitoring of phosphogypsum stacks. With this endeavor, the standard of practice for subsurface exploration has advanced significantly through the adoption of the following new technologies that were not previously available or employed: (i) micro-seismic monitoring, (ii) distributed optical cable sensors, (iii) seismic reflection survey, (iv) microgravity survey, and (v) vibrating wire piezometers. This presentation will review the benefits of these new investigative tools to assess subsurface condition, and highlight recent advancements in design and monitoring of phosphogypsum stacks to mitigate risks.</p>	<p style="text-align: center;">Bayovar Phosphate Rock and Phosphoric Acid Production</p> <p style="text-align: center;"><u>Marco Carrasco - Process and Project Manager</u></p> <p>Fosfos del Pacifico (Fospac) is a Peruvian company that has conducted feasibility studies for a phosphate production project at Bayovar, Peru. The Bayovar phosphate plant is world renowned for its highly reactive phosphate rock. Regarding the phosphate project, the first activities consisted of several forage fields where representative samples of the seven phosphate deposits were obtained. From these samples, laboratory and pilot studies were conducted to obtain geometric data and the physical and chemical characteristics of each phosphate bed. Variability, optimization and pilot tests were conducted to evaluate the wet process and pyroprocessor in order to improve the quality of the phosphate rock. The laboratory and pilot tests have identified two types of phosphate rock: the one that needs to be washed and the one that needs to be washed and floated. Comparison of the laboratory and pilot test results has allowed for more accurate equipment design and selection. Based on the laboratory and pilot tests of the phosphate rock, pilot tests were conducted for the production of phosphoric acid and fertilizers such as SSP and TSP. The data obtained allowed developing the feasibility engineering of the project for the production of phosphate rock.</p>
2:05 - 2:35	<p style="text-align: center;">Potential Use of Deep Well Injection for the Disposal of Treated Process Water</p> <p style="text-align: center;"><u>Douglas Dufresne - Ardaman</u></p> <p>This study investigates the potential use of deep well injection for the disposal of treated process waters generated at concentrate phosphate plants in Florida. Although most phosphate plants generally operate with a negative water balance, excessive rainfall periodically during the year may make it necessary to treat and discharge excess process water and contaminated nonprocess water. In order to reach acceptable specific conductance standards in the treated waters, fresh water pumped from the Floridan aquifer often needs to be added to properly dilute the waters for surface water discharge. Injection wells would provide the industry aquifer often needs to be added to properly dilute the waters for surface water discharge. Injection wells would provide the industry with the ability to dispose of waters from its phosphate operations at strategically located deep injection well sites instead of treating the water to best available technology, blending the treated water with well water, and discharging the blended water through a permitted outfall. If the underground injection control disposal method is proven to be technically viable, it would result in significant savings in treatment costs while protecting groundwater resources. The main hurdle to overcome with the method is the potential adverse reactivity of the injected treated water with the carbonate formations which is investigated here.</p>	<p style="text-align: center;">Unlocking the Total Value of Phosphogypsum</p> <p style="text-align: center;"><u>Patrick Zhang - Research Director, FIPR Florida Polytechnic University</u></p> <p>In collaboration with PNNL, Rutgers, ORNL and FIU, the FIPR Institute, Florida Poly secured a multi-year project through the Critical Materials Innovation (CMI) Hub (formerly Critical Materials Institute), funded by the U.S. Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy, Advanced Materials and Manufacturing Technologies Office. The project is designed to integrate recovery of critical elements into total utilization of phosphogypsum (PG) through complete recovery of the REE and P values, reduction of radionuclides, purification of calcium sulfate, production of an alternative fertilizer with CO2 sequestration, generation of inexpensive cement components, and manufacturing of low-carbon footprint cement. This paper presents some preliminary results from the first year of the CMI project. Detailed analysis of different size fractions indicated possible radioactivity reduction, REE recovery and PG upgrading by physical separation methods. REE leaching recovery of >90% was achieved by two different approaches. Calcium carbonate was successfully synthesized hydrothermally using untreated, leached and purified PG forms.</p>	<p style="text-align: center;">Advances in Using Sorgham as a Phosphate Rock Depressant</p> <p style="text-align: center;"><u>Elenice Schons</u></p>
Break			
3:20 - 3:50	<p style="text-align: center;">SWFWMD Lake Okeechobee Aquifer Storage & Recovery Well Program</p> <p style="text-align: center;"><u>Rick Cowles - PG - Stantec</u></p> <p>The Lake Okeechobee Watershed Restoration Project (LOWRP) is part of the Comprehensive Everglades Restoration Plan (CERP) planning effort, the largest hydrologic restoration project in U.S. history. Designed to improve water levels and water quality in Lake Okeechobee, LOWRP also will improve the quantity and timing of discharges to the St. Lucie and Caloosahatchee estuaries, increase the size and functionality of wetlands, and improve water supply for existing legal water users. Aquifer storage and recovery (ASR) well technology will be utilized to collect excess flows from the nearby surface water source during the wet season, treating the collected surface water to US EPA primary and secondary drinking water standards before recharging the aquifer via an ASR well. The treated water will then be stored until recovered during the dry season. A total of 55 ASR wells are planned, and each well is designed to recharge and recover about 5 MGD, with a total ASR wellfield capacity of 275 MGD of treated surface water to help fortify South Florida's ecology and surface water systems.</p> <p>An in-depth feasibility assessment led to the selection of two storage zones; Upper Floridan aquifer (UFA) and the Avon Park permeable zone (APPZ). In conjunction with the development of ASR well design, continuous core holes were advanced at select locations. Data from these core holes were used to refine design criteria and provided preliminary hydrogeologic data. Data interpretations from a series of four 5-day aquifer performance tests (APTs) at each site will aid in determining aquifer hydraulics and evaluate for leakage between aquifers. APT data will be input into a groundwater model to determine adequate well spacing between future ASR well pairs. Construction of a 10 MGD Demonstration Surface Water Treatment Plant (WTP) will facilitate future cycle testing and will be expanded to a 50-MGD. Once cycle testing is successfully completed, permitting for operation can begin.</p>		<p style="text-align: center;">Bench Scale and Pilot Plant Flotation Tests with Phosphate Rock from the Alto Paranaiba Region / MG Brazil</p> <p style="text-align: center;"><u>Dr. Andre Carlos Silva</u></p>

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3:55 - 4:25	<p align="center">Florida Water Model and the Central Florida Water Initiative</p> <p align="center">Chuck Drake - VP RSI Division - Tetra Tech (Virtual presentation)</p> <p>The presentation will provide an overview of two areas: Florida water law and the Central Florida Water Initiative. Florida water law is codified in Chapter 373, F.A.C. and called the Water Resources Act of 1972. Chapter 373 governs groundwater and surface water and states that all water in Florida is owned by the people of the state, and it is held in trust by the state. The state has regulatory authority to issue water use, also called consumptive use, permits to allow the withdrawal of groundwater or surface water if certain threshold criteria are met. Landowners in Florida don't have water rights as other states do. Chapter 373 created five water management districts that have four core missions: water supply, flood protection, water quality, and natural systems. The St. Johns River, South Florida and Southwest Florida Water Management Districts created the Central Florida Water Initiative (CFWI) to determine the allowable groundwater withdrawals such that no environmental harm would occur. The CFWI Regional Water Supply Plan (RWSP) was first written in 2015 and is updated every 5 years. It addresses water supply demands over a 20-year planning horizon and relies on groundwater flow modeling to estimate impacts to water resources if the traditional source of water supply, the upper Floridan aquifer, is used to meet most of the demands. Using minimum flows and levels (MFLs) and other constraints, the 2020 plan puts a limit of 720 MGD on withdrawals from the upper Floridan aquifer, the permitted withdrawals are approximately 1,050 MGD. Over the last 20 years, this has led to legislation and new laws requiring use of alternative water supply (AWS) sources, such as brackish groundwater and in some areas, the lower Floridan aquifer.</p>		

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Schedule	Room 100		
Thursday Morning October 10	General Session		
Thursday Afternoon October 10	General Interest		Analytical, Digitization, AI Process Control Kevin Sapp - Mosaic
1:30 - 2:00	<p style="text-align: center;">Complaint Protocols that Reduce Risk and Liability in Mining Operations</p> <p style="text-align: center;">Jeff Taylor - President - Sauls Seismic LLC</p> <p>Mining operations are rarely welcome or appreciated by neighboring citizens or communities. Citizen complaints are sure to happen, but many mining companies have allowed improper complaint responses to create permitting issues, mine shutdowns, serious litigation issues, etc. Company policies and protocols that fail to properly address initial complaints, along with lack of appropriate and thorough follow ups and final responses, are a prime stimulus that enflames the situation. These initial concerns or damage claims can quickly snowball into actual litigation, often resulting in class action lawsuits. Local officials attempting to implement overly restrictive regulatory measures can be another result as they attempt to appease their irate constituents. This presentation covers proven measures and protocols that companies can implement to ensure proper company actions, protocols, written responses and documentation of due diligence that greatly reduces their risk and liability. Having proper complaint protocols in place in the mine permitting and start up phases is ideal, but as long as mining operations continue and complaints happen improving pro-active company reaction is always smart.</p>		<p style="text-align: center;">Technologies to Digitize Conveyed Flow Quality for Real-Time Process Improvement in Phosphates</p> <p style="text-align: center;">Henry Kurth - Minerals Consultant - ScanTech International Pty Ltd</p> <p>Scantech has been supplying elemental and moisture analyzers to the phosphates industry since 2009. The technologies are primarily used for real time composition analysis of mined phosphate rock and feed to acid reactors to improve beneficiation and acid plant performance. Prompt Gamma Neutron Activation Analysis (PGNAA) is used for representative, full flow, continuous multi-elemental analysis. It is applicable to both conveyed flows and slurries and suited to fertilizer product analysis for nitrogen, phosphorus and sulfur measurement where needed. Microwave transmission is used for representative free moisture measurement and 3D infrared camera technology is used for particle size distribution, volume, belt speed and foreign object detection. The presentation will explain the technologies used, show examples of applications, and discuss benefits achieved by operations in various countries. Currently Scantech has analyzers installed in phosphates in North America, Latin America, Middle East and Northern Africa.</p>
2:05 - 2:35	<p style="text-align: center;">Hurricane Dorian's Impacts to the Grand Bahamas Island Ground Water Supply</p> <p style="text-align: center;">Robert Kirkner - President - Water & Earth Sciences, Inc</p> <p>Dorian was a strong Category 5 hurricane that struck Grand Bahama Island on Labor Day 2019. It stalled along the northern shoreline, raking the Island for 2 days with winds gusting to nearly 200 miles per hour. The Lucayan aquifer is the Island's source of water-supply, and it exists as a lens of fresh water floating on saline water below. The main wellfield east of town was overrun by a 20-foot storm surge. The surge also covered wellfields within the City of Freeport and collectively, made the ground water supply non-potable. An investigation was performed that included sampling and testing of new and existing wells, surface geophysical surveys, tide monitoring, aquifer performance testing and an evaluation of pre- and post-storm safe yield from the Lucayan aquifer. This limestone aquifer has properties similar to those observed at a recently studied limestone mine located near Florida's southeast coast. These properties posed challenges during the multi-phase investigation, but they also provide a level of protection against over-pumping from the supply wells. Ultimately, the investigation revealed new sources of supply, but a history of storm-surges and their cumulative effects prompted a switch to desalination.</p>		<p style="text-align: center;">Evolution in Geosynthetics Starts with Utilizing Data Technology</p> <p style="text-align: center;">Evan Bao - Vice President - GeoCaab</p> <p>This paper focuses on the automation of the geosynthetics installation QA/QC process by way of software integration in the field data entry and office data management. Technology is essential to the advancement of geosynthetic installations, especially data application. In its most basic form, data application is a means of gathering, storing, and utilizing information more easily than its predecessor(s). If implemented appropriately, data application technology improves process efficiency. Users and downstream stakeholders of process improvements can then capitalize by delivering quicker, higher-quality, more economical products. The geosynthetics industry is lagging in the area of data application. From a feasibility perspective and assessing practical implementation opportunities, many workflows widely used for tracking geosynthetic installations and its associated means and methods are antiquated and, furthermore, lack reliable authenticity verification. The current accountability requirements require a robust catalog of information reporting to substantiate this important environmental construction practice. The combination of room to evolve in practice and existing data requirements make the geosynthetics industry an ideal suitor for this technology integration. While advancements in materials manufacturing, welding equipment, and post-installation leak surveys already contribute to progress, there is a lack of universally accepted information infrastructure to aggregate all facets of an installation. Software automation create a cyclical geosynthetics ecosystem that benefits the industry as a whole.</p>
Break			
3:20 - 3:50			

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