

Wael R. Abdellah, Ph.D.**Personal Information**

Full-name: Wael Rashad Elrawy Abdellah
Gender: Male
Date of birth: August, 03rd, 1980
Place of birth: Sohag, Egypt
Citizenship: Egyptian
Language (s): Arabic (Mother-tongue), English (fluent), French (little)

Contact Information

Current Address: Department of Mining & Metallurgical Engineering, Faculty of Engineering,
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<http://minedesign.mcgill.ca/people.html> (McGill University)

Google Scholar link: <https://scholar.google.com/citations?user=UgZJZY8AAAAJ&hl=ar>

Tel: (+1) 519-694-3252 (Canada)

Education & Certificates

Ph.D., Mining Engineering Sept. 2010 – August 2013
Research Area: Rock Mechanics
McGill University, Montreal, Canada
Thesis: **Geotechnical Risk Assessment of Mine Haulage Drifts during the Life of a Mine Plan**
Supervisor: Professor **Hani S. Mitri**

M. Sc., Mining Engineering Sept. 2004 – July 2007
Research Area: Drilling Engineering
Assiut University, Egypt
Thesis: **Drilling Parameters in relation to penetration rates as a tool to predict the type of rock**
Supervisors: Professors Mostafa El-Biblawi, Mohamed A. Sayed & Mostafa T. Mohamed

B. Sc., Mining Engineering Sept. 1998 – June 2003
Assiut University, Egypt

Academic Position

Assistant Professor, Department of Mining and Metallurgical Engineering, Faculty of Engineering, Assiut University, February, 2014.

Assistant Lecturer, Department of Mining and Metallurgical Engineering, Faculty of Engineering, Assiut University, July, 2007.

Demonstrator, Department of Mining and Metallurgical Engineering, Faculty of Engineering, Assiut University, November, 2003.

Research Area (s)/Qualifications

Rock Mechanics

Physics and simulation of brittle spalling of hard rocks around underground excavations

Finite element and finite difference numerical techniques

Evaluation of the stability of mine developments with respect to mining sequence with focus on the haulage drifts and their intersections with cross-cuts

Constitutive behaviour of jointed rock masses

Advanced Numerical Techniques in Rock Mechanics

Employing deterministic analyses with stochastic methods (e.g. random Monte-Carlo, Monte-Carlo and Point-estimate methods) to predict spatially and temporally mine developments are due for enhanced support installation

Estimating the cost of consequences associated with the instability of underground mine developments

Establishing the geotechnical risk assessment scheme to decide when and where a secondary support is required with respect to planned mining sequences

Determining the ideal location of the haulage drifts with respect to mining methods and sequence

Estimating the stability of diminishing ore pillars, the probability of rockburst and fault slip occurrence

Field of Interest Themes

Rock Mechanics/Petroleum Rock Mechanics

Engineering Geology/Geosciences

Finite elements/Finite difference methods

Probabilistic/stochastic methods

Geotechnical risk assessments of underground structures

Computer skills

RocScience

FLAC/FLAC^{3D}

Rhino/Kubrix

Ansys

Abaqus

Publications

Articles in Journal

Wael R. Abdellah, Mamdouh Y. Hussein and Said S. Imbabi (2020). **Rock slope stability analysis using shear strength reduction technique (SSRT) – case histories**. **Mining of Mineral Deposits**. Vol. 14, No. (2), 16-24. <https://doi.org/10.33271/mining14.02.016>

Mohammed A. Hefni. **Wael R. Elrawy Abdellah**. Haitham M. Ahmed (2020). **Factors Influencing Stope Hanging Wall Stability and Ore Dilution in Narrow-Vein Deposits: Part II**. **Geotechnical and Geological Engineering**. 38, 3795-3813. <https://doi.org/10.1007/s10706-020-01259-9>

Wael R. Elrawy Abdellah. Gamal S. Abdelhaffez, Hussein A. Saleem (2020). **Stability assessment of underground openings using different rock support Systems**. **The Mining-Geology-Petroleum Engineering Bulletin (RGN zbornik journal)**. 35 (1), 49-64. <https://hrcak.srce.hr/234225>

Mahrous A. M. Ali. **Wael R. Abdellah**. Ahmed Abd El Aal. Jong-Gwan Kim (2020). **The Influence of the Physical and Mechanical Properties on the Abrasion Rate of Rocks along Idfo-Marsa Alam, Eastern Desert, Egypt**. **Geotechnical and Geological Engineering**. 38(2):1567–1577. <https://doi.org/10.1007/s10706-019-01112-8>

Wael R. Elrawy Abdellah. Mohammed A. Hefni. Haitham M. Ahmed (2020). **Factors Influencing Stope Hanging Wall Stability and Ore Dilution in Narrow-Vein Deposits: Part I**. **Geotechnical and Geological Engineering**. 38 (2):1451–1470. <https://doi.org/10.1007/s10706-019-01102-w>

Jong-Gwan Kim, **Wael R. Abdellah** and Hyung-Sik Yang (2019). **Parametric stability analysis of pillar performance at Nohyun limestone mine, South Korea— a case study**. **Arabian Journal of Geosciences**. 12:390. <https://doi.org/10.1007/s12517-019-4550-6>

Wael R. Abdellah, Haitham M. Ahmed and Mohammed A. Hefni (2018). **Numerical modelling of staged stope extraction in a tabular steeply dipping deposit**. **Geomechanics and Geoengineering**. 14(1), 41-51. <https://doi.org/10.1080/17486025.2018.1508856>

M.A. Sayed, G.Y. Boghdady, and **W.R. Abdellah** (2018). **Determination of the suitable drilling operating parameters in different geological formations El-Sharara Oil Field (south-western Libya)**. **Mining of Mineral Deposits**. 12 (3), 1-8. <https://doi.org/10.15407/mining12.03.001>

Wael Abdellah, Mostafa M. Beblawy, and Mostafa T. Mohamed (2018). **Evaluation of open pit slope stability using various slope angles and element types**. **Mining of Mineral Deposits**. 12 (2), 47-57. <https://doi.org/10.15407/mining12.02.047>

Wael Abdellah, Mahrous A. Ali, and Hyung-Sik Yang (2018). **Studying the effect of some parameters on the stability of shallow tunnels**. **Journal of Sustainable Mining**. 17(1), 20-33. <https://doi.org/10.1016/j.jsm.2018.02.001>

Wael Abdellah (2017). **Serviceability analysis of deep underground openings driven in jointed-rock**. **International Journal of Mining Science and Technology**. 27(6), 1019–1024. <https://doi.org/10.1016/j.ijmst.2017.06.024>

Mahrous A. M. Ali, **Wael Abdellah**, A. K. Abd El Aal (2016). **Drillability prediction using regression analysis for some Egyptian rocks**. **International Journal of Research in Engineering and Technology (IJRET)**. 5(10):138-149.

Wael Abdellah (2015). **Practical application of stochastic methods in geotechnical engineering.** **Journal of Engineering Sciences (JES).** Assiut University. 43(1), 57–70. DOI: 10.21608/jesaun.2015.115147

Wael Abdellah, Raju, D., Mitri, H. S., and Thibodeau, D. (2014). **Stability of underground mine development intersections during the life of a mine plan.** **International Journal of Rock Mechanics & Mining Sciences.** 72, 173–181. <https://doi.org/10.1016/j.ijrmms.2014.09.002>

Wael Abdellah, Mitri, H. S., Thibodeau, D. and Moreau-Verlaan, L. (2014). **Stability of Mine Development Intersections – A Probabilistic Analysis Approach.** **Canadian Geotechnical Journal.** 51(2), 184-195. <https://doi.org/10.1139/cgj-2013-0123>

Wael Abdellah, Mitri, H. S., Thibodeau, D. and Moreau-Verlaan, L. (2014). **Risk indexing tool for mine planning.** **Journal of the Southern African Institute of Mining and Metallurgy (SAIMM).** 114(6), 435-443. http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S2225-62532014000600009

Wael Abdellah, Mitri, H. S., Thibodeau, D. and Moreau-Verlaan, L. (2014). **Geotechnical Risk Assessment of Mine Development Intersections with respect to Mining Sequence.** **Geotechnical and Geological Engineering.** 32(3), 657-671. <https://doi.org/10.1007/s10706-014-9742-y>

Wael Abdellah, Mitri, H. S., Thibodeau, D. and Moreau-Verlaan, L. (2013). **Estimating Probability of Instability of Haulage Drift with Respect to Mining Sequences.** **Journal of Civil Engineering and Architecture.** 7(7), 887-896. 10.17265/1934-7359/2013.07.013

Wael Abdellah, Mitri, H. S., Thibodeau, D., and Moreau-Verlaan, L. (2012). **Stochastic evaluation of haulage drift unsatisfactory performance using random Monte-Carlo simulation.** **International Journal of Mining and Mineral Engineering (IJMME).** 4(1), 63-87. 10.1504/IJMME.2012.048000

Wael Abdellah, Mitri, H. S., and Thibodeau, D. (2011). **Assessment of Mine Haulage Drift Safety Using Probabilistic Methods of Analysis.** **Procedia Engineering.** 26(1), 2099 – 2111. <https://doi.org/10.1016/j.proeng.2011.11.2412>

M. M. EL-Beblawi, M. A. Sayed, M. T. Mohamed and **W. R. El-Rawy** (2007). **Some drilling parameters as a tool to predict different categories of rocks.** **Journal of Engineering Sciences (JES).** Assiut University. 35(4), 995-1008. http://www.aun.edu.eg/journal_files/14_J_9745.pdf

Conference/Proceeding papers

Wael Abdellah and Mitri, H. S. (2016). **Estimating the Probability of unsatisfactory performance associated with the instability of mine developments.** **3rd International Symposium on Mine Safety Science and Engineering, Montreal, Canada.** August 13-19, 84-89. <https://isms2016.proceedings.mcgill.ca/article/view/230>

Wael Abdellah (2015). **Haulage drift stability analysis- A sensitivity Approach.** **Proceedings of the 24th international mining congress of Turkey.** April 14-17, 499-507. http://www.maden.org.tr/resimler/ekler/bb17a0e751d1d74_ek.pdf

Wael Abdellah and Mitri, H. S. (2014). **Probabilistic stability analysis of mine haulage drifts in sublevel stoping system.** **12th International Conference on Mining, Petroleum & Metallurgical Engineering (MPM12), Suez, Egypt.** October 20th - 22th.

Wael Abdellah, Mitri, H. S., Thibodeau, D. and Moreau-Verlaan, L. (2013). **Stochastic Stability Analysis of Mine Developments with Respect to Planned Mining Sequence.** **23rd world mining congress, Montreal, Quebec, Canada.** August 11th-15th. Paper No. 170.

Wael Abdellah, H. Mitri, H. S., Thibodeau, D. and Moreau-Verlaan, L. (2012). **Estimating Probability of Instability of Haulage Drift with Respect to Mining Sequences**. **Proceedings of the 65th Canadian Geotechnical Conference- GeoManitoba2012, Winnipeg, Canada**. September 30 to October 03. G. Robinson and K. Bannister (Eds.). Paper No. 305, 1-5. <http://www.cgs2012.ca/accepted-papers.php?lang=en#s33>

Wael Abdellah, Mitri, H. S., Thibodeau, D. and Moreau-Verlaan, L. (2012). **Comparison of Two Failure Criteria for the Assessment of Haulage Drift Stability using Stochastic Analysis and Numerical modeling**. **Proceedings of 21st Canadian Rock Mechanics Symposium, RockEng12, Edmonton, AB, Canada**. May 5-9, Editor Chris Hawkes, Associate Editors, Derek Kinakin, Sam Proskin, Denis Thibodeau. 41-51. http://www.carma-rocks.ca/Rock_Engineering_Book.pdf

M. M. EL-Beblwi, M. A. Sayed, M. T. Mohamed and **Wael Abdellah** (2007). **Effect of Rotary speed and Weight on bit on drilling rate and Specific Energy Using Different rocks**. **10th International Mining, Petroleum, and Metallurgical Engineering Conference (MPM), Assiut, Egypt**. March 6-8.

Posters

Wael Abdellah, Hani S. Mitri, Denis Thibodeau, and Lindsay Moreau-Verlaan. **Comparison of Two Failure Criteria for the assessment of Haulage Drift Stability Using Stochastic Analysis And Numerical Modelling**. **21st Canadian Rock Mechanics Symposium, Edmonton, Alberta (AB), Canada**, May 5-9. 2012.

Wael Abdellah, Hani S. Mitri, and Denis Thibodeau. **Probability of drift failure due to nearby stope extraction**. **The Canadian Institute of Mining, Metallurgy and Petroleum (CIM). Montreal, Quebec, Canada**, May 2010.

Books

Wael Abdellah. **Geotechnical Risk Assessment of Mine Developments in Deep Metal Mines**. **VDM Verlag, Saarbrücken, Germany** (2015). ISBN: 978-3-659-67970-4. ISBN-13: 978-3-659-67970-4 ISBN-10: 3659679704. EAN: 9783659679704. Book language: English.

Hani S. Mitri and **Wael R. Abdellah**. **Applications of Finite Element Methods in Rock Mechanics**. **VDM Verlag, Saarbrücken, Germany** (2015). ISBN: 978-3-659-36806-6. ISBN-13: 978-3-659-36806-6. ISBN-10: 3659368067. EAN: 9783659368066. Book language: English.

Mostafa M. Elbeblawy, Hassan A. Elsageer, Mostafa Tantawy M., and **Wael R. Abdellah** (2021). **Surface Mining Technology**. **Topics in Mining, Metallurgy and Materials Engineering-Springer** (Awaiting publishing agreement).

Professional Experience

Research Experience

Postdoctoral Fellow (PDF)
University of McGill, Montreal, Canada

Sept. 2013 – August 2014

Tasks/Duties

Continue the research on the topic of haulage drift stability to examine and assess the validity of alternative stochastic techniques and rock failure criteria in order to more for better estimation of drift intersection stability performance.

Help in the supervision of undergraduate and Master's students, and participate in teaching activities in rock mechanics.

Evaluation of stope extraction scenarios in a diminishing ore pillar during the life of mine plan.

Application of hybrid finite difference method-probabilistic methods to mine development intersections in underground hard rock mines.

Research Assistant

Sept. 2010 – Aug. 2013

University of McGill, Mine Design Laboratory (MDL), Canada

Tasks/Duties

Define failure or unsatisfactory performance criteria. These will be examined by consideration of a) extent of yielding zones beyond the support anchorage length, b) spread of brittle shear failure around the haulage drift, and c) strength-to-stress ratio for mine intersections.

Use stochastic methods of analysis (e.g. PEMs, MCS and RMC), in combination with numerical modelling to quantify the probability of drift failure or unsatisfactory performance due to nearby mining activity.

Estimate the cost of consequences to choose the most economical solution when mine developments blocked or damaged.

Develop a geotechnical risk index for the haulage drift with respect to location (spatial) and mining sequence (temporal) on each level of the case study.

Research Assistant

Sept. 2003 – July 2007

University of Assiut, Egypt

Tasks/Duties

Estimating the most important physical and mechanical properties of the rocks such as density, porosity, compressive strength, tensile strength, Shear strength and coefficient of internal friction.

Monitoring drilling parameters such as weight on bit (WOB), rate of penetration (ROP), torque and drilling specific energy (SE) during drilling operations at two rotational speeds 300 and 1000 rpm using fixed laboratory-core drilling machine.

Development of a new dimensionless index Uniaxial Compressive Strength divided by specific energy (UCS/SE) to predict the type of rock.

Teaching Experience**Course Instructor**

Sept. 2013 – Dec. 2013

University of McGill, Department of Mining and Materials Engineering, Canada

Materials Handling (MIME 333). Fall 2013.

Topics: loading and haulage equipment, belt conveyors, rail haulage and hoisting systems.

Teaching Assistant

Sept. 2010 – Aug. 2013

University of McGill, Department of Mining and Materials Engineering, Canada

Material Handling (MIME 333). Winter 2011, 2012, and 2013.

Rock Mechanics (MIME 621). Summer 2011 and 2012

Finite Element application in Rock Mechanics (MIME 635). Summer 2012.

Mine Developments and services (MIME 426). Summer 2012 and 2013.

Stability of Underground Openings (MIME 521). Fall 2012.

Industrial Experience**Mining Engineer**

Sept. 2010 – Aug. 2013

Vale Company, Garson Mine, Sudbury, Ontario, Canada

During this period I had acquired experience in the following areas:

Design, development and implementation of computer applications such as mine design, mine modelling and monitoring mine conditions. More specifically, I worked on the following aspects of the project.

Evaluation of the stability of mine developments such as haulage drifts and cross-cuts with respect to mining sequences.

Building numerical models using different engineering analysis tools.

Application of probabilistic analysis techniques to estimate the probability of unsatisfactory performance or probability of failure of mine development intersections with respect to planned mining steps.

Calculation of the cost of consequence due to failure of mine developments.

Establishing risk-index matrices to help the ground control engineer estimate where and when secondary support is needed.

Instrumentations monitoring in the underground environment.

Delivering workshops to mining engineers and mine operators:

April 17-19, 2013: Industrial workshop Lecturer and Trainer (Applied Rock Mechanics for Underground Openings), McGill University, Montreal, Quebec, Canada. The Titles of lectures are: Topics: Ground Supports-1 & Estimating the Probability of failure of haulage drift.

April 18-20, 2012: Industrial workshop Lecturer and Trainer (Applied Rock Mechanics for Underground Openings). McGill University, Montreal, Quebec, Canada. The Titles of lectures are: Topics: Ground Supports-1; Numerical Modelling Considerations & Estimating the Risk of failure of haulage drift.

Professional Membership and Services

Member of Society of Mining Professors (SOMP) (<https://miningprofs.org/Members/Show/4636>).

Academic staff, University of Assiut, Egypt (http://www.aun.edu.eg/membercv.php?M_ID=893).

Member of Mine Design Lab, McGill University (<http://minedesign.mcgill.ca/people.html>).

Member of Journal of Engineering Science (JES).

Member of Egyptian Syndicate of Engineers (ESE), 2003.

Member of Egyptian Society of Engineers, 2003.

Awards & Scholarships

Books International Publication Award. University of Assiut, Egypt. 2015.

Postdoctoral Fellowship (PDF). Mine design lab, McGill University. Sept. 2013- Aug. 2014.

McGill Graduate Student Departmental Scholarship (MGSDS) for excellence in contributions to research, February, Canada, 2013.

Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Student Poster Award. Edmonton, Alberta, May, 9, Canada, 2012.

McGill Graduate Student Departmental Scholarship (MGSDS) for excellence in contributions to research, February, Canada, 2012.

Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Student Poster Award. Montreal, May, 24, Canada, 2011.

Hatch Graduate Fellowships in Engineering, Mining & Materials Engineering, McGill University, 2010-2011.

<https://www.mcgill.ca/engineering/students/graduate-students/funding/meda/named-fellowships/hatch>

McGill Engineering Doctoral Award (MEDA), Canada. Sept. 2010 – Aug. 2013

Mining and Metallurgical Engineering Conference Travel Award, University of McGill, Montreal, Quebec, Canada, 2012.

B. Sc. Honor Graduation Award, University of Assiut, Assiut, Egypt, 2003.

Excellence in Surface and Underground Mining Awards (Hamada Rashwan's Awards), University of Assiut, Assiut, Egypt, 2002.

Excellence in Engineering Geology and Structural Geology Awards (M. Rajaei El-Tahlawi's Awards), 2000 and 2001.

Scientific Journals' Reviewer

Rock Mechanics and Rock Engineering Journal (RMREJ)

Geotechnical and Geological Engineering Journal (GEGEJ)

International Journal of Environmental Science and Technology (IJEST)

J. Petrol. Science and Engineering (PSE)

Transportation Safety and Environment Journal (TSEJ)

Referees/References

[1] Prof. Hani S. Mitri, Ph. D., PEng.

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Montreal, Quebec, H3A 0E8
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[2] Dr. Lindsay Moreau-Verlaan, Ph. D., PEng.

Senior underground control engineer
Vale Ltd, Sudbury, Ontario, Canada P0M 1N0
E-mail: lindsay.moreau-verlaan@vale.com

[3] Dr. Denis Thibodeau, Ph. D., PEng.

Principal Consultant Rock Mechanics, Vale Base Metals Technology
Development, Vale Inco, CVRD-INCO. Ontario, Canada.
Senior Consultant Rock Mechanics at Stantec Consulting Ltd. Ontario, Canada.
Cell: 705 929-5769
E-mail: denis.thibodeau@stantec.com

[4] Dr. Atsushi Sainoki, Ph. D.

Associate Professor
International Organization for Advanced Research and Technology,
Kumamoto University, Japan
E-mail: atsushi_sainoki@kumamoto-u.ac.jp

[5] Prof. M. Hesham El Naggar, Ph. D., PEng.

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[6] Prof. M. F. Yassin, Ph. D.

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