H. JAMES LAW, PE, BCEE, LEED AP, SC, IWM

Education

M. Eng. - Geotechnical Engineering, University of Toronto, 1984

B. ASc. - Geo-Engineering, University of Toronto, 1983

Professional Licenses/Certifications

Professional Engineer- VA, MD, NC, ID, SC, and TX

American Academy of Environmental Engineers (AAEE) - BCEE Green Building Certification Institute (GBCI) - LEED AP BD+C

International Solid Waste Association (ISWA) - IWM International status Solid Waste Association of North America (SWANA) - SC:

Certified Manager of Landfill Operations (MOLO) and Leachate Management &

Bioreactor Landfills; NC Chapter - Certified Landfill and Transfer Station Operations Specialist

Professional Affiliations

American Society of Civil Engineers -ASCE-NCS Past Director & Geotechnical Committee Chair ISWA Honorary Board Member, Scientific Technical Committee (STC) member, Chair of Working Group on Landfill and Task Force on Closing Dumpsites Global Initiative

National Society of Professional Engineers - member SWANA - member

United States Green Building Council (USGBC) - member

Professional Experience

Mr. Law is a Vice President and Senior Geotechnical Engineer (SCS National Certified Program), and works in the Midlothian/Richmond, Virginia office. He has over 38 years of engineering, consulting, and management experience in: geotechnical engineering and subsurface soil investigation/exploration programs (including embankment and MSE Wall evaluation), solid waste management, landfill engineering and closure design, LFG blower and flare foundation design, geotechnical and geosynthetic/soil material testing and analysis, residentjconstruction engineering and construction quality assurance services, project scheduling and construction cost estimate, foundation bearing/settlement analysis and design, liquefaction analysis, static and seismic slope stability analyses using PCSTABL and GEOSTASE computer programs, seismic permanent displacement analysis, geosynthetic reinforced slope, embankment and pavement design, writing of geotechnical soil reports, and construction completion certification reports.

Mr. Law's solid waste management experience also includes landfill gas collection and utilization as alternate energy, LFG equipment procurement for overseas, material recovery facilities, solid waste transfer station facilities, aerobic bioreactor landfill remediation, bioreactor slope stability analysis, leachate recirculation evaluations in obtaining RD&D permit, and many other major permit amendments for alternate bottom liner (including final cover system) and leachate collection systems through performance equivalency demonstrations using HELP and MULTIMED modeling throughout US.

He served as a panel judge at the 2012 US EPA's Peer Review Panel Meeting for Grants: People, Prosperity, and the Planet - P3 - Phase II Competition in Washington D.C. for projects related to solid waste management, recycling and reused of materials, and the alternate renewable green energy

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sources. Since 2013, he served as a judge for the AAEES Excellence in Environmental Engineering & Science Awards E3 Competition, for entries in Research, Planning, Design, and Operations/Management categories. He has published papers at national and international conferences, as well as serving as a paper reviewer for the Editorial Board of the International Solid Waste Association (ISWA) on regular basis. His most recent publication is a text book titled: "The Waste Crisis - Roadmap for Sustainable Waste Management in developing Countries," co-authored with Dr. Sahadat Hossain and Dr. Araya Asfaw, published by Wiley-lSWA in 2022.

Mr. Law has worked on over 150 geotechnical engineering and solid waste disposal facilities throughout US states and countries including Argentina, Brazil, China, Chile, Columbia, Ghana, India, Israel, Lebanon, Malaysia, Puerto Rico, and Taiwan. Representative examples of his project experience include the following:

**Landfill/Geotechnical Engineering & Bioreactor/Leachate Recirculation**

**Atlantic County Utilities Authority (ACUA), NJ.** Performed HELP modeling to demonstrate that the head on liner after active leachate recirculation (ranging from 20,000 to 40,000 gallons per day) within the lined cell does not exceed the regulatory limit of 12 inches. Also performed slope stability analysis of a vertical and lateral expansion piggy-back cell area using PCSTABL program to verify that the factor of safety is adequate using waste shear strength properties after leachate recirculation.

**Brown Station Road Landfill Expansion, Prince George County, MD.** Provided technical advisory to Project Team and performed peer-review of the project specifications, specifically on slope stability analysis and evaluation of existing liner system tie-in and potential settlement concerns.

**Caminio Real Landfill, Dona Ana County, NM.** Performed obal slope stability analysis of interim and final slopes necessary for an RD&D bioreactor permit application in Unit 2 cell area liquid addition.

**Cortina Landfill, Cortina, CA.** Performed alternative liner system equivalency demonstration and slope stability evaluation for both static and seismic loading conditions.

**Frederick County Regional Landfill RD&D Permit, VA.** Evaluated the leachate head on liner with 100,000 gallons per day of leachate recirculation in a 5-acre cell area. Also performed landfill stability evaluation under bioreactor operation and successfully obtained approval of the first RD&D Rule permit in Virginia for leachate recirculation in a non-Subtitle D liner system landfill footprint area.

**Martone Landfill, MA.** Performed slope stability analysis using PCSTABL computer program developed at Purdue University to verify that the landfill slopes have an acceptable Factor of Safety (FS) during construction and operation of the leachate recirculation system. The slope stability analysis included both circular and block-type failure surfaces, with considerations given to potential seismic impacts and potential changes in waste mass properties with leachate recirculation.

**Page County Landfill, VA.** Performed geotechnical stability evaluation when considering leachate recirculation on a new cell using leachate collected from the existing leachate collection system.

**Prince William County Landfill, VA.** Performed 7-day leachate storage capacity estimation when considering leachate recirculation using **HELP** modeling for Phases II and Ill landfill area.

**Salt River Landfill, Scottsdale, AZ.** Performed leachate generation estimation and  obal slope stability analysis of interim and final slopes necessary for an RD&D bioreactor permit application in Phase VI area and liquids addition in Phase 1-V areas.

**Valencia Regional Landfill and Recycling Facility, Valencia, NM.** Performed  obal slope stability analysis peer-review of interim and final slopes necessary for an RD&D bioreactor permit application in Phases 2A and 3 liquid addition areas.

### Landfill Design, Permitting, Closure, and Construction Quality Assurnce

**Berkeley County Landfill Partial Closure, SC.** Performed geotechnical borrow material investigation and the borrow area sideslope stability evaluation. The material is to be used for the construction of partial closure of the lined landfill. Also evaluated technical feasibility of utilizing exposed liner and artificial closure turf technology by Watershed Geosynthetics, Inc.

**Eastern Landfill, Baltimore County, MD.** Project Manager for final cover system design. Evaluation final cover liner system and veneer stability analysis. Lead Designer and Geotechnical Engineer for designing closure grades and final capping system for a portion of this landfill. The work included evaluation of different geomembranes; ultimately, PVC was selected as the geomembrane that best met the project requirements. Reviewed all plans, specifications, and material quantity estimates.

**Fresh Kills Landfill Section 1/9, NY.** Performed veneer slope stability evaluation for the closure of the section, including a stormwater basin embankment's stability and settlement evaluation.

**Georgia Pacific Sludge Landfill Containment Berm and Slope Stability, Rincon, GA.** Inspected and evaluated sideslope and waste mound instability and subsidence during closure construction.

Disposed sludge materials became very unstable and very low shear strength with pore-water and gas pressure build-up from abnormal seasonal precipitation over a large plateau area that is not covered with impervious soil or graded to drain properly during operations.

**Great Oak Landfill, Asheboro, NC.** Managed and engaged a testing company in performing a dipole soil survey for liner leak detection on the entire primary liner below the protective soil cover. The system used the protective soil cover and GCL as conductive layers when testing the integrity of the primary geomembrane. Performed caisson inspection for the bridge foundation as well as the soil­ cement mixture and testing for the primary concrete access road subgrade.

**Hosier Road Landfill, Suffolk, VA.** Resident Engineer and project manager for the 40-acre landfill closure and a passive LFG collection system construction. Responsible for the construction quality assurance services and closure certification report.

**Kennametal Hazardous Metal Lagoon Closure, Bedford, PA.** Provided construction quality assurance services during the closure of the lagoon containing traces of complex metallurgical tungsten carbide powders, and other industrial by-products of manufacturing of metal cutting tools.

**Landfill Closure Construction and Remediation Projects (Carrs Mill, Alpha Ridge, New Cut LFs), Howard County, MD.** Project Manager and certifying engineer for three landfill closure construction projects. **Carrs Mill Landfill:** Project Manager for final cap design. Landfill closure features including final cap, passive gas control and groundwater remediation using pump and treat technology. The design covers an 8-acre municipal waste area closed in 1977 and a 0.25-acre former drum disposal area. Work included delineation of waste limits, soil cover thickness, estimated waste depth, estimates of long-term settlement, HELP modeling for leachate generation, and landfill gas and groundwater monitoring and testing. The site was graded and revegetated for passive end uses, which included a recreation park. **Alpha Ridge Landfill:** Geotechnical engineer and Task Manager for soil investigation program including stability and settlement analyses for the final cap design at the Alpha Ridge Landfill. The design of landfill closure features included a final cap, active LFG control with enclosed ground flare, and groundwater remediation using pump and treatment technology for

this 70-acre unlined landfill site. **New Cut Landfill:** Geotechnical Engineer and Task Manager for the final cap design. Closure features included a final cap, active LFG control using an enclosed ground flare, and groundwater remediation using pump and treatment technology for this 50-acre site. The work included delineation of waste limits, soil cover thickness investigations, wetlands mapping, review of historical information and gas and groundwater monitoring and testing.

**Merced County Hwy 59 Landfill Closure, CA.** Performed Global and cover system slope stability analysis for both the static and seismic stability analysis in preparation of responses to the Regional Water Quality Control Board (RWQCB) staff's review comments on a submittal related to the Final Partial Closure/Post-Closure Maintenance Plan (FPCPMP) for Phases 1 to 4 closure project.

**Oaks Landfill, Montgomery County, MD.** Owner's on-site representative and quality assurance engineer for the construction of the Oaks Sanitary Landfill Vertical Expansion. Responsibilities included review and evaluation of landfill slope and geosynthetic lining system stability; preparation of contract change orders and cost analyses; review of field and laboratory geotechnical and geosynthetic test data for conformance with the project requirements; review of quality control certification reports for completeness and accuracy; coordination with state and local regulatory agencies; and preparation of responses to contractors' requests for design clarification. Also served as the Certifying Engineer for Construction Quality Assurance services for the 140-acre closure project with the final capping system consisting of 40-mil VFPE geomembrane overlain with geocomposite drainage net material. The project also involved active landfill gas extraction components and general site grading. Project Manager for the evaluation of the existing 5.2 million­ gallon capacity leachate lagoons and possibly downsizing these leachate lagoons into smaller but manageable sizes. Reconstruction of the lagoons included soil berm, geosynthetic liner installation and repair, and piping appurtenances. Also served as the Project Director and Certifying Engineer during the reconstruction and reconfiguration of these lagoons.

**Page County Landfill, VA.** Performed geotechnical evaluation of existing landfill sideslope and leachate generation estimation at the sump area using HELP model. Evaluation included leachate estimation when a new cell was added to the existing leachate collection system and how to prevent leachate overflow at the leachate manhole pump station during a 25-year storm. Also worked on alternate liner demonstration for a major permit amendment using MULTIMED model, including leachate recirculation to increase LFG production.

**Possum Point Power Plant Slope Stabilization, VA.** Geotechnical Engineer for stabilization of a construction debris landfill slope on the Potomac River that has exhibited instability for nearly 20 years. The work involved field investigation of site conditions using Cone Penetrometer Testing and to evaluate shear strength of the construction waste, ground surveying to define topography and locate failure scarps, evaluation of high and low tide levels (all work had to be done above mean low water level), back-analysis of slope stability at failure conditions and development of stabilization methods using drilled piers. The slope stabilization used over 600, 30-inch diameter reinforced concrete shafts, installed through the waste and embedded 10 feet into underlying stable sands, as well as shoreline stabilization with large rip-rap rock and instrumentation such as slope inclinometers and settlement monuments. Construction is complete and the repairs have been fully approved by state and county regulators.

**Prince William County Landfill, VA.** Prepared the quality assurance/quality control plan for the closure of the existing Prince William County Landfill. Also designed soil investigation and test pad construction programs for closure and expansion projects at the landfill; Managed the task involving settlement evaluation and repair of a ballfield located atop of an old landfill; Managed a new cell construction to provide resident engineering and CQA services and engineer's construction cost estimate at, Phase I, Part 3 Construction project. Performed geotechnical obal and veneer slope

stability analyses and alternate liner demonstration for a major permit amendment using HELP and MULTIMED models for Phase II landfill site.

**Ralston Road Landfill, TX.** Performed obal slope stability evaluation to assess the stability of both the existing and proposed liner at the MSW landfill. The most critical conditions for stability during excavation, stability of the liner system, stability of exterior final mass waste, and stability of interim waste slopes were analyzed.

**Rinker Sand** & **Gravel Operations Pond Stability, Arlington County Pit, WA.** Performed slope stability analysis of the existing pond and the proposed pond expansion area with 2:1 sideslope, under both static and seismic loading conditions. Analysis included the stability of an adjacent elevated trail/old railroad and a state highway.

**Reichs Ford Road Landfill, Frederick County, MD.** Performed geotechnical evaluation involving  obal slope stability and settlement for a Phase Ill major permit amendment of the landfill Vertical Expansion project. Provided construction submittal technical review of a new cell construction (Cell 2B); Performed slope stability analysis for Site B Cell 2A alternate liner system proposed for the new cell construction. Evaluated the obal slope stability of the landfill by steepening of the permitted sideslope from 4(H):1(V) to 3(H):1(V) to regain some airspace in the existing cell; Managed and reviewed geotechnical site investigation programs and evaluation of Cell 3 design and a rubble fill closure design. Managed resident engineering and construction quality assurance services for the construction of Cell 3 and a rubble fill closure construction (including locating a yard waste compost facility atop the rubblefill landfill after closure).

**Riverhead Landfill Closure, NY.** Evaluated the veneer and  obal stability of the final cover system and assisted in selections of geosynthetic materials used for the project. Also provided consulting engineering services during closure construction.

**Rockingham County Phase 5 landfill Expansion, VA.** worked on a major permit amendment for the Rockingham County Landfill, VA, with specific tasks on:  obal and veneer slope stability analyses, leachate generation from alternate liner system using HELP model, and alternate liner performance demonstration using MULTIMED model.

**Rumpke Sanitary Landfill, OH.** Performed a comprehensive slope stability analysis and evaluation of the Southern Expansion areas and was responsible for a complete analytical report submitted to the Ohio EPA for approval.

**Shoosmith Quarry Landfill, Richmond, VA.** Served as geotechnical engineer to SCS's project team relating to the design and permitting of a solid waste landfill to be built within a 250 feet deep granite quarry. The work involved evaluation of quarry structural geology, including fracture/joint/weathering patterns, as well as design of unique side wall, mechanically stabilized embankment (MSE), and bottom liner systems to accommodate the irregular bedrock surfaces and sump systems for leachate collection.

**Sonoma County Central Disposal Site, CA.** Performed Global and cover system slope stability analysis for both the static and seismic stability analysis in preparation of the permit amendment application to the Regional Water Quality Control Board (RWQCB) related to the landfill expansion and Final Post-Closure Maintenance Plan (FPCPMP) for LF1 and LF2 and the Rock Extraction Area.

**Sullivan County Landfill Phase** II, NY. Evaluated the veneer and  obal stability of the final cover system and assisted in selections of geosynthetic materials used for the project. Provided engineering service and material submittal review during construction. Evaluated the stability of

multi-tiers sound barrier berms over the 3:1 sideslope using either MSW or soil materials.

**Sunrise Mountain Landfill, NV.** Performed overall site stability evaluation of an old valley-filled landfill including a passive LFG system.

**Tall Pines Disposal Facility, TX.** Performed obal and interim slope stability evaluation to assess the stability of both the existing and proposed liner at the MSW landfill. The most critical conditions for stability during excavation, stability of the liner system, stability of exterior final mass waste, and stability of interim waste slopes were analyzed.

**Tontitown Landfill, AR.** Peer-reviewed a permit document regarding geotechnical aspects of another consultant's design of a vertical and lateral expansion of an existing landfill.

**Washington County, MD, Forty West Sanitary Landfill.** Project Manager for the master plan design, Phase Ill permitting, Phase II boundary modification, and construction documents for a new 180-acre landfill. Included design of all landfill infrastructure, citizens drop off facility, final grading, base grading, bottom liner system, final cover system, slope stability and settlement evaluations.

Performed supplemental geotechnical and stability analyses, responded to MDE and public comments, attended public meetings, participated in pre-bid meetings, and provided engineering support during construction.

### Coal Combustion Ash Facilities and Power Stations

**Beijing Longteng Huachuang Environmental Energy** & **Technology Co. Ltd.** Provided Technical Advisory/Consulting Services to assist in the first unit of the Wet Electrostatic Precipitator (WESP) procurement from USA and installation at the Zhangqiu Power Plant in Zhangqiu City, Shandong Province.

**Coal Ash Landfill and Surface lmpoundment at various power stations, NC.** Provided a third-party geotechnical review of geotechnical reports (by others) and technical guidance to SCS's team involved in the inspection and evaluation of 23 coal ash disposal facilities in NC energy company. The work involved stability, drainage and hydraulic evaluations, and preparation of technical reports for ponds and dams.

### Solar Panel/ Alternative Energy Source Projects

**BCC Chemtura Solar Development, Naugatuck, CT.** Reviewed solar panel arrays foundation system, traffic loading, liner stresses and settlement evaluation at a Brownfields site.

**Beech Street Landfill Solar Development Design Review, Rockland, MA.** Reviewed solar panel arrays foundation system, traffic loading, liner stresses and settlement evaluation.

**Bernards Landfill Solar Development Design Review,** Bernards, NJ. Reviewed solar panel arrays foundation system and other landfill-related design aspects of the Bernards Landfill (Landfill).

**Florence Land Recontouring Landfill for Solar Photovoltic (PV) Panel System Development, Florence, NJ.** Reviewed settlement monument and existing available aerial topographic maps to then build a settlement spreadsheet model for predicting future settlement at any given time of interest along two sections. Settlement calculations was performed to estimate total and differential settlements due to: (1) solar PV panel array dead-loads and live-loads along these two sectional profiles; and, (2) continuing waste decomposition at two chosen time periods, i.e., first at the time of completion of the solar PV panel system installation and second, at a later time period selected by you, i.e., 10 years after.

## International Projects

**Battre Landfill, Salvador and Betim Landfill, MG, Brazil.** Performed peer-review of a MSE wall design for landfill expansion project. Also performed a  obal slope stability analysis assuming a deep­ seated failure surface below the MSE foundation.

**CTR-Rio Landfill, Brazil.** Performed proposal evaluation of procurement and installation of a permanent geomembrane leak detection system. Also provided recommendations based on US experience, pros and cons of such a system in a landfill environment, especially in a cost-benefit and technical and survivability points of view.

**Eff'e Landfill, Negev Desert, Israel.** Performed obal slope stability evaluation for the landfill using PCSTABL program. This work was performed under a teaming agreement with TahaI Consulting Engineers, Tel Aviv. The design is unique in that the landfill was located within a series of large stockpiles of mine tailings from nearby phosphate mining operation.

**Ghazipur Landfill, East Delhi, India.** Performed geotechnical evaluation for landfill slope failure on September 1, 2017, including multiple field trips and presentation to the East Delhi Municipal Corporation. Other relevant technical advisory activities included identifying potential waste filling areas to extend life of the landfill and dealing issues with landfill fires.

**Heishitou Landfill, Beijing, China.** Provided technical advisory support to a first aerobic bioreactor landfill remediation and stabilization of a closed landfill project in China. Tasked to assist in equipment procurement and exported from US to China as well as equipment joint-commissioning with various vendors. Also provided aerobic modeling to predict performance of waste stabilization and stability evaluation of the landfill, and provided a written guidance on operations and maintenance manual.

**Hiriya Landfill Rehabilitation, Tel Aviv, Israel.** Performed HELP modeling to demonstrate performance of various cap systems that cover over 100 acres (including end use consideration of a recreation park) and to evaluate slope stability using PCSTABL program for various slope configuration and soiljgeosynthetic material shear strengths. Also evaluated impact on factor of safety from seismic activities. The landfill, which is a prominent landmark in the area, now becomes the centerpiece of the Ariel Sharon Park. SCS teamed with Tahal Engineering, the largest civil engineering firm in Israel.

**Loma Los Colorados Landfill Expansion, Chile.** Performed geotechnical evaluation for landfill lateral and vertical expansion feasibility studies, including the  obal slope stability evaluation, leachate generation estimation, landfill gas generation estimation, and other relevant technical advisory activities.

**Norte IIIA+B Landfill Expansion, Argentina.** Performed landfill lateral and vertical expansion feasibility studies that include obal slope stability evaluation, airspace calculations, stormwater management, leachate generation estimation, leachate pump and holding pond capacity sizing, utility relocation, landfill gas generation estimation, and other relevant technical advisory activities such as final cap system utilizing geosynthetic clay liner material. Also evaluated a failed landfill operational slope with recommendations to improve the situations.

**Norte IIID Landfill Expansion, Argentina.** Performed new landfill vertical expansion feasibility studies that include obal slope stability evaluation, settlement, airspace calculations, stormwater management, leachate generation estimation, leachate pump and holding pond capacity sizing, landfill gas generation estimation, and other relevant technical advisory activities such as geosynthetic material selections and use of geosynthetic clay liner material placing Clay liner. Also

provided limited supervision and consulting services during construction of Phase 1, Cell A. Currently, evaluate technical feasibility of a new phase of lateral and vertical expansions of the landfill.

**Novo Gramacho Landfill, Brazil.** Performed evaluation of the previous slope failure of the existing landfill and used the results to re-evaluate its obal slope stability analysis of the same landfill that plans to fill 20m higher.

**Santher Industrial Landfill, Brazil.** Performed seismic obal slope stability analysis of a bio-reduced paper sludge waste landfill.

**Sao Joao Landfill, Brazil.** Performed slope stability analysis of a landfill slope failure due to liquid build-up and potentially from gas pressure build-up within the landfill. The work included modeling of the failure surface using PCSTABL, volume of waste involved, liquid levels and gas pressures. The area of the slope failure was repaired, and the facility is now closed.

**Slope Stability Evaluation of Alta Toa Landfill in Litigation Support, Puerto Rico.** Served as slope stability/landfill operations expert regarding tall and steep slope landfill operations that may trigger a rotational landfill slope failure. Services included evaluation of the site and landfill operations, slope configurations, leachate level, and providing a statement of professional opinion for slope stability under the conditions analyzed. The case recently has been settled.

**Subsurface Soil Investigation and Soft Clay Stabilization Projects, Sarawak, Malaysia.** Numerous commercial buildings, bridge embankments and highways projects in soft marine clay deposit.

Managed drilling crews and performed geotechnical site investigation, soil testing, geotechnical and foundation analysis, instrumentation installation and monitoring activities in various cities in the northern part of the Borneo Island (East Malaysia).

**Santher Industrial Landfill, Brazil.** Performed seismic obal slope stability analysis of a bio-reduced paper sludge waste landfill.

**Taichung City Landfill, Taiwan.** Construction and start-up of an active LFG collection system with three blowers and an enclosed flare system located in Taichung City, Taiwan, a Taiwan EPA pilot project on LFG collection and utilization. He was also responsible for the delivery and installation of the entire blowers and flare system designed by SCS Engineers.

**Zhangqiu City Power Plant.** Provided technical advisory/consulting services to evaluate proposal and make recommendations for selecting a winning US supplier for a multi-million-dollar air pollution equipment (wet electrostatic Precipitator) that would reduce emission of PM2.5 from 50 mg/m3 to 20mg/m3, for a coal-fired power plant in Zhangqiu City, Shandong Province, China.

# Publications

Law, **H.** James and Ross, David E. "Evolution of Municipal Solid Waste Management in North America." Waste Management & Research, Vol. 41(7) 1177-1187, July 2023.

Hossain, Sahadat, Law, H, James, and Asfaw, Araya. The Waste Crisis - Roadmap for Sustainable Waste Management in Developing Countries, Wiley - ISWA textbook publication, September 2022.

Alex Stege and Law, James. "Mini-Review of Waste Sector Greenhouse Gas and Short-lived Climate Pollutant Emissions in Tyre Caza, Lebanon, Using the Solid Waste Emissions Estimation Tool (SWEET)." Waste Management and Research 2022, Vol. 40(8), 1129-1142, August 2022.

Law, H. James and Ross, David E. "Importance of Long-Term Care for Landfills." Waste Management & Research, Vol. 39(4) 525-527, April 2021.

Agamuthu, P. and Law, H. James. "Do We Need Landfills?" Waste Management & Research, Vol. Vol. 38(10) 1075-1077, October 2020.

Law, James, et al. WGL Committee members. Directed and managed and authored a publication called "Landfill Operational Guidelines, 3rd Edition." ISWA Publication. October 2019.

Law, H. James and Ross, David E. "International Solid Waste Association's "Closing Dumpsites" Initiative: Status of Progress." Waste Management & Research, Vol. 37 (6) 565-568, June 2019.

Law, H. James, Glenn, A., Rey Nores, M. E., and Lucero, 0. "Expansion of an Active Landfill - a Case Study." ISWA World Congress 2016, Novi Sad, Serbia. September 19 - 22, 2016.

Lucero, Osvaldo, Rey Nores, Maria Eugenia, Ezequiel Verdini, and Law, James. "A Case Study of Drone Technology Application in Waste Management Facility." Global Waste Management Symposium sponsored by National Waste & Recycling Association and Environmental Research and Education Foundation, Palm Springs, CA, February 1-3, 2016.

Reed, Jeffrey, Elizondo, Marcos, and Law, James. "Design and Operational Considerations for Managing E&P Oil Field Waste in Municipal Solid Waste Landfills." Global Waste Management Symposium sponsored by National Waste & Recycling Association and Environmental Research and Education Foundation, Palm Springs, CA, February 1-3, 2016.

Law, H. James. "Major Parameters that Affect Outcome of Landfill Slope Stability Modeling." ISWA World Congress 2015, Antwerp, Belgium. September 7 - 9, 2015.

Lucero, Osvaldo, Rey Nores, Maria Eugenia, Ezequiel Verdini, Law, H. James. "Use of Drones on Landfills." ISWA World Congress 2015, Antwerp, Belgium. September 7 - 9, 2015.

Law, James. "Landfill Cover Veneer Stability: Key Considerations and Evaluations." 2014 SCS LF +

SMM Technical Guru Meeting, Kansas City, MO, September 19 - 20, 2014.

Law, H. James. "Impact of Leachate Level above Liner System on Slope Stability during Landfill Operation." 2014 ISWA World Congress, Sao Paulo, Brazil, 8 - 11 September, 2014.

Law, James, Isenberg, Robert, and Reed, Jeffrey. "Effects of Liquid Levels to Interim Slope Stability during Sustainable Landfill Practice." Global Waste Management Symposium sponsored by National Waste & Recycling Association and Environmental Research and Education Foundation, Orlando, FL, June 22-25, 2014.

Law, James, Goudreau, Michael, Fawole, Adedeji, and Trivedi, Mehal. "Maximizing Landfill Capacity by Vertical Expansion - A Case Study for an Innovative Waste Management Solution." 2013 ISWA World Congress, Vienna, Austria, 7 - 9 October, 2013.

Pantini, Sara, Law, James, Verginelli, lason, and Lombardi, Francesco. "Predicting and Comparing Infiltration Rates through Various Landfill Cap Systems Using Water- Balance Models - A Case Study." 2013 ISWA World Congress, Vienna, Austria, 7 - 9 October, 2013.

Law, James. "Sanitary Landfill Mining - Operational Interim Slope Stability Aspects." 2013 Sardinia Symposium, Cagliari, Sardinia, Italy, September 30 - October 4, 2013.

Law, James, Miller, Joseph, and Mccready, Ambrose. "Landfill Seismic Permanent Displacement Analysis: A California Case Study." Global Waste Management Symposium sponsored by National Solid Waste Management Association, Phoenix, AZ, October 1 - 3, 2012.

Law, James, and Ross, David. "Dump Site Redevelopment and Reuse: Technical Issues and Case Studies." 2012 ISWA World Congress, Florence, Italy, 17 - 19 September, 2012.

Law, James, Miller, Joseph, and Mccready, Ambrose. "Permanent Seismic Displacement Evaluation and Comparison of Methodologies." WasteCon 2012 Conference sponsored by SWANA, Washington, D.C., August 13-16, 2012.

Law, James, and Isenberg, Robert. "Evaluation of Slope Stability in Bioreactor Landfill Environment." 2011ISWA/KSWM World Congress, Daegu, South Korea, 17 - 20 October, 2011.

Law, James, Peterson, Eric, and Hudgins, Mark. "Water Requirements Estimates for an Aerobic Bioreactor Landfill in China." Proceedings Sardinia 2011, Thirteenth International Waste Management and Landfill Symposium, S. Margherita di Pula, Cagliari, Italy; 3 - 7 October, 2011.

Law, James, Hudgins, Mark, Su, Jun, and Peterson, Eric. "Water Requirements in an Aerobic Bioreactor Landfill Environment." Global Waste Management Symposium sponsored by National Solid Waste Management Association, San Antonio, TX, October 3-6, 2010.

Mccready, Ambrose and James Law. "Solving the Landfill Puzzle." WasteCon 2010 Conference sponsored by SWANA, Boston, MA, August 15-17, 2010.

Hudgins, Mark, James Law, David Ross and Jun Su. "The 'Sustainable Landfill' Becomes a Reality." Waste Management World Magazine, May-June 2010.

Law, James. "Bioreactor Landfills: Geotechnical Aspects of Stability Evaluation." ISWA Master Class on Sustainable Landfill Workshop, 2009 ISWA/APESB World Congress, Lisbon, Portugal, October 2009.

Law, James. **"HELP** Model - Demonstrating the Potential Impacts of Leachate Migration from Open Dumps." ISWA from Open Dumps to Sanitary Landfill Workshop, 2008 ISWA/WMRAS World Congress, Singapore, November 2008.

Law, **H.** James. "Closed Landfill End-Use and Redevelopment: Technical Considerations and Case Studies." 2007 City of Beijing Solid Waste Facilities & Material Handling, Recycling and End-Use Conference Proceedings, Beijing, China, June 6, 2007.

Isenberg, Robert H., H. James Law, Joseph **H.** O'Neill, and Raymond J. Dever. "Geotechnical Aspects of Landfill Bioreactor Design: Is Stability a Fatal Flaw?" SWANA 6th Annual Landfill Symposium sponsored by the Solid Waste of North America, San Diego, CA, June 18-20, 2001.

Law, **H.** James, Charles W. Leung, and Pat Lawrence. "Vertical Expansion -A case Study of a Seismic Permanent Displacement Analysis." SWANA 2nd Annual Landfill Symposium sponsored by Solid Waste Association of North America, Sacramento, CA, August 4-6, 1997.

Law, **H.** James, Charles W. Leung, and Robert Isenberg. "Impact of Landfill Slope Geometry on Slope Stability." 19th International Madison Waste Conference, University of Wisconsin-Madison, September 25-26, 1996, and the 1st Annual Landfill Symposium sponsored by the Solid Waste Association of North America, Wilmington, DE, November 4-6, 1996.

Law, H. James, Charles W. Leung, Paul A. Mandeville, and Arthur H. Wu. "A Case Study of Determining Liquefaction Potential of a New Landfill Site in Virginia by Using Computer Modeling." WasteTech 95 Technical Proceedings, New Orleans, LA, January 23-24, 1995.

Charles W. Leung, and Law, H. James. "Piggy-Back Landfill Expansions." 12th Annual Virginia Waste Management Conference Technical Proceedings. Richmond, VA, April 25-27, 1994.

Law, H. James & Charles W. Leung. "A Case Study of Slope Stability Analysis for Landfill Lining System." WasteTech 94 Technical Proceedings. Charleston, SC, 1994.

Charles W. Leung, and Law, H. James. "Landfill Design Considerations." 1993 VA and MD Landfill Seminar In-House Technical Proceedings. Richmond, VA, April 1993.

# Presentations & Training Workshops

2024 Congreso Internacional en Gestion de Residuos, Mexico City, Mexico. - Panelist presentation on "Management of Urban Solid Waste Final Disposal Sites (Landfills) in the United States." DS LATAM and Residuos Expo, March 5-7, 2024.

2024 ISWA-SWIS Winter School at UTA & City of Irving - Lecturer on geotechnical related topics on "Landfill Slope Stability Evaluation" and on "Landfill Gas to Energy and Utilization." January 15-26, 2024.

2023 ISWA COP28 in Dubai, UAE - Presenter on a side event "Task Force on Closing Dumpsites - Why Closing Dumpsites a Global Priority?" December 11, 2023

2023 ISWA World Congress in Oman - Panelist on "Panel discussion co-hosted by WG on Landfills and International Finance Corporation: Leveraging dumpsite closure opportunities to transition to sustainable waste treatment and disposal solutions" October 30 - November 1, 2023.

2023 ISWA-RMI "Key Strategies for Mitigating Methane Emissions from Municipal Solid Waste workshop," Lagos, Nigeria. - Lecturer on "Landfill Design and Operational Guidelines" & "Landfill Gas Capture." October 3-4, 2023.

2023 XXII Congreso Internacional en Gestion Integral de Residuos y Perspectivas Ambientales "Tendencias, Desafios y Opportunidades. - Presenter on "Landfill Design, Operational Guidelines, & New Technologies." Septiembre 27-29, 2023.

2023 ISWA-RMI "Key Strategies for Organic Waste Management Workshop," TERIGram Retreat Centre, Gwal Pahari, Gurugram, Delhi, India. - Lecturer on "Landfill Design and Operational Guidelines" & "Landfill Gas Capture." August 23-24, 2023.

2023 ISWA- ICWM CORE 2023 Global Conclave for Circular Economy and Sustainability, Jaipur, India. - Presenter on "Dumpsites, Biomining, Plastic Waste Reuses, Financing of Dumpsite Closure and Transitioning into Sustainable Waste Management Systems." March 13-16, 2023

2022 ISWA World Congress in Singapore - Presenter on "Global Closing Dumpsites Initiative Report: What Will be the Price everyone pays for Unmanaged Dumpsites?" September 21, 2022.

2022 ISWA-SWIS Winter School at UTA & City of Irving - Lecturer on geotechnical related topics on "Landfill Slope Stability Evaluation" and on "Landfill Gas to Energy and Utilization." June 6-17, 2022.

2022 SWANA SOAR Kansas City MO - Presented "How to Get Involved with ISWA's Global Initiative on Closing Dumpsites?" March 22, 2022.

2022 AWMA November Webinar - Presented "Progress and Challenges in International Solid Waste Management, Disposal & Greenhouse Gas Reductions" March 15, 2022.

2022 Global Waste Management Symposium sponsored by National Waste & Recycling Association and Environmental Research and Education Foundation, Palm Springs, CA - Presenter on "Update of ISWA Global Initiatives for Closing Dumpsites - A Recent Study." February 14-17, 2022.

2021ISWA World Congress Hybrid Conference in Athens, Greece - Presenter on "The Last Call: From Dumpsite Closure to Strategic Final Sinks in the Circular Economy," October 5, 2021.

2021ISWA-CCAC project, presented virtually on "Introduction to ISWA's Task Force on Closing Dumpsites, impacts of unmanaged waste and open dumpsites (global examples - slope failures)," "Dumpsite Rehabilitation - technologies and methodologies (with examples and case studies)," and "Landfill transitioning and operations." June 14-16, 2021.

2020 ISWA-CCAC project, presented virtually on "Closing Dumpsite Initiative & SWEET Model Results on Gas Emissions Quantification for Tyre, Lebanon." December 8, 2020.

2020 ISWA World Congress virtual Conference - Presenter on "Rethinking Waste - Task Force on Closing Dumpsites Initiative & Tyre Lebanon SWEET Modeling Results," September 22, 2020.

2020 SWANA Old Dominion Chapter -Sustainability in Solid Waste Management Training Webinar presented virtually on "ISWA's Global Impact on Sustainable Waste Management Practice." September 17, 2020.

2020 Global Waste Management Symposium sponsored by National Waste & Recycling Association and Environmental Research and Education Foundation, Palm Springs, CA - Presenter on "Overview of ISWA Global Initiatives for Closing Dumpsites." February 23-26, 2020.

2020 Special Lecture at the Department of Civil Engineering, North Carolina State University, Raleigh, North Carolina, USA, on "Overview of Solid Waste Management in Developing Countries." February 19, 2020.

2020 ISWA-SWIS Winter School at UTA & City of Irving - Lecturer on geotechnical related topics on "Landfill Stability and Landfill Settlement Evaluation" and on "Landfill Gas Collection System and Utilization." January 13-24, 2020.

2019 ISWA World Congress in Bilbao, Spain - Presenter on "ISWA's Task Force on Closing Dumpsites - Progress Status and Updates." October 7-9, 2019.

2019 ISWA-SWIS Winter School at UTA & City of Irving - Lecturer on geotechnical related topics on "Landfill Stability and Landfill Settlement Evaluation." January 14-25, 2019.

2018 ISWA Post-Congress Landfill Training Workshop on "Managing Landfills and Dumpsites in Developing Countries" in Kuala Lumpur, Malaysia - Presenter on "Landfill Dumpsite Stability." October 25, 2018.

2018 ISWA World Congress in Kuala Lumpur, Malaysia - Presenter on "ISWA's Task Force on Closing Dumpsites." October 22-24, 2018.

2018 ISWA-SWIS Winter School at UTA & City of Irving - Lecturer on geotechnical related topics on "Landfill Stability and Landfill Settlement Evaluation." January 15-26, 2018.

2017 ISWA World Congress in Baltimore, USA - Presenter on "Technical Problems and Challenges in Closing Open Dumps." September 25 - 27, 2017. Also served as a panelist on two curated technical sessions, discussion on "Closing Open Dumps and Landfills" and "Evaluating the Impact of Waste Management caused by the Changing of Waste Stream Composition."

2017 ISWA-WMAM Landfill Training Workshop in Malacca, Malaysia on April 5, 2017. Also gave a presentation at the WMAM Annual Conference on April 6, 2017 on "Landfill Stability Evaluation - Issues & Challenges."

2017 ISWA-SWIS Winter School at UTA & City of Denton - Lecturer on geotechnical related topics on "Landfill Stability and Landfill Settlement Evaluation." January 16-27, 2017.

2016 ISWA World Congress in Novi Sad, Serbia - Presenter on "Expansion of an Active Landfill - a Case Study." September 19 - 22, 2016.

2016 Global Waste Management Symposium sponsored by National Waste & Recycling Association and Environmental Research and Education Foundation, Palm Springs, CA - Presenter on "A Case Study of Drone Technology Application in Waste Management Facility." February 1-3, 2016

2016 ISWA-SWIS Winter School at UTA & City of Denton - Lecturer on geotechnical related topics on "Landfill Stability and Landfill Settlement Evaluation." January 18-29, 2016.

2015 ISWA World Congress in Antwerp, Belgium - Presenter on "Major Parameters that Affect Outcome of Landfill Slope Stability Modeling." September 7 - 9, 2015.

2015 ISWA World Congress in Antwerp, Belgium - Panelist speaker on ISWA Working Group on Landfill Training Workshop Program. September 7, 2015.

2015 SWANA Palooza in New Orleans, LA - Panelist speaker on ISWA Working Group on Landfill Training Workshop. March 16 - 19, 2015.

2014 ISWA World Congress in Sao Paulo, Brazil - Presenter on "Impact of Leachate Level above Liner System on Slope Stability during Landfill Operation." September 8-11, 2014.

2014 Global Waste Management Symposium sponsored by National Waste & Recycling Association and Environmental Research and Education Foundation, Orlando, FL - Presenter on "Effects of Liquid Levels to Interim Slope Stability during Sustainable Landfill Practice." June 22-25, 2014.

2013 ISWA World Congress in Vienna, Austria - Presenter on "Maximizing Landfill Capacity by Vertical Expansion - A Case Study for an Innovative Waste Management Solution." October 7-9, 2013.

2013 Sardinia Symposium, Cagliari, Sardinia, Italy - Presenter on "Sanitary Landfill Mining - Operational Interim Slope Stability Aspects." September 30 - October 4, 2013.

2012 Global Waste Management Symposium sponsored by National Solid Waste Management Association, Phoenix, AZ - Presenter on "Landfill Seismic Permanent Displacement Analysis: A California Case Study." October 1 - 3, 2012.

2012 WasteCon Conference sponsored by SWANA, Washington, D.C. - Presenter on "Permanent Seismic Displacement Evaluation and Comparison of Methodologies." August 13-16, 2012.

2012 ISWA World Congress in Florence, Italy - Presenter on "Dump Site Redevelopment and Reuse: Technical Issues and Case Studies." September 17-19, 2012.

2011ISWA/KSWM World Congress in Daegu, South Korea - Poster presenter on "Evaluation of Slope Stability in Bioreactor Landfill Environment." 17 - 20 October 2011.

2011Sardina Thirteen International Waste Management and Landfill Symposium, S. Margherita di Pula, Cagliari, Italy - Presenter on "Water Requirements Estimates for an Aerobic Bioreactor Landfill in China." 3 - 7 October 2011.

2010 Global Waste Management Symposium sponsored by National Solid Waste Management Association, San Antonio, TX. - Presenter on "Water Requirements in an Aerobic Bioreactor Landfill Environment." October 3-6, 2010.

2010 SWANA WasteCon Conference, Boston, MA. - Presenter on "Solving the Landfill Puzzle." August 15-17, 2010.

2009 ISWA/APESB World Congress, Lisbon, Portugal - Presenter on "Bioreactor Landfills: Geotechnical Aspects of Stability Evaluation." ISWA Master Class on Sustainable Landfill Workshop, 2009.

2008 ISWA/WMRAS World Congress 2008, Singapore. - Presenter on "HELP Model - Demonstrating the Potential Impacts of Leachate Migration from Open Dumps." ISWA from Open Dumps to Sanitary Landfill Workshop, November 2008.

## Book Author Publication

Hossain, Sahadat, Law, H, James, and Assfaw, Araya. The Waste Crisis - Roadmap for Sustainable Waste Management in Developing Countries, Wiley - ISWA textbook publication, September 2022.