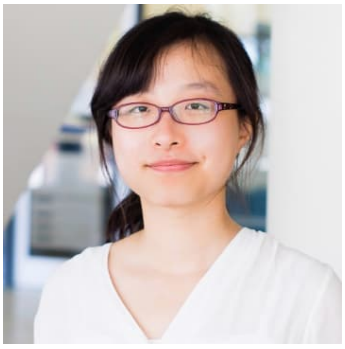
ARIA ZHANG, M.Sc., GIT

HYDROGEOLOGIST/GROUNDWATER MODELER



EDUCATION

M.Sc., Earth Sciences -Water
University of Waterloo, Canada, 2022

B.Sc. (Hon), Environmental Earth Sciences
University of Alberta, Canada, 2017

PROFESSIONAL REGISTRATION

Geoscientist-in-Training, EGBC

SUMMARY

Aria Zhang has an M.Sc. in Earth Sciences from the University of Waterloo, Canada with specialization in hydrogeology and geochemistry. She joined Robertson GeoConsultants Inc. in 2023. She has four years of experience related to mining hydrogeology, hydrogeochemistry and modeling.

Aria's knowledge and experience includes 3D transient flow and transport modeling using MODFLOW and MT3D, reactive transport modeling using MIN3P, variably saturated flow modeling using HYDRUS, tailings consolidation modeling using FSConsol, conceptual hydrogeological modeling, conceptual water and load balance modeling, mine waste characterization, and ARD remediation. She also has proficiency in Python, SQL, and ArcGIS/QGIS. She has published in peer-reviewed journals and presented at the BC MEND conference.

PROFESSIONAL HISTORY

2023-present:	Hydrogeologist/Groundwater Modeler, Robertson GeoConsultants Inc.
2020-2022:	Research Assistant, University of Waterloo, Waterloo, ON
2018-2020:	Environmental Data Technician, Matrix Solutions Inc., Calgary, AB
2017-2018:	Junior Environmental Scientist, Challenger Geophysical, Calgary, AB
2017:	Junior Geologist, CEPro Environmental Services, Calgary, AB
2016:	Research Assistant, University of Alberta, Edmonton, AB

PROJECT EXPERIENCE

MINING HYDROGEOLOGY AND MODELING

Rum Jungle Mine, NT, Australia (2025-present) for NT Government

- Simulated pit dewatering and backfilling, waste rock relocation, waste capping, and seepage control system operation for water and contaminant load predictions to support remediation planning and water treatment facility design and construction

Las Tortolas Tailings Impoundment, Chile (2023-present) for Anglo American Sur

- Updated numerical groundwater flow and transport model to Life of Mine (LOM) conditions under scenarios of seepage control measures to support long-term mitigation planning for the West Dam Sector
- Tailing consolidation and draindown simulations using FSConsol; tailings seepage prediction under various operational scenarios

- Updated model surfaces with stratigraphic information and geological modeling for the Main Dam Sector
- Main author of site-wide EIA report, including regional and site-wide geological and hydrogeological characterization, climate and hydrology, and site-wide conceptual water and load balance modeling for current and LOM conditions; reporting of numerical modeling and drilling and well installation programs for submission to DGA, SMA, and other Chilean regulatory agencies
- Pumping test and step test analysis and interpretation
- Developed custom Python scripts for model post processing, visualization, and reporting
- Responsible for project data and document requests, hydro-geochemistry database and geospatial data management

Myra Falls Mine, BC (2024-present) for Myra Falls Mine

- Data processing, assessment, and reporting for pumping well performance monitoring

Sandy Flat Mine, NT, Australia (2023-present) for NT Government

- Post-process and visualize transient groundwater flow and transport model for reporting
- Slug test analysis and interpretation

Faro Mine, Yukon (2023-present) for CIRNAC

- Field investigation, well development, water level survey, and water quality sampling

Bouchard-Hebert Mine, Quebec (2023-2024) for Breakwater Resources Ltd.

- Developed conceptual hydrogeological model (CHM), including geological cross sections and modeling, groundwater flow fields, groundwater and vibrating wire piezometer time trend analysis, and water and load balance model
- Supervised drilling and well installation; conducted field investigations, including well development, hydraulic testing, water level survey, water quality sampling, and tailings and waste rock sampling
- Pumping test and slug test analysis and interpretation with AQTESOLV
- Technical reporting for CHM and field programs

Langlois Mine, Quebec (2023-present) for Breakwater Resources Ltd.

- Developed conceptual hydrogeological model (CHM), including geological cross sections and modeling, groundwater flow fields, groundwater and vibrating wire piezometer time trend analysis, and water and load balance model
- Field investigation, well development, water level survey, water quality sampling, and tailings test pitting, logging, and sampling

MINING HYDROGEOCHEMISTRY AND REMEDIATION

Kam Kotia Mine, Ontario (2020-2022) for Ontario Ministry of Mines

- Field investigation, instrumentation, sampling, and monitoring of groundwater, pore water, and pore gas in a legacy tailings impoundment remediated with an engineered cover
- Laboratory characterization of the hydrogeological, geochemical, and mineralogical properties of mine waste, soil, and aqueous samples
- Variably saturated flow and gas transport modeling to assess cover performance using HYDRUS
- Reactive transport modeling with coupled thermo-hydrogeochemical processes using MIN3P

Sudbury Integrated Nickel Operations, Ontario (2022) for Glencore

- Field sampling, testing, and monitoring of seepage quality of a tailings impoundment remediated with municipal biosolids

- Field tracer test and sampling to evaluate a permeable reactive barrier (PRB) for groundwater remediation

Detour Lake Mine, Ontario (2021) for Agnico Eagle Mines Limited

- Field sampling, testing, and monitoring of water balance, seepage quality, and pore gas in waste rock piles

SITE ASSESSMENT AND REMEDIATION

Phase I/II Environmental Site Assessment and Contaminant Site Remediation (2018-2020) for Alberta Orphan Well Association, BC Oil and Gas Commission, Canadian Natural Resources Limited, Cenovus Energy, and Suncor Energy

- Processed borehole logs, water chemistry, soil quality, and hydraulic testing data; conducted statistical analysis and environmental searches
- Applied and modified environmental guidelines (Alberta Tier 1& Tier 2, BC CSR & site remediation protocols) based on site-specific conditions
- Managed EQuIS and Access databases, tracked project deliverables, and prepared reports

PUBLICATIONS AND CONFERENCE PRESENTATIONS

Performance of a Composite Cover at Kam Kotia Mine, ON – Hydrology, Gas Transport, and Geochemistry. *30th Annual BC MEND Metal Leaching/Acid Rock Drainage Workshop. Vancouver, BC.* December 6-7, 2023.

Zhang, A., Wilson, D., Ptacek, C. J., & Blowes, D. W. (2024). **Reactive transport modelling of tailings hydrogeochemistry under a composite cover**. *Journal of Contaminant Hydrology*. 261 (104290). https://doi.org/10.1016/j.jconhyd.2023.104290

Zhang, A., Bain, J. G., Schmall, A., Ptacek, C. J., & Blowes, D. W. (2023). **Geochemistry and mineralogy of legacy tailings under a composite cover**. *Applied Geochemistry*. 159(105819). https://doi.org/10.1016/j.apgeochem.2023.105819

Zhang, A., Bain, J. G., Schmall, A., Ptacek, C. J., & Blowes, D. W. (2023). **Seasonal hydrology and gas transport in a composite cover on sulfide tailings**. *Canadian Geotechnical Journal*. https://doi.org/10.1139/cgj-2022-0606