

10 July 2018

30 Forensic Engineering
40 University Avenue, Suite 800
Toronto, ON M5J 1T1

Dear 30 Forensic Engineering Recruiting,

I am writing to express my interest in a position at 30 Forensic Engineering in your environmental team. I previously worked in environmental consulting and have recently completed my PhD in Environmental and Geotechnical Engineering at the University of Cambridge which focused on the transport and remediation of contaminants in soil and groundwater. I am excited about the analytical and science-based investigation work at 30, and am eager to apply my skills and experiences on your important projects.

My combined experiences in environmental consulting and graduate research make me a great addition to 30. As an Environmental Engineer at Pattle Delamore Partners in Auckland, New Zealand, I conducted site investigations, as well as the design, construction and commissioning of various water and environmental management systems throughout the country. My work here involved extensive fieldwork investigation contaminated soils and water bodies, as well as the data analysis and interpretation of these findings. Major projects involved a combination of field and office work, such as conducting the site sampling, contaminants analysis, and hydrogeological modelling and design for the spreading of 3,500m³ landfill sludge to land near a major river, and carrying out site sampling and the process design for an upgraded wastewater treatment plant for a major sheep processing plant, among several other projects.

I gained further skills in contaminated site investigation through my PhD, where I attended the University of Cambridge as a Gates Cambridge scholar. Here, I designed biochar, a low-cost and carbon-negative adsorbent material, as an effective remediation tool. I developed a novel method of accounting for long-term remediation outcomes and showed that some practices currently being proposed are likely to result in short- and long-term leaching of contaminants, and demonstrated ways of designing biochar to manage this risk. This work has resulted in several peer-reviewed publications and presentations at international conferences, with three further papers in preparation. The combination of my consulting experience and state-of-the-art research into contaminant transport and immobilisation allows me to offer a unique perspective and excel in your diverse and talented teams.

I am particularly excited by the precise and collaborative approaches that 30 takes towards its projects. These approaches fit closely with my own experiences in producing peer-reviewed scientific publications, which require rigorous experimental design, data analysis and reporting. My academic experience allows me to bring the most current environmental science to 30, and to assist you in the assessment, management and remediation of contaminated sites. I believe that I can excel in your rigorous and science-based investigations, and am excited at the prospect of joining your teams.

I would appreciate the chance to discuss any opportunities available at 30. I am eligible to work in Canada under the IEC scheme, am available to start in mid August, and am willing to learn necessary regulations or additional technical skills prior to starting. Thank you for your consideration, and I look forward to speaking with you.

Yours sincerely,
Oliver McMillan

Oliver McMillan

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Clare College, University of Cambridge
Cambridge, United Kingdom
CB2 1TL

Environmental engineer with professional consulting and postgraduate research experience in the design of land remediation, wastewater treatment and stormwater management systems

EDUCATION

University of Cambridge, United Kingdom

Oct 2014 - Mar 2018

PhD in Environmental and Geotechnical Engineering

- Independently managed a 3-year research project which developed biochar as a sustainable and effective tool for immobilising organic compounds in contaminated soil
- Recipient of prestigious Gates Cambridge Scholarship - one of 55 students among ~3,700 applicants globally

University of Auckland, New Zealand

2011 - 2013

Bachelor of Civil and Environmental Engineering with First Class Honours

- Recipient of University of Auckland Chancellor's Award for Top Māori and Pacific Scholars (full scholarship)
- Completed four-year degree in three years on Accelerated Pathways program
- First in class for: Geomechanics; Environmental Engineering Design; Surface Water Quality Modelling
- GPA: 8.3/9 (A/A+ average)

CONSULTING EXPERIENCE

Environmental Engineer, Pattle Delamore Partners, Auckland

Nov 2013 – Aug 2014

Designed, constructed and commissioned wastewater, water resources and geo-environmental systems throughout New Zealand. Conducted field and office work, including: site investigations; contaminated soil, groundwater and surface water sampling; hydraulic and contaminant modelling; managing contractors and clients; preparing technical reports and engineering drawings; ensuring compliance with local and national regulations; preparing health and safety/risk assessments; budgeting and cost estimations.

- Conducted on-site soil and water quality sampling and interpreted data to design discharge scheme for 3,500 m³ hazardous landfill sludge without contaminating adjacent major river; Ngaruawahia, NZ
- Carried out on-site sampling, groundwater modelling, and system design for treatment, storage and discharge of 38,000 m³/year wastewater for new subdivision, including preparation of technical drawings; Orewa, NZ
- Advised on-site construction and commissioning of sewage treatment plant upgrade; Waiouru, NZ
- Conducted site sampling, options assessment, process design and cost estimations for wastewater treatment plant at a major sheep and lamb processing plant; Southland, NZ
- Designed site-wide stormwater management system for 4,000 person residential development in a decommissioned quarry; Three Kings, Auckland

RESEARCH EXPERIENCE

Biochar for remediating contaminated land (PhD project)

2014-2018

Designed biochar as a sustainable, in-situ material for remediating contaminated land

- Conducted extensive labwork and analysed and interpreted data to evaluate remediation potential and predict long-term outcomes of well-characterised biochar samples in contaminated soil
- Developed novel approach of analysing biochars and predicting contaminant transport which better accounts for real-world long-term outcomes and allows for more effective design of adsorbent materials
- Presented findings at two international conferences and currently preparing three papers for publication in peer-reviewed academic journals, in addition to five previous collaboration papers
- Peer-reviewer for journal *Science of the Total Environment*

Indigenous decision-making tools in engineering (Honours project)

2013

Used the Mauri Model, a New Zealand Māori decision making method, to account for cultural sustainability of Lake Rotoiti management and provide advice for future operation of floodgates

- Demonstrated that the preferred operation adversely impacted cultural values and excluded Māori stakeholders, and presented alternative option that was overall more sustainable

LEADERSHIP AND TEAMWORK EXPERIENCE

President, Clare College Graduate Society

Mar 2016 – May 2017

- Elected President to lead 19-member committee and represent graduate student community of ~300
- Organised a range of social, welfare and academic events from independently managed budget of £10,000
- Led negotiations with college on various issues on behalf of students, including reducing food prices by ~10%
- Assisted redesign and logistics of £40m college renovation and construction projects

Treasurer, Gates Cambridge Student Council

May 2017 – Nov 2017

- Elected Treasurer to prepare and manage annual budget of ~£80,000
- Successfully completed year in-budget and negotiated £1,000 additional funds for student support activities
- Redesigned accounts system to improve knowledge retention and accessibility of historical data

Bar Manager, Clare College Graduate Society

Apr 2015 – Mar 2016

- Elected manager of entirely student-run College bar which is open ~120 nights per year
- Co-ordinated and trained roster of approximately 25 staff to cater to up to 130 students per night
- Successfully managed budget of ~£15,000 to within £50 of target of being cost-neutral
- Managed liquor licensing and room maintenance on behalf of College

President, Engineers Without Borders: Auckland Students' Chapter

Oct 2012 – Oct 2013

- Elected President to manage and oversee national and international community engineering projects
- Founded educational series on development engineering featuring guest speakers from industry groups

Student Mentor, University of Auckland Māori Equity Office

2012 - 2013

- Mentored Māori and Pasifika students at the University of Auckland

SKILLS AND EXPERTISE

- 10+ years' experience using Microsoft Excel for data management, analysis, modelling of engineering systems
- 10+ years' experience using Microsoft Word for technical and academic report writing
- ~4 years' experience using GIS systems and databases for engineering design
- Experience working in the field including site investigations, construction and commissioning
- Proficient in Python, Matlab, R, HEC-HMS, AutoCAD for data analysis and engineering design
- Previously qualified to work on site, including First Aid certification (now expired)
- Languages: English (native); Spanish (conversational); French (beginner); Te Reo Māori (beginner)
- Valid and current driver's license with no infractions

PUBLICATIONS AND CONFERENCE PAPERS

McMillan, O.W.T. (2018) Characteristics and mechanisms of atrazine sorption to biochar for land remediation. PhD Thesis in the Department of Engineering, *University of Cambridge*, Cambridge, United Kingdom

McMillan, O.W.T., Shen, Z., Sigmund, G., Al-Tabbaa, A. (2018) Predicting long-term changes in sorption behaviour of biochar for atrazine and other organic contaminants (in prep)

McMillan, O.W.T., Shen, Z., Al-Tabbaa, A. (2018) Influence of feedstock, pyrolysis temperature and pH on sorption of atrazine to biochar for soil remediation (in prep)

McMillan, O.W.T., Al-Tabbaa, A. (2018) Modification and de-ashing of biochar and implications for sorption of atrazine (in prep)

McMillan, O.W.T., Al-Tabbaa, A. (2017) Sorption of atrazine by biochar – influence of pH and de-ashing, presented at *AquaConSoil Conference*, Lyon, France.

Shen, Z., Zhang, Y., Jin, F., **McMillan, O.W.T.**, & Al-Tabbaa, A. (2017). Qualitative and quantitative characterisation of adsorption mechanisms of lead on four biochars. *Science of the Total Environment*, 609, 1401 - 1410.

McMillan, O.W.T., Shen, Z.; Al-Tabbaa, A. (2016) Sorption mechanisms of atrazine to biochar, presented at *Asia Pacific Biochar Conference*, Gangwon Province, Republic of South Korea.

Shen, Z., Som, A. M., Wang, F., Jin, F., **McMillan, O.W.T.**, & Al-Tabbaa, A. (2016). Long-term impact of biochar on the immobilisation of nickel (II) and zinc (II) and the revegetation of a contaminated site. *Science of the Total Environment*, 542, 771-776.