



**Session 2: Chair: Will Gates**

|                 |  |    |
|-----------------|--|----|
| <b>10:40 AM</b> | <b>Keynote: <u>SA Wilson</u> and DL Bish</b><br>Stability of Mg-sulphate minerals in the presence of smectites: Possible mineralogical controls on H <sub>2</sub> O and nutrient cycling on Mars | 43 |
| <b>11:10 AM</b> | <b><u>G Taylor</u> and RA Eggleton</b><br>All pisolithic Bauxite deposits are transported – Really?  | 47 |
| <b>11:30 AM</b> | <b>RA Eggleton and <u>G Taylor</u></b><br>Glassy (Al,Fe) <sub>2</sub> O <sub>3</sub> in bauxites from the Southern Highlands of NSW  | 51 |
| <b>11:40 AM</b> | <b><u>R Gilkes</u>, S Tawornpruek and N Prakongkep</b><br>Corundum and hercynite in Bauxite from South Western Australia   | 57 |
| <b>12:00 PM</b> | <b><u>CT Henry</u>, MV Fey and MP Dobrowolski</b><br>Synthesis and characterisation of hydrotalcite from bauxite residue liquor and magnesium nitrate  | 63 |
| <b>12:20 PM</b> | <b>Lunch - Posters</b>   |    |

**Session 3: Chair: Jock Churchman**

|                |   |    |
|----------------|---|----|
| <b>1:20 PM</b> | <b>Keynote: AJ Mason</b><br>The development of the later stages of the Murray Basin and the development of the smectite (bentonite) clays                 | 67 |
| <b>1:50 PM</b> | <b><u>WP Gates</u>, Y Liu, R Martand Singh, and A Bouazza</b><br>Improving the swell index and fluid loss methods for compatibility testing of Bentonites | 69 |
| <b>2:10 PM</b> | <b><u>Y Liu</u>, WP Gates and A Bouazza</b><br>Effectiveness of polymers on improving the fluid loss of Bentonite used in geosynthetic clay liners        | 75 |
| <b>2:30 PM</b> | <b><u>Y Park</u>, GA Ayoko, and RL Frost</b><br>Thermal analysis of organoclays and application for water purification                                    | 79 |
| <b>2:50 PM</b> | <b><u>FL Theiss</u>, MJ Sear-Hall, SJ Couperthwaite, GA Ayoko, and RL Frost</b><br>Layered double hydroxides as iodine sorbents                           | 83 |
| <b>3:10 PM</b> | <b><u>LP Aldridge</u>, WP Gates, HN Bordallo and GJ Churchman</b><br>Water mobility in smectite   | 87 |
| <b>3:30 PM</b> | <b>Afternoon Tea - "The Hope Factor" book promotion</b>   |    |

**Session 4: Chair: Richard Cresswell**

|                |  |     |
|----------------|--|-----|
| <b>4:00 PM</b> | <b>Keynote: <u>MD Raven</u> and PG Self</b><br>Winning the 5th International Reynolds Cup Quantitative Mineralogy Competition  | 91  |
| 4:30 PM        | <b><u>B Pillans</u>, P Simmonds, W Hitchcock and B Alloway</b><br>Tektites, minitektites and microtektites from the Kalgoorlie region, Western Australia                 | 95  |
| 4:50 PM        | <b><u>M Thomas</u>, T Cudahy and M Cacetta</b><br>Recent developments in ASTER Geoscience products for Australia   | 99  |
| 5:10 PM        | <b>B Fritz, C Noguera, A Clement and <u>H Zwingmann</u></b><br>Illite authigenesis - new constrains on fundamental clay crystallization processes using the NANOKIN code | 103 |
| 5:30 PM        | <b><u>MS Žbik</u> , RL Frost, Y-F Song and C-C Wang</b><br>Synchrotron based Transmission x-ray microscopy reveals smectite fine structure in an aqueous environment     | 105 |
| <b>5:50 PM</b> | <b>ACMS AGM</b>  |     |

**Wednesday 8 Feb**

**Mid-Conference field trip to Lake Mungo and Arumpo Bentonite mine operations**

|          |   |
|----------|---|
| 6:45 AM  | Depart Mildura (in front of Arumpo Bentonite Offices on Deakin street – same block as conference venue) |
| 8:15 AM  | Mungo National Park tour  |
| 12:15 PM | Lunch at Mungo Lodge  |
| 2:00 PM  | Arumpo Bentonite mine   |
| 4:00 PM  | Depart for Mildura  |
| 5:30 PM  | Arrive Mildura (in front of Arumpo Bentonite offices on Deakin Street)                                  |

*Dress should be suitable for a day in the sun: good shade-producing hat, long-sleeved shirt, long pants, sturdy shoes and sun cream*

**Conference Dinner**

6:30 to 6:45 PM For departure from Mildura wharf

Return to Mildura wharf approximately 10:30 PM

The Conference Dinner will be a leisurely sunset cruise along the River Murray on the [PV Rothbury](#). Dinner will be carvery style with drinks available at the bar.

After dinner Tony Hope will present his recollections on the topic of “Exploration successes under cover in the Murray basin: The Arumpo bentonite and Ginkgo heavy mineral deposits.”

**Thursday 9 Feb**

**Session 5: Chair: Balwant Singh**

- 8:30 AM**     **Keynote: MJ Kennedy**  
Are clay minerals a fundamental biogeochemical regulator of the Biosphere at Earth system scales 111
- 9:00 AM     **SC Löhr, MJ Kennedy, J Brugger and B Etschmann**  
The role of mineral surfaces in the preservation and transformation of organic carbon: meso- to nano- scale spatial complexity of organic matter forms in organic-rich shales 113
- 9:20 AM     **GJ Churchman, AD Noble and DJ Chittleborough**  
Additions of clays and clay minerals to enhance the sequestration of Carbon in soils 117
- 9:40AM     **Y-T Huang, GJ Churchman, DJ Lowe, NJ Rawlence, L Schipper and A Cooper**  
Evaluating the character and preservation of DNA within allophane clusters (microaggregates) in buried soils on Holocene tephra, northern New Zealand 121
- 10:00 AM     **E Yusiharni and R Gilkes**  
The forms of plant nutrient elements in Australian native plant ash derived from several species and the incubation effects on soil 125
- 10:20 AM**     **Morning tea - Posters**

**Session 6: Chair: Keith Scott**

- 10.40 AM**     **Keynote: DJ Gray, RRP Noble and N Reid**  
Advances in understanding regional hydrogeochemical patterns in Australia 129
- 11:10AM     **P Shand, AJ Love, T Gotch, MD Raven and S Priestley**  
Extreme acidic environments associated with carbonate Mound Springs: the western Great Artesian Basin 133
- 11:30AM     **I Bibi, B Singh and E Silvester**  
Dissolution of clay sediments in acid-sulfate systems 137
- 11:50AM     **V Wong, SG Johnston, ED Burton, RT Bush, LA Sullivan, PG Slavich**  
Will sea-level rise solve our coastal acid sulfate soil issues? 143
- 12:10PM**     **ARGA AGM**
- 12:40PM**     **Lunch - Posters**

**Thursday 9 Feb (continued)**

**Session 7: Chair: John Keeling**

|         |  |     |
|---------|--|-----|
| 1:30PM  | <b><u>RW Fitzpatrick</u>, MD Raven, PG Self, P Shand, L Mosley, S Simpson and A Baker</b><br>Occurrence, genesis and environmental significance of schwertmannite in re-flooded Acid Sulfate Soils in the Lower Murray Reclaimed Irrigation Area | 147 |
| 1:50PM  | <b>I Bibi, <u>B Singh</u> and E Silvester</b><br>Inland wetlands with sulfidic sediments provide ideal conditions for Akaganéite formation   | 153 |
| 2:10PM  | <b><u>A Marchuk</u> and P Rengasamy</b><br>The nature of clay-cation association dictates clay behaviour in aqueous suspensions  | 155 |
| 2:30 PM | <b><u>S Marchuk</u>, P Rengasamy and GJ Churchman</b><br>Cation exchange as influenced by the type of cations in different clay minerals   | 159 |
| 2:50PM  | <b>B Newman</b><br>River Murray salinity management and irrigation   | 163 |
| 3: 10PM | <b>R Cresswell</b><br>Banrock, Bockpurnong and Chowilla - approaches to management of the Murray River water quality   | .   |
| 3:30 PM | Closing remarks  |     |
| 3:40 PM | <b>Afternoon Tea</b>   |     |

**Friday 10 Feb**

**Post-Conference field trip to the Murray Riverland**

|          |   |
|----------|---|
| 7:00 AM  | Depart Mildura (from Quality Grand Mildura Hotel) |
| 9:00 AM  | Chowilla Floodplain                               |
| 12:00 PM | Banrock Station wetlands and lunch                |
| 2:00 PM  | Bookpurnong Salt Interception Scheme              |
| 6:00 PM  | Arrive Mildura                                    |

*Dress should be suitable for a day in the sun: good shade-producing hat, long-sleeved shirt, long pants, sturdy shoes and sun cream*

**Notes**