Reservoir understanding and prediction in Evaporite Geosystems
(12-day field course)

Join your trip experts, Dr. John Warren and Dr. Ian Dyson, in experiencing first
hand the diversity and economic significance of systems and sequence anal-
ysis in Australia’s evaporite geosystems (modern and ancient). This 12-day
combined field and lecture course capture the diversity and geological im-
portance of textures in saline depositional systems across the world famous
regions of the Coorong, Marion Lake, Lake Eyre and the Flinders Ranges, as
well core-based study of facies distribution and architecture.

OBJECTIVES
• Better appreciate implications of saline stacking and halokinetic patterns
  in terms of reservoir and non-reservoir distribution, their architecture, the
  heterogeneity and quality of reservoir in an evaporite sequence framework.
• Integrate different scales of observation and interpretation from outcrop, to
  core, to wireline, to seismic scale.
• Development- and production-scale modelling of facies distribution, stack-
  ing patterns, bed-scale stratigraphy, and the hierarchy of architectural ele-
  ments within distributive saline depositional, halokinetic and diagenetic sys-

Lectures
• Evaporite textures in a depositional and diagenetic framework
• Brine hydrology and geochemistry drive diagenesis
• Ancient evaporites - why only partial Quaternary analogues
• Halotectonics, welds and poroperm prediction

Oil and gas accumulations in evapo-
rite-entaining basins

DESTINATIONS
• Modern Coorong carbonates.
• Modern stromatolites tepees and bedded sulphates of the Marion
  Lake/Deep Lake/region.
• World-class salt pans and bajadas of Lake Eyre and Lake
  Torrens (overflight)
• Ancient saline geosystems of the
  Flinders Ranges.

TRIP LEADERS
Dr John K Warren is a well-known
evaporite expert with more than 30
years experience in saline geosys-
tems. He has written four books and
numerous papers on this subject.
Currently, he is a consultant to a
variety of international oil, potash and
mineral exploration companies.

Dr Ian Dyson is a clastic sedimen-
tologist and stratigrapher who for 25
years has studied salt diapirs, sedi-
mentation, and associated structural
evolution in the Flinders Ranges,
South Australia and the Amadeus
Basin in Central Australia. This work
culminated in the sponsored develop-
ment of exploration models suitable
for use in, circum-Atlantic salt basins,
the Red Sea and offshore Mauritania.

ACTIVITIES
In addition to 4.5 days of lectures on
applied evaporite sedimentology, we
visit sedimentary sequences encom-
passing modern & ancient evapo-
rite systems. We overfly world-class
modern continental playas of Lake
Eyre and reservoir scale analogues
in the Peake and Denison Ranges.
We will study internal architectures,
sedimentary structures, and reservoir
geometries in a regional evaporite
framework. We’ll also visit a local core
laboratory to compare regional salt
cores with field exposures.

AUDIENCE
Petroleum geologists, general geol-
ogists, sedimentologists, reservoir
modelers, reservoir engineers, seismic
interpreters.

SaltWork Consultants Pte Ltd
Expertise across saline geosystems
www.saltworkconsultants.com
Itinerary (12 days in total)

Day 0 Arrival in Adelaide
Check-in at Rydges-South Park, located Cnr West and South Tce Adelaide

Day 1 In-house lectures
Introduction to Evaporites; Textures and hydrological associations

Day 2 Field visit to Coorong Lakes in Salt Creek region (SE of Adelaide)
Hydrologies and mineralogies in modern and ancient estuary/barrier bar; lake geochemistry; Milne Lake; Pellet lake, protodolomite, yoghurt mud textures; tepees and capillary evaporation

Day 3 In-house lectures
Subaqueous and sabkha hydrologies and textures, stromatolites, tepees, cement and overprints as basin-scale drawdown vs capillary recharge indicators

Day 4 Field visit to Marion Lake, Stenhouse Bay region, Yorke Peninsula
Marine geosystem models and sequence understanding over deep time in a plate tectonic framework

Day 5 (am lecture) (pm core library)
(AM lecture) Officer Basin Geology; continental lacustrine (trona/shortite) versus sulphate and halite sabkha/pan
(PM core library) Cores from the Officer Basin will be studied

Day 6 Depart Adelaide and drive to Leigh Creek
All-day travel, with evening arrival and check into accommodation at Leigh Creek Hotel

Day 7 Flyover ex Leigh Crk Airport: Lake Eyre, Lake Torrens, Peake & Denison Ranges
Lake Eyre; Salt basins, Warburton Channel; Neales River Delta, Dunes (sulphate versus quartzose sands), Estuarine sabkha (tidal signatures in a continental basin)

Peake & Denison Ranges: Dead Sea analogue, pre-rift geometries

Day 8 In-house lecture
Salt tectonics, Longterm salt cycling, Regional (seismic scale) halokinetic reservoir predictors

Day 9 Beltana Diapir
Salt withdrawal mini-basins, allochthonous salt tongues; salt welds; subsalt reservoirs

Day 10 Beltana Diapir and Patsy Springs Canyon
Salt-sediment interaction suprasalt; Shallow marine facies; Deep-water cyclic-ity

Day 11 Depart Leigh Creek
Drive to Adelaide (all-day travel) with overnight at Rydges

Day 12 Depart Adelaide

Course Materials
All participants will receive a digital copy of all course materials, including all slides and a copy of Dr Warren’s latest (2016) book on evaporites. In addition, hard copies of field course notes will be provided.

Accommodation and Meals
Days 0-5 and Day 11: Stay at Rydges South Park, downtown Adelaide, located at the corner of West and South Tce (7 nights).
Days 6-10: Stay at Leigh Creek Hotel (5 nights)
Days 1-11: All meals and coffee breaks are catered, and included in per-participant cost.

Other Aspects
Per participant cost varies according to the number of participants (minimum of eight, maximum of sixteen). Lake Eyre flyover cost is included in total price, unless requested otherwise. All field vehicle hire costs, all audio-video equipment and all training room and core layout costs will be included in the course cost.

Course Duration
The course begins and ends at Rydges Hotel-South Park, Adelaide. All participants are responsible for their travel costs (airfares, taxi, bus etc.) in getting to and departing from Rydges-South Park.

SaltWork® Geology Field Course
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