

## N532: Aeolian and Dryland Fluvial Reservoirs: Field and Virtual Outcrop (*Elgin, UK*)

Format and Duration  
Field - 3 Days

Instructor(s): John Howell

---

### Summary

This course provides an overview of aeolian and dryland fluvial deposits as analogues for Rotliegend reservoirs in the Southern North Sea. The course will focus on the geometry and architecture of the various depositional elements and how they can be captured in static and dynamic models. The course will include a mixture of outcrops from the Hopeman Sandstone of northeast Scotland and virtual outcrops of selected systems from Utah. An example of a Utah virtual outcrop can be viewed at <https://v3geo.com/model/111>

**Business Impact:** This multi-disciplinary course offers a highly **applied field-based experience** for geoscientists, petrophysicists, and reservoir engineers involved in **developing descriptions and models** of Rotliegend reservoirs.

### Learning Outcomes

Participants will learn to:

1. Identify the key facies in outcrop, core and well logs.
2. Understand their geometries away from wells.
3. Consider correlation at the inter-well scale.
4. Understand petrophysical trends within the facies.
5. Learn how to incorporate the architectural elements into static and dynamic geomodels, including the application of multiscale modelling and REV if appropriate.
6. Consider uncertainty at all scales within the reservoir description and geomodelling workflows.
7. Understand the impact of structure on aeolian and sandy fluvial reservoir systems.
8. Demonstrate the use of outcrop analogue data for building better reservoir models.

### Training Method

A field course on the coast of the Moray Firth in northeast Scotland, based in Elgin. Time will be subdivided 50:50 between the classroom and the field. Classroom time will be equally divided between short lectures on the fundamentals and virtual field trips to Utah to see a wide range of outcrops. The Virtual Outcrops component will be delivered via LIME, a purpose built software and will utilise our unique collection of virtual outcrop data, augmented with information collected over 25 years of study.

### Physical Demand

The physical demands for this class are **LOW** according to the RPS field course grading system. Basic fitness is required. The longest walk on the field course is approximately 3 km (1.8 miles) along a cliff-top track. Other short walks of up to 1 km (0.6 miles) take in beach sections. Transport is by coach on paved roads.

---

## N532: Aeolian and Dryland Fluvial Reservoirs: Field and Virtual Outcrop (*Elgin, UK*)

Format and Duration  
Field - 3 Days

Instructor(s): John Howell

---

### Who Should Attend

This multi-disciplinary course is designed for geoscientists, petrophysicists, and reservoir engineers involved in developing descriptions and models of Rotliegend reservoirs.

### Course Content

The course content is subdivided into three basic components: i) fluvial sediments, ii) aeolian sediments, and iii) fault impact, although there will be a degree of overlap between the sedimentology and the structure.

A typical day will start with a short classroom presentation to introduce the key aspects to be covered, followed by a field session to allow hands-on interaction with the rocks, making observations and interpretations at core to near-well-bore scales. This will be followed by a return to the classroom for the relevant Virtual Outcrops (2-3 hours). The virtual outcrops from Utah are typically much larger, allowing inspection of the facies architectures and geometries at the inter-well and gas field scale.

#### Day 0: Arrival

- Arrival in Aberdeen and transfer to Elgin (2 hours)

#### Day 1: Styles of aeolian dune system and implications for reservoir geometry and barriers

- Classroom introduction to the course and HSSE briefing
- Classroom introduction to aeolian systems
- Field: Outcrops between Hopeman and Covesea
  - Looking at small-scale climbing dunes and comparing to larger slipface less bedforms
  - Soft sediment deformation and the Weissliegend
  - Focus on identification of facies and the role of bedform architecture on production
- Classroom: Virtual Outcrops from Utah
  - Looking at wet vs dry systems, comparing the Entrada Sst with the Page Sandstone
  - Reservoir modelling at the dune bedform scale, heterogeneities at the inter-well scale
  - REV and upscaling

#### Day 2: Arid Fluvial Systems

- Classroom introduction to the fluvial systems in arid settings
- Field: Outcrops at Burghead
  - Contrast facies to aeolian from previous day
  - Bedforms, geometries and architecture - sheetfloods vs more channelized deposits
  - Heterogeneities to flow in arid fluvial systems
- Classroom: Virtual Outcrops from Utah
  - Looking at a variety of arid fluvial systems

**N532: Aeolian and Dryland Fluvial Reservoirs: Field and  
Virtual Outcrop (*Elgin, UK*)**

**Format and Duration**  
Field - 3 Days

Instructor(s): John Howell

---

- The interaction between aeolian and fluvial deposits in the Cutler

**Day 3: Structural interactions with fluvial/aeolian deposits**

- Classroom introduction to styles of faulting and impact on fluid flow in the subsurface
- Field: Outcrops at Clashaic Cove
- Field: Outcrops at Cumingston
- Classroom: Virtual Outcrops from Utah
  - Looking at faults, including the Moab Fault and Bartlett Fault
  - Collapse structures on the Salt Valley Anticline
- Transfer to Aberdeen for departure