

# Hatfield-2501: Characterization of surface/near-surface structural geological properties for infrastructure planning

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## Challenge

|                                                                                                                                                                                                                                                                                |                                                                                                        |                                                                              |                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------|
| Challenge ID:                                                                                                                                                                                                                                                                  | HCP-2501                                                                                               | Originator:                                                                  | Onshore: Hatfield |
| Title:                                                                                                                                                                                                                                                                         | Characterization of surface/near-surface structural geological properties for infrastructure planning. |                                                                              |                   |
| Theme:                                                                                                                                                                                                                                                                         | ON 2.5: Surface Geology Mapping - Engineering geological evaluation                                    |                                                                              |                   |
| Consortium Lead:                                                                                                                                                                                                                                                               | Arup                                                                                                   | Interviewed Company:                                                         | Arup              |
| Geography:                                                                                                                                                                                                                                                                     | ON.REG.00 - Generic onshore                                                                            |                                                                              |                   |
| Challenge Description                                                                                                                                                                                                                                                          |                                                                                                        |                                                                              |                   |
| What is not possible / not adequately addressed at present?                                                                                                                                                                                                                    |                                                                                                        |                                                                              |                   |
| Need to support the identification of engineering-geological parameters of surface and near-surface materials (rock-soil) for design of infrastructure, foundation design, route planning and slope stability assessment, and rock excavability (e.g. for pipeline trenching). |                                                                                                        |                                                                              |                   |
| What effect does this challenge have on operations?                                                                                                                                                                                                                            |                                                                                                        |                                                                              |                   |
| Reduces uncertainty, improves decision making for field development.<br>Early identification of constraints and opportunities.                                                                                                                                                 |                                                                                                        |                                                                              |                   |
| Thematic information requirements:                                                                                                                                                                                                                                             |                                                                                                        | Identification of: soil / rock; soil type (sand / clay); soft / hard ground; |                   |
| What do you currently do to address this challenge?                                                                                                                                                                                                                            |                                                                                                        |                                                                              |                   |
| How is this challenge conventionally addressed?                                                                                                                                                                                                                                |                                                                                                        |                                                                              |                   |
| Geotechnical Desk Study<br>Ground investigations and boreholes<br>Geological maps<br>Field geological mapping<br>Geophysics<br>Remote Sensing (multispectral) analysis                                                                                                         |                                                                                                        |                                                                              |                   |
| What kind of solutions do you envisage could address this challenge?                                                                                                                                                                                                           |                                                                                                        |                                                                              |                   |
| DEM analysis<br>High Resolution stereo DEM<br>Multispectral and hyperspectral<br>Automated classification processing<br>Geophysics                                                                                                                                             |                                                                                                        |                                                                              |                   |
| What is your view on the capability of technology to meet this need?                                                                                                                                                                                                           |                                                                                                        |                                                                              |                   |
| Are you currently using EO tech? If not, why not?                                                                                                                                                                                                                              |                                                                                                        |                                                                              |                   |
| Best suited to use of high resolution optical imagery and high resolution DEM. Currently only rarely used because of perceived high cost. There is a need to educate industry to the cost-benefit value of using this data early on in project lifecycle - data                |                                                                                                        |                                                                              |                   |
| Challenge Classification                                                                                                                                                                                                                                                       |                                                                                                        |                                                                              |                   |
| Impact on Lifecycle (0=none, 4=high):                                                                                                                                                                                                                                          |                                                                                                        | Climate / Topography / Urgency:                                              |                   |
| Pre-license:                                                                                                                                                                                                                                                                   | 1                                                                                                      | Climate class:                                                               | Generic climate   |

|                                           |                                                                                              |                      |                                                  |
|-------------------------------------------|----------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------|
| Exploration:                              | 2                                                                                            | Topographic class:   | Not specific                                     |
| Development:                              | 3                                                                                            | Seasonal variations: | Any season                                       |
| Production:                               | 1                                                                                            | Impact area:         | Environmental, Health and Safety, Cost reduction |
| Decommissioning:                          | 1                                                                                            | Technology urgency:  | 3 - Immediately (0-2 years)                      |
| <b>Challenge Information Requirements</b> |                                                                                              |                      |                                                  |
| Update frequency:                         | Snapshot                                                                                     |                      |                                                  |
| Data currently used:                      | Air photo interpretation<br>DEM analysis (ASTER, SRTM, High res optical DEM)<br>Google Earth |                      |                                                  |
| Spatial resolution:                       | Regional to License                                                                          |                      |                                                  |
| Thematic accuracy:                        | Not specific                                                                                 |                      |                                                  |
| Required formats:                         | Not Specific                                                                                 |                      |                                                  |
| Timeliness (Vintage):                     | Reference data                                                                               |                      |                                                  |
| Geographic extents:                       | License                                                                                      |                      |                                                  |
| Existing standards:                       | None                                                                                         |                      |                                                  |

## Relevant products

### Content by label

There is no content with the specified labels