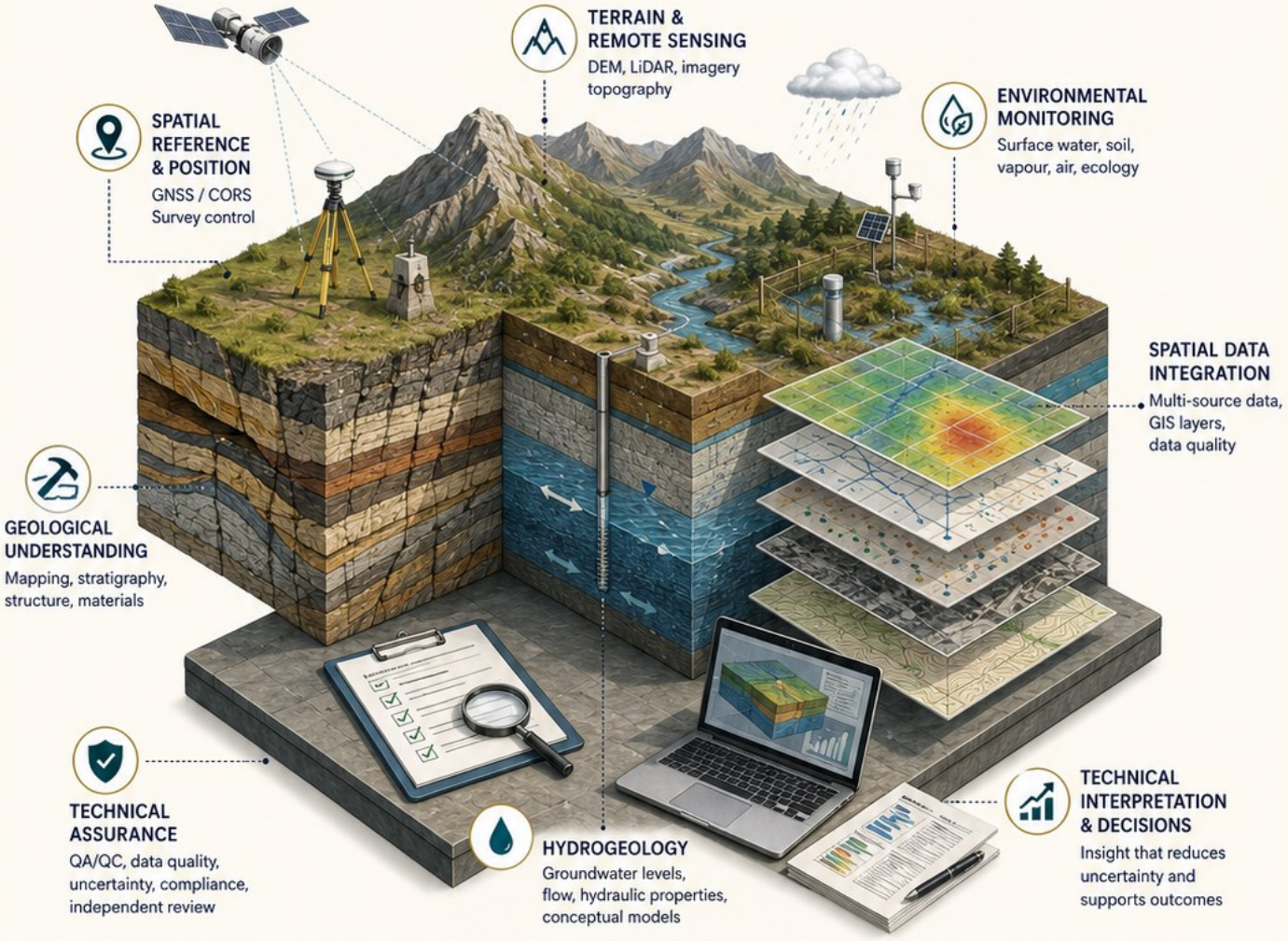
Dr Andrew Gray

Integrated Geoscience and Spatial-Data Capability Portfolio

Geoscience | Geomatics | Hydrogeology | Environmental Risk | Spatial Data | Technical Assurance



> “The first benefit of investigation is not increased confidence, but removal of false confidence.”

Prepared as a concise visual supplement to a CV. This portfolio summarises how Dr Andrew Gray applies integrated geoscience, survey control, groundwater, environmental and spatial-data judgement to reduce technical uncertainty and support project decisions.

Integrated technical judgement where ground, water, position, data quality and uncertainty materially affect project risk, design confidence and employer value.

Professional Profile

Integrated technical judgement across geology, groundwater, geomatics and environmental data.

I combine geoscience expertise with spatial-data capability and technical assurance to interpret complex subsurface and environmental systems with clarity and confidence. My work integrates field observations, analytical data and spatial datasets to build coherent, defensible models that address questions, reduce uncertainty and support better decisions.

With experience across groundwater, contaminated land, geomatics and subsurface geoscience, I provide independent judgement from early investigation through to remediation and close-out. I am known for rigorous QA/QC, transparent communication and a practical focus on outcomes that protect value, mitigate risk and meet regulatory expectations.

CAPABILITY OVERVIEW

1 

Geomatics and survey control

Coordinate, datum, positional QA/QC and monitoring frameworks.

2 

Hydrogeology

Aquifer conceptualisation, recharge, groundwater flow and water-quality interpretation.

3 

Environmental / contaminated land

Source-pathway-receptor models, plume interpretation and remediation planning.

4 

GIS and remote sensing

Spatial synthesis, data integration, mapping and stakeholder communication.

5 

Petroleum / subsurface geoscience

Field appraisal, reservoir uncertainty and legacy data interpretation.

6 

Technical assurance

Method review, contractor oversight, QA/QC and defensible reporting.

CORE CONTRIBUTION

Reduces false confidence
Identifies data gaps and uncertainty so decisions reflect true risk.

Builds defensible models
Integrates data and understanding into coherent, transparent models.

Improves decisions
Provides clear, evidence-based insight to support outcomes and optimise value.

> Integrated capability applied to reduce uncertainty, improve technical defensibility and support employer decision-making.

DR ANDREW GRAY

How Dr Andrew Gray Works

A practical sequence for reducing uncertainty and improving technical decisions

1. Define the project question.
2. Review data and uncertainty.
3. Establish spatial and technical control.
4. Integrate multiple evidence streams.
5. Develop a defensible conceptual model.
6. Identify critical data gaps.
7. Communicate decision-ready conclusions.

Data review

Checks completeness, lineage, attribution, coordinate systems, sampling purpose, precision and relevance.

Conceptual model

Uses geological, geomorphological, hydrological and environmental reasoning to explain site controls.

Decision support

Separates what is known, what is assumed, and what must be investigated before major decisions are made.

> The aim is not simply to produce maps.
> The aim is to produce usable technical intelligence that improves investigation, design and risk decisions.

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Geo-spatial Data and Uncertainty

Location-based data becomes valuable when it is controlled, attributed and interpreted correctly.

Geo-spatial data is data tied to location. When it is attributed, organised and interrogated, it becomes information that helps visualise complex 3D and temporal situations.

1. **OBSERVED** — Data captured in the field
2. **PRESERVED** — Stored securely with metadata and provenance
3. **PROCESSED** — Validated, cleaned and structured
4. **ANALYSED** — Interrogated to extract patterns and relationships
5. **COMMUNICATED** — Communicated clearly to inform action

Reliability depends on

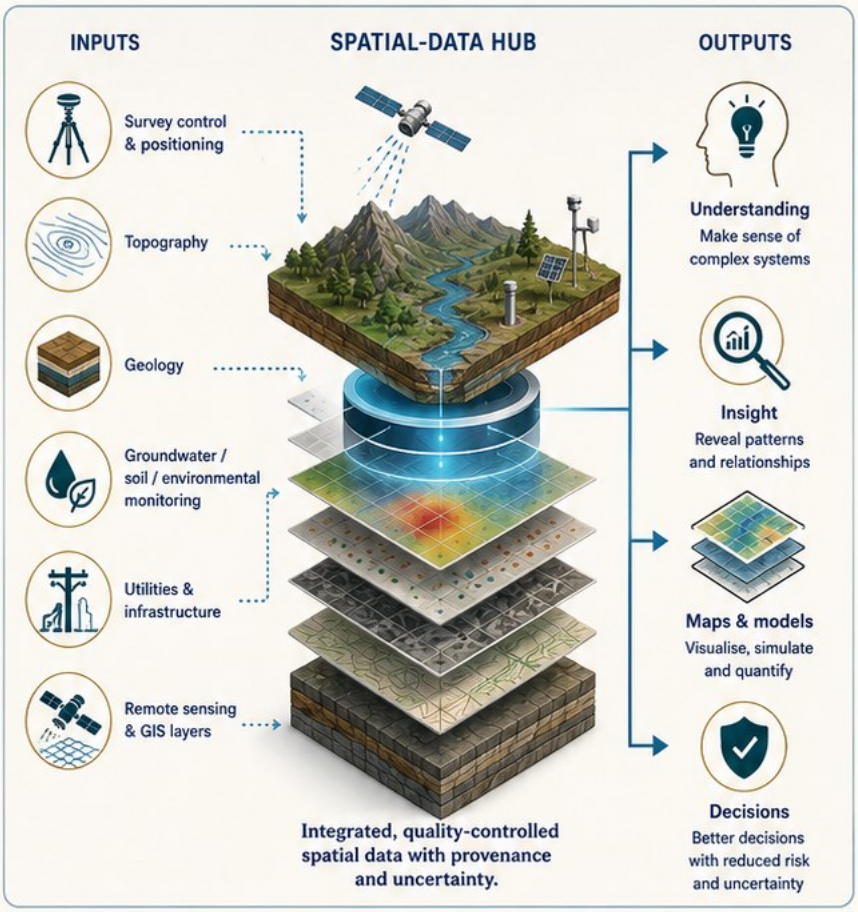
Quality of sampling
Representative, sufficient and fit for purpose.

Quality of position
Accurate, precise and in the correct coordinate reference system.

Quality of attribution
Clear, consistent metadata and defined units.

Relevance of the data
Appropriate to the question and decision context.

Correct positioning in the correct coordinate reference system is imperative.



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Applied Experience: Spatial, Survey and Infrastructure Data

Reducing practical project risk through records, detection, verification and spatial control.

UTILITY RECORD REVIEW AND UNCERTAINTY SCREENING

Identify data gaps, inconsistencies and positional uncertainty.

SURFACE DETECTION UNDERSTANDING USING EML AND GPR

Detect and map subsurface features and anomalies.

GEOSPATIAL CONTROL AND SURVEY INTEGRATION

Accurate positioning of assets and survey observations.

VERIFICATION, CONFLICT RESOLUTION AND DIGITAL ATTRIBUTION

Reconcile records, resolve conflicts and attribute with confidence.

GIS / CAD DATA CAPTURE FOR DESIGN AND EXCAVATION PLANNING

Deliver structured data for safe design, analysis and construction.

TYPICAL UTILITY AND INFRASTRUCTURE DATA THEMES

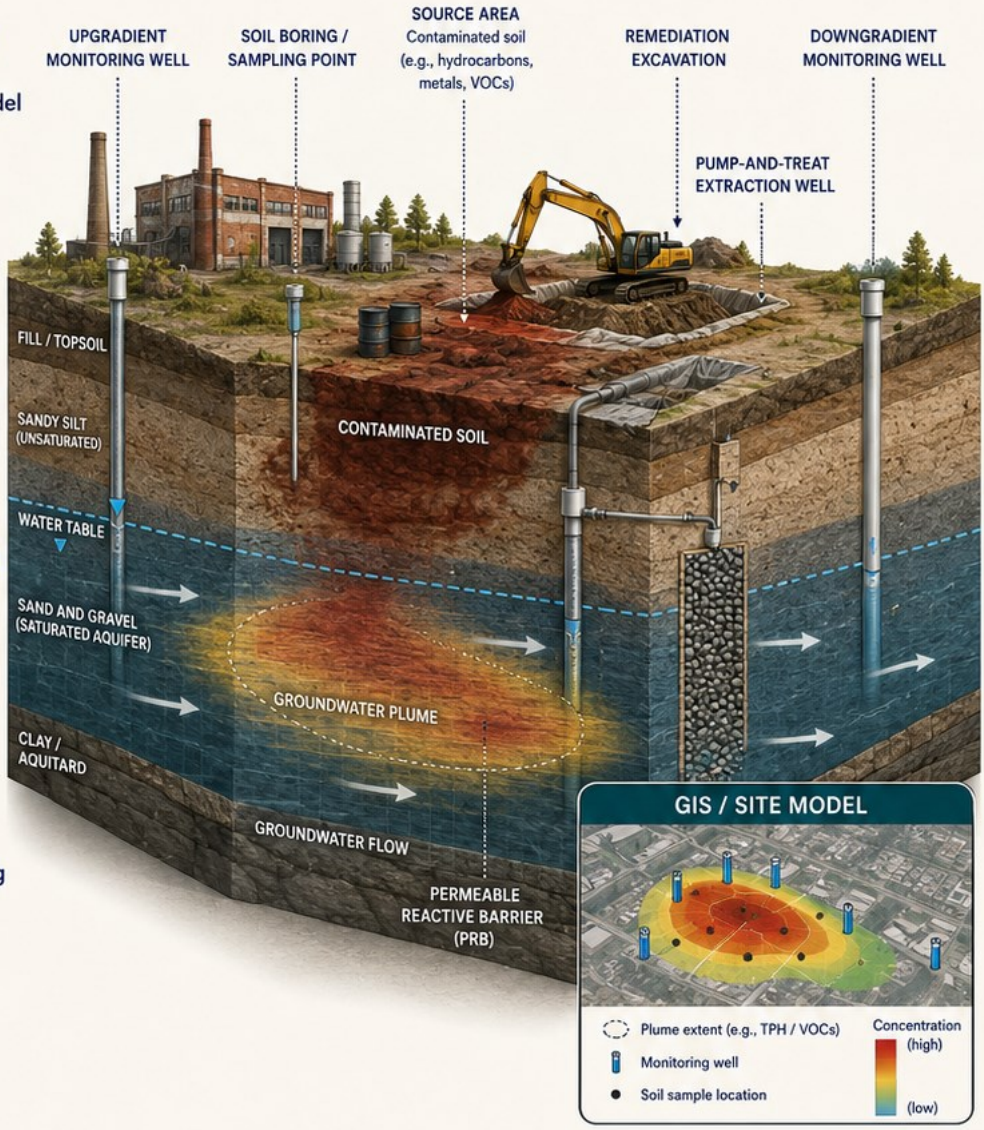
WATER | SEWER | TELECOM | ELECTRIC | GAS | GIS / CAD MODEL

> Buried asset uncertainty is converted into structured spatial understanding that reduces design conflict, excavation risk and rework.

Applied Experience: Contaminated Land and Remediation

Integrating soil, groundwater and environmental data into defensible spatial risk models

- Contaminated land desk study and conceptual site model
- Soil and groundwater sampling strategy
- Source-area and contaminant-plume delineation
- Aquifer characterisation and monitoring wells
- Source-pathway-receptor assessment
- Risk-based remediation planning and validation monitoring
- Environmental data integration into GIS / CAD



> Contaminated soil and groundwater uncertainty is converted into a defensible spatial risk model that supports investigation, remediation, monitoring and regulatory decision-making.

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Applied Experience: Site Characterisation and Water Projects

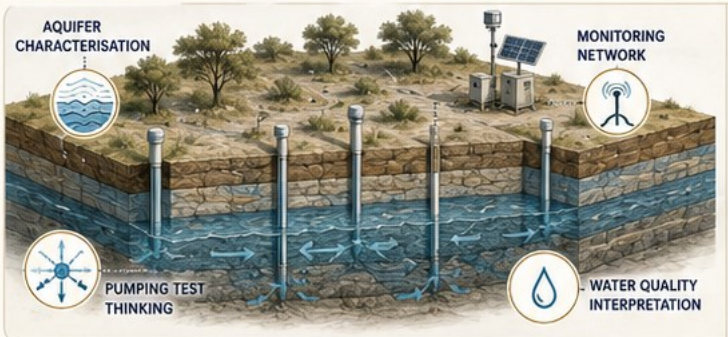
Integrating ground, water, terrain and environmental constraints for practical development decisions.

1. Al-Teeb development

- Arid-region water security
- Flooding
- Managed aquifer recharge
- Reservoir constraints
- Groundwater quality
- GIS-based catchment interpretation

2. Kuwait Bay / Doha Port

- Shallow coastal site characterisation
- Bathymetry
- Tidal datum control
- Nearshore ground investigation planning
- Dredging and reclamation constraints



3. Groundwater and monitoring

- Aquifer characterisation
- Pumping-test thinking
- Water-quality interpretation
- Monitoring design
- Spatial analysis of environmental data

TRANSFERABLE APPROACH

1. DEFINE THE DECISION
Clarify objectives, constraints and success criteria.

2. TEST THE DATA
Evaluate quality, coverage and fitness for purpose.

3. UNDERSTAND SPATIAL UNCERTAINTY
Map variability, data gaps and confidence.

4. BUILD THE CONCEPTUAL MODEL
Integrate ground, water, terrain and environment.

5. TARGET THE NEXT INVESTIGATION STEP
Focus effort on the governing risk to reduce uncertainty.

> Water, ground and environmental data are integrated into defensible technical models that support design options, mitigation planning and stakeholder communication.

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Employer Value and Role Fit

How this capability supports technical teams, project managers and decision-makers

Dr Andrew Gray is well suited to roles where technical uncertainty must be identified, structured and communicated clearly to support sound decisions. His strongest value sits at the interface between field data, spatial data, geological interpretation, hydrogeological reasoning, environmental risk and project decision-making.

This capability is directly relevant to technical assurance, multidisciplinary integration, defensible reporting, investigation planning, contractor review and mentoring. It helps organisations reduce uncertainty, target resources effectively and deliver decisions that are robust, efficient and explainable.

Employer need	Contribution
Better technical assurance	Independent review of assumptions, methods, data quality and interpretation risk.
Improved investigation design	Focus effort on the data gaps that control decisions and uncertainty.
Stronger spatial reliability	Check position, level, datum, attribution and coordinate-system consistency.
Clear stakeholder communication	Convert complex ground, water and spatial evidence into decision-ready outputs.
Team capability building	Mentoring, technical explanation and practical quality-control guidance.

> Integrated geoscience and spatial-data judgement for projects where location, ground conditions, water, contamination and uncertainty matter.