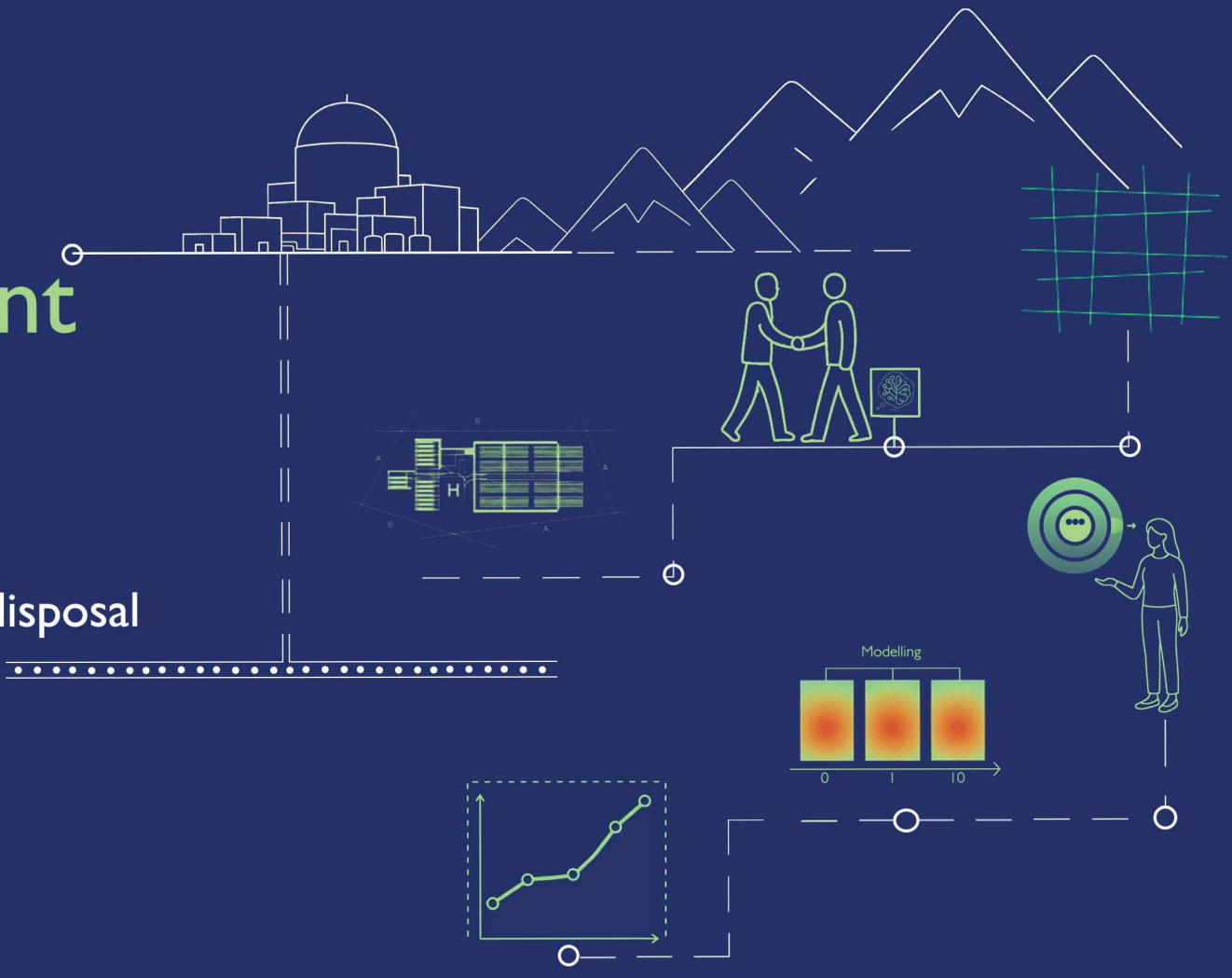
Digital Ecosystem
Capability Statement

Scientific excellence -
Engineering confidence in geological disposal



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The Digital Ecosystem

MCM's digital ecosystem represents an integrated suite of capabilities that connect data, models, safety arguments, and decision-making across the entire life cycle of radioactive waste management.

Geological disposal programmes generate vast amounts of data - from site characterisation measurements to laboratory experiments, numerical simulations, and operational monitoring. Processing this data, and making use of the resulting information requires not just sophisticated tools but a systematic approach to data management, model integration, and knowledge synthesis. Our digital ecosystem provides the framework for this integration.

1

Data-driven safety case architecture

Quality-assured data systems built to ensure traceability and reproducibility. Integrated data ecosystems support consistent modelling, safety analysis, and programme-wide knowledge management.

2

Multi-scale simulations and design

Model-based system engineering to connect detailed scientific models to larger engineering models so that simulation results directly inform the disposal facility design. The result is a modular, well-tested design that can be more easily extended by AI and other new technologies.

3

Traceable decision frameworks

Claims, arguments and evidence structures connect technical outputs to safety requirements, supporting transparent, risk-informed decisions and regulatory confidence at every stage of implementation.

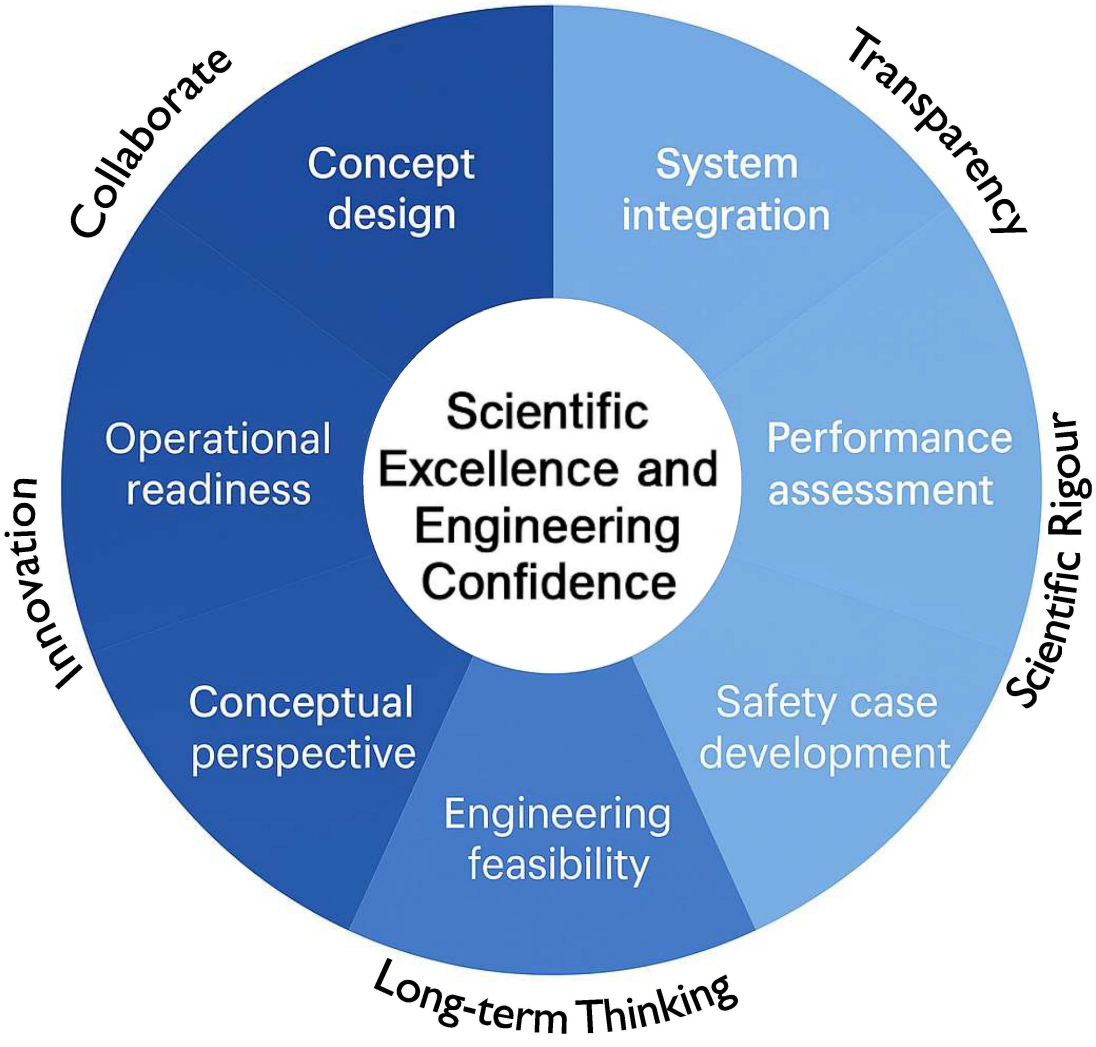
From Digital Ecosystem to Repository Digital Twin

MCM's digital ecosystem lays the foundation for building a disposal facility digital twin - a dynamic, data-integrated representation of how a deep geological repository is likely to evolve in the very long-term. This digital twin connects conceptual, numerical, and safety models with real-world data, enabling continuous validation of long-term performance.

By simulating coupled processes such as heat transfer, chemical degradation, and mechanical stability, the digital twin helps demonstrate safety over geological time scales. It supports transparent decision-making, regulatory confidence, and stakeholder engagement by making complex science intelligible and traceable.

Advances in AI, high-performance computing, and digitalisation of safety cases now allow us to integrate diverse datasets, models, and safety arguments into a coherent, adaptive framework. This unlocks new possibilities for scenario analysis, uncertainty management, and life cycle optimisation.

Through our digital ecosystem we aim to deliver scientific excellence and engineering confidence, enabling clients to plan, design and deliver safe and feasible disposal solutions.



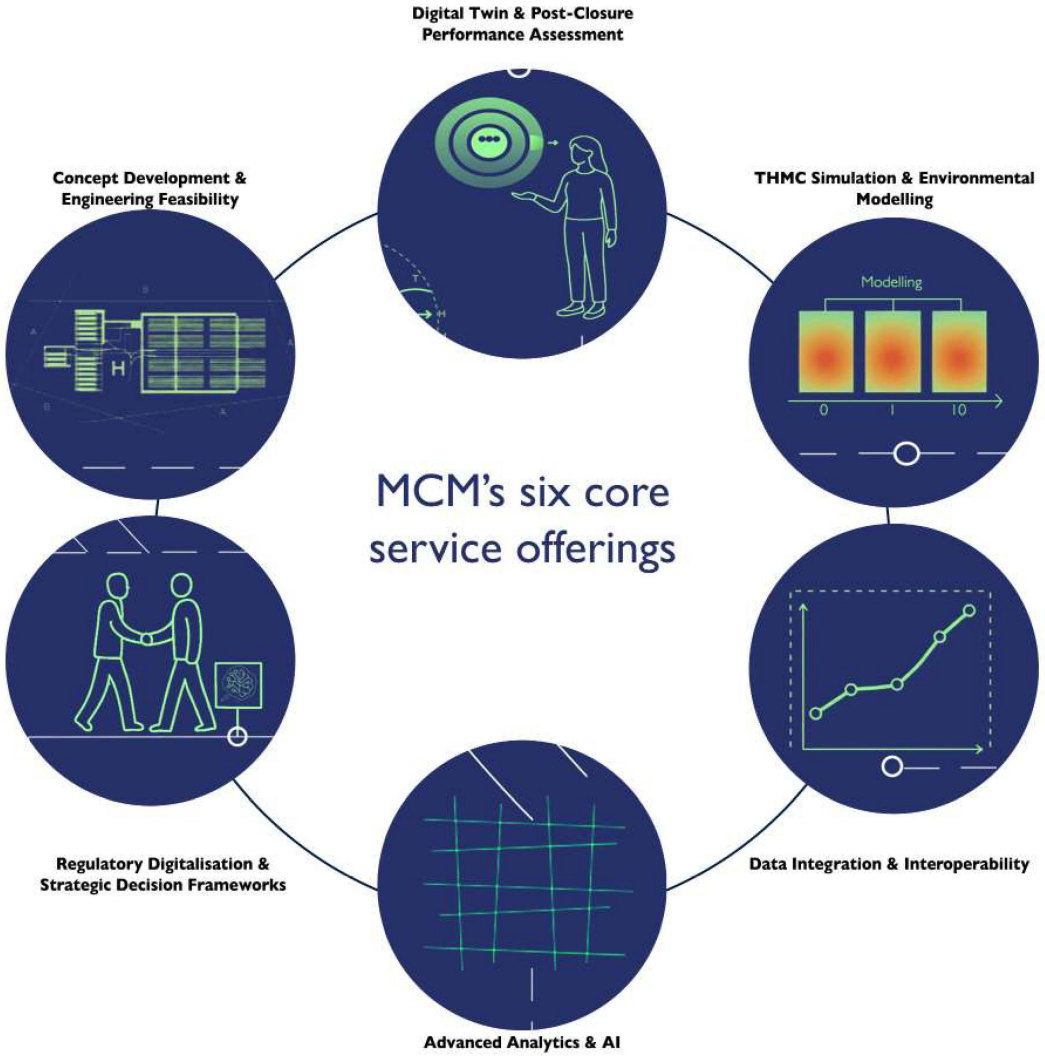
The MCM approach

We go beyond technical delivery to help shape a sustainable legacy for radioactive waste management. One grounded in transparency, safety, and public trust.

We approach geological disposal as a systems challenge, where long-term safety depends on the integrated behaviour of engineered and natural barriers, digital models, and regulatory frameworks. Our digital ecosystem connects data, models, and structured reasoning across disciplines - from nanoscale material degradation to facility-scale evolution over geological time-scales.

We combine frontier science with pragmatic engineering to support Clients in developing robust, defensible safety cases. Our work spans concept development, performance assessment, licensing support, and operational readiness, always with a focus on lifecycle adaptability and stakeholder confidence.

Through strategic partnerships, deep technical expertise, and a commitment to innovation, MCM helps clients build future-ready disposal systems using our six core service offerings.



Our six service offerings

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Our six service offerings:

01 | Digital Twin & Post-Closure Performance Assessment



Overview

The MCM Approach

MCM provides specialist expertise in the long-term safety and performance of near-surface and deep geological disposal facilities. We recognise that every facility is unique and, when sited and built correctly, can safely isolate radioactive materials in the very long term. To demonstrate this post-closure passive safety, we combine technical knowledge, laboratory and field data, and models of components and systems into a single integrated framework that acts as a disposal facility digital twin. This framework links design, regulatory requirements and structured safety arguments so decisions are traceable and evidence-based.

Our post-closure performance assessments produce a robust, auditable evidence base that demonstrates compliance with requirements and supports confidence in the long-term safety of a disposal facility.

The MCM Offering

Our strength lies in multi-discipline integration using a systems thinking approach that brings together geology, engineering, safety, and environmental science into a coherent and traceable framework. We develop and manage the disposal system definition and baseline technical configuration to ensure that performance assessments are not only scientifically sound but also consistent with regulatory expectations.

We favour the application of requirements management using industry good practice to ensure that safety, technical, and regulatory needs are captured, allocated, and verified consistently across all disciplines and throughout the lifecycle of the disposal system. We embed structured reasoning approaches by applying knowledge base codification using Claims, Arguments and Evidence (CAE), ensuring that safety claims are underpinned by traceable arguments and verifiable evidence.

We address uncertainty by employing risk and uncertainty management using ALARP, ALARA and BAT principles, ensuring that decisions about safety, design, and operational strategies are balanced, optimised, and fully justified.

How we can help

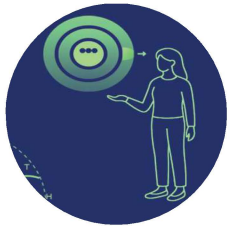
- Post-closure performance assessment
- Systems engineering integration
- Requirements management (INCOSE)
- Safety case development (CAE frameworks)
- Risk and uncertainty management
- Disposal system baseline configuration
- Regulatory framework interpretation
- Scenario development and analysis
- Visualisation and digital twins

Additional related expertise

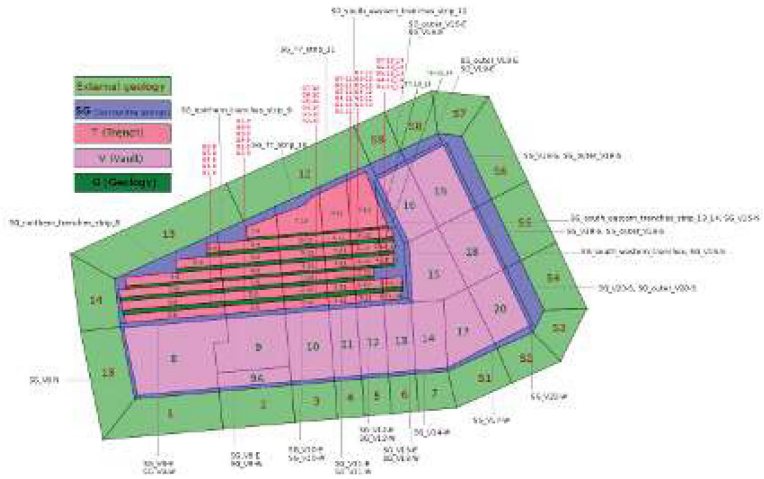
- Data and model management
- Independent review and assurance
- Stakeholder engagement support
- Training and knowledge transfer

Our six service offerings:

01 | Digital Twin & Post-Closure Performance Assessment



Project Overview



Developing complex digital models to support the LLWR Safety Case

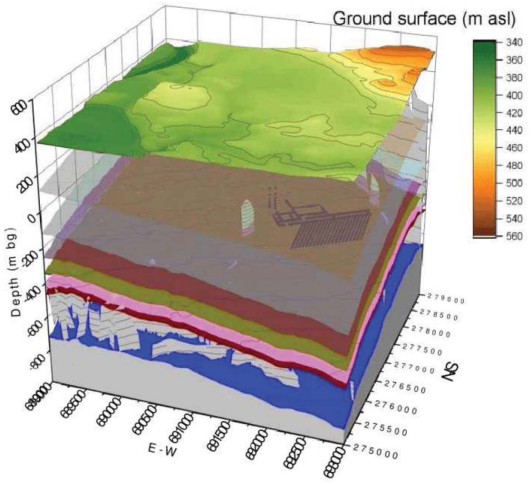
We supported Nuclear Waste Services (UK) in developing the Environmental Safety Case (ESC) for the Low-Level Waste Repository, due in 2026, by modelling time-dependent potential doses and risks to humans. We use specialist software to develop our high-dimensional stochastic models and employ bespoke visualisation and automated workflows to ensure that safety arguments are communicated appropriately.
A key part of the ESC is the understanding of biases and uncertainties; we have developed a structured audit process involving an identification, screening, and sentencing methodology to distinguish managed or low-impact issues from those needing further analysis which is now used for all modelling undertaken throughout the ESC.



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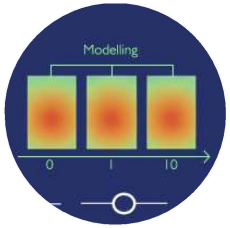


Integrating geoscience and digital modelling to guide the UK GDF Site Evaluation

MCM has been involved with three separate studies for NWS to outline compatible disposal system concepts for each of its Site Evaluation Areas of Focus, creating the foundation for safety, security, safeguards, environmental and sustainability assessments. Acting as integrators, we brought together information from geoscience and developed conceptual models of groundwater flow and geochemistry, geomechanical properties and in-situ temperature and thermal properties using our range of digital toolkits to establish a technical baseline of how a facility could be designed and evolve over time. By identifying high-level safety considerations and knowledge gaps, we provided NWS with a clear framework for prioritising future work and progressing confidently towards detailed site evaluation.

Our six service offerings:

02 | THMC Simulation & Environmental Modelling



Overview

The MCM Approach

MCM Environmental Services offers advanced expertise in Thermal-Hydro-Mechanical-Chemical (THMC) modelling to support the design, optimisation, and long-term performance assessment of GDF. We recognise that understanding the coupled processes governing disposal facility evolution, from the thermal pulse of heat-generating waste to the mechanical stability of tunnels and the chemical degradation of barrier materials, is essential for building confidence in disposal facility safety.

Our approach combines process-based physics, validated numerical simulations, and multi-scale modelling frameworks that address the long-term time evolution of the geosphere and engineered barrier system.

The MCM Offering

We develop and apply bespoke modelling toolkits capable of simulating a wide range of materials and waste forms, including container materials (copper, steel, coated systems, ductile cast iron), backfill and buffer systems (clays, bentonite, cement-based materials), and diverse waste streams spent fuel, depleted uranium, plutonium). Our toolkits can be applied; from a multi-square-km facility, through individual disposal areas for different types of waste.

Our modelling services place particular emphasis on thermal dimensioning, voidage and resaturation dynamics, and the mechanical behaviour of barrier systems under coupled loads. We address chemical interactions including corrosion, cement degradation, radionuclide release, and multi-phase transport, aligned with latest research from peer-reviewed scientific literature and international knowledge bases.

By applying high-performance computing (HPC) resources and access to supercomputers at the Harwell Campus (STFC), we conduct computationally demanding simulations, inverse modelling, and sensitivity analyses. We see high-fidelity THMC modelling as a platform for knowledge integration, making complex repository processes intelligible to diverse stakeholders through advanced visualisation techniques.

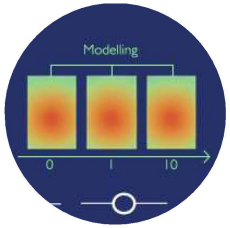
How we can help

- Thermal dimensioning and modelling
- Hydro-mechanical coupled modelling
- Chemical interaction modelling
- Multi-scale simulation frameworks
- Reactive transport modelling
- Waste form-specific modelling
- Material behaviour toolkits
- HPC-enabled simulations
- Uncertainty and sensitivity analysis

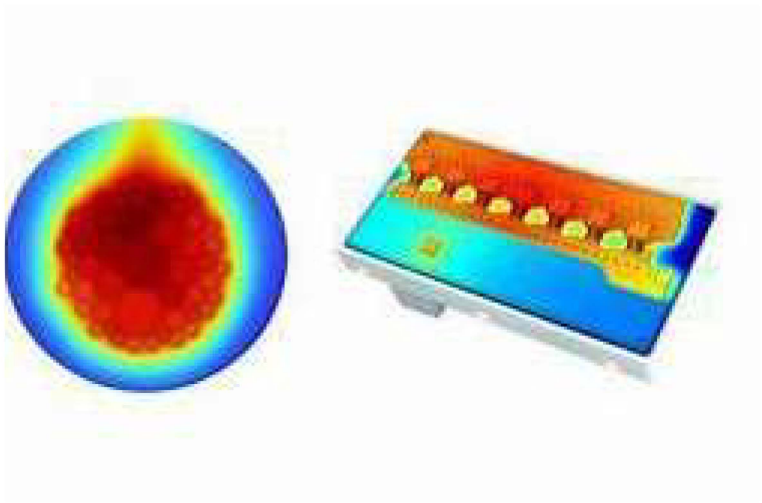
Additional related expertise

- Voidage and gas evolution modelling
- 3D/4D visualisation of coupled processes
- Digital twin integration
- Model benchmarking

02 | THMC Simulation & Environmental Modelling



Project Overview



Thermal Dimensioning to explore the design space and footprint of the UK GDF, UK

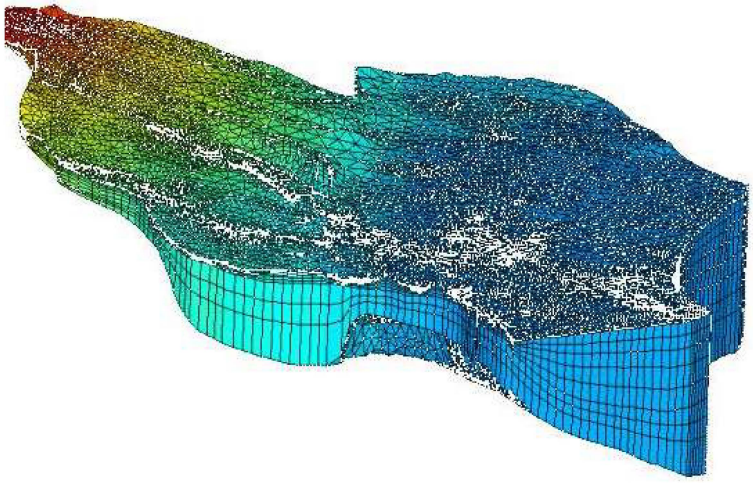
MCM Environmental Services applied its thermal–hydro–mechanical–chemical (THMC) modelling expertise to support repository design through advanced thermal dimensioning studies. Using high-fidelity numerical simulations, we explored the evolution of coupled processes in engineered barriers and host rocks, addressing heat transfer, groundwater flow, geomechanical stability, and geochemical reactions. Our digital toolkits modelled material behaviours across scales, from facility layouts to individual waste packages, including copper, steel, clay, and cement-based barriers. This work provided clients with a robust digital baseline for assessing long-term performance, enabling safe design optimisation and evidence-based decision-making for the UK Geological Disposal Facility



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Digitally integrated models for groundwater flow in fractured rock, Sweden

Our team has led the development of hydrogeological models for fractured crystalline rock to support nuclear waste disposal safety assessments. Using applied geo-statistical analysis and stochastic Discrete Fracture Network (DFN) modelling, we calibrated to hydraulic tests, and upscaled to estimate bulk flow properties. Work included large-scale hydraulic test simulations, palaeo-chemical modelling over glacial cycles, and thermo-hydro-mechanical analysis of heat-generating waste impacts on fracture permeability. At Forsmark and Laxemar, our team authored key reports for SKB detailing DFN methodology and uncertainty treatment. These models provided critical input to Performance Assessment programmes and advanced understanding of groundwater flow and geochemical evolution in fractured rock.

Our six service offerings:

03 | Data Integration & Interoperability



Overview

The MCM Approach

MCM understands that the future of disposal facility modelling lies not only in advanced simulations but also in the ability to link modelling tools across disciplines. GDF safety cases require consistent handling of data across different scales, disciplines, and modelling paradigms.

Our approach to data integration and interoperability builds on our strengths in post-closure performance assessment and THMC process modelling, extending these into data elicitation, backend database management, and model interoperability frameworks.

The MCM Offering

We provide skills in structuring, curating, and codifying data from diverse sources including geological, geochemical, mechanical, and performance assessment studies. This includes experience in Claims-Arguments-Evidence frameworks, structured knowledge bases, and technical baselines, all of which rely on robust data integration. We ensure traceability, reproducibility, and interoperability across modelling work flows.

Our expertise includes backend data management—establishing data architectures, controlled vocabularies, metadata standards, and FAIR principles (Findable, Accessible, Interoperable, Reusable). We support the creation of consistent, quality-assured data environments that enable models to be linked and compared.

By applying skills in uncertainty quantification, parameter management, and sensitivity analysis, we ensure that modelling outputs are meaningful for decision-making.

How we can help

- Data elicitation and structuring
- Backend database management
- Metadata standards and FAIR principles
- Knowledge codification (CAE frameworks)
- Requirements traceability
- Cross-tool interoperability
- Benchmarking and model comparison
- Uncertainty data management
- Data visualisation and reporting

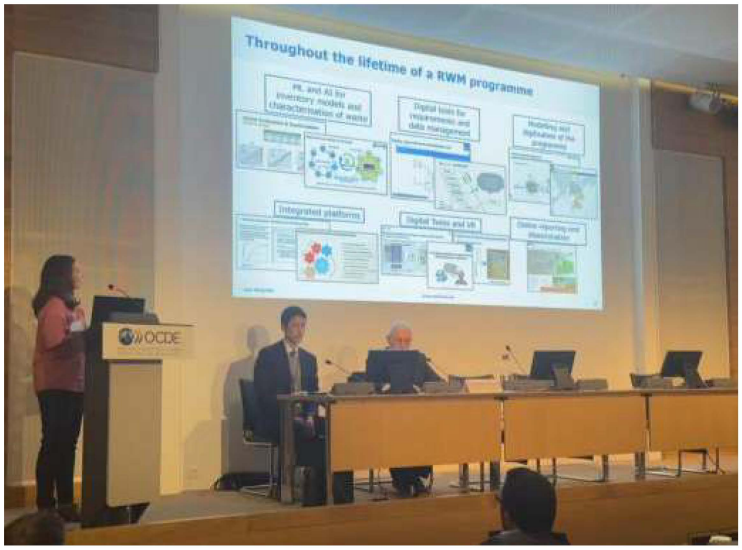
Additional related expertise

- Collaborative platform readiness
- Sensitivity and parameter tracking
- Digital twin data integration
- Model hub contributions

Our six service offerings:

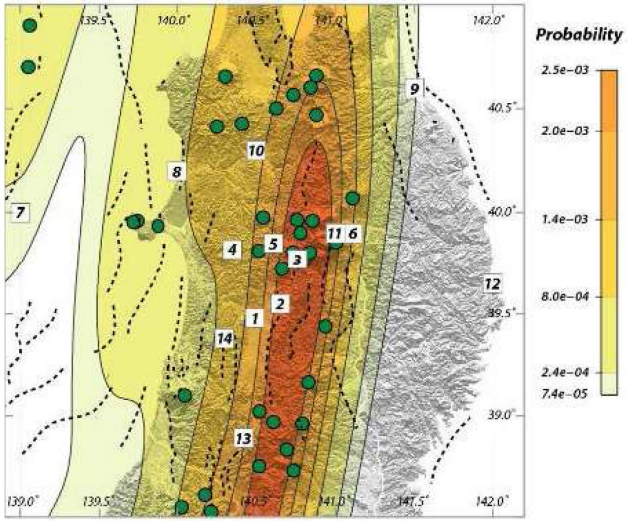
03 | Data Integration & Interoperability

Project Overview



Digital technologies for an e - safety case

MCM supports the OECD Nuclear Energy Agency in advancing digital safety case integration for radioactive waste and geological disposal. Through strategic collaboration and technical insight, we're helping shape the adoption of augmented engineering - where data, AI, simulation, and systems thinking converge to strengthen long-term decision-making. We currently hold a sole source framework for consultancy support to the NEA on data and information management for services relative to application of digital technologies to a safety case. Our contribution reflects a commitment to intelligent industry transformation, enabling traceable design intent, virtual verification, and real-time risk assessment. Positioned at the heart of knowledge exchange, MCM is driving innovation across the nuclear sector, bridging regulators, technologists, and operators in a shared vision for safer, smarter data and knowledge management.



Data Elicitation

MCM has supported UK and Japanese clients in complex data elicitation for safety-critical programmes, including the TOPAZ project in Japan. We specialise in integrating expert judgement, site-specific data, and uncertainty quantification to strengthen digital safety cases. Our approach blends deterministic and probabilistic techniques, using sensitivity analysis to explore how assumptions and data gaps influence confidence levels. By embedding structured elicitation frameworks and adaptive modeling, we help clients move beyond static assessments toward transparent, evidence-based decision-making.

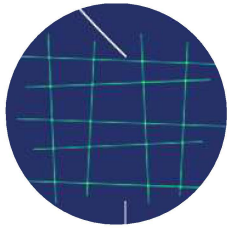
Image : Volcanic Hazard Mapping from TOPAZ, Japan



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Our six service offerings:

04 | Advanced Analytics & AI



Overview

The MCM Approach

MCM has long been recognised for its expertise in uncertainty management in safety case development. Building on this foundation, we are expanding into advanced analytics and artificial intelligence to support the next generation of disposal facility performance assessments.

We see significant potential in predictive modelling, surrogate models, and large language models (LLMs) to transform how complex geological disposal data is analysed, communicated, and integrated into structured safety arguments.

The MCM Offering

Our capabilities are aimed at making emerging tools accessible and usable for clients. This includes deploying LLMs to support document analysis, data elicitation, and knowledge extraction, enhancing the efficiency of producing technical assessments and Claims–Arguments–Evidence structures. We apply predictive modelling and surrogate models to accelerate computationally intensive simulations, enabling sensitivity analyses and scenario evaluations previously impractical due to scale or cost.

We invest carefully in skills and toolkits that offer real value, including internal R&D in uncertainty-aware surrogate models, integration of machine learning accelerators into THMC toolkits, and exploration of AI-driven interoperability solutions. We ensure that new techniques are used responsibly, transparently, and in line with regulatory expectations.

Advanced analytics and AI bring opportunities to improve communication and engagement. MCM actively develops visualisation, interactive dashboards, and natural language interfaces to make complex model outputs more accessible to regulators, decision-makers, and stakeholders, positioning clients at the forefront of efficiency and innovation.

How we can help

- Uncertainty quantification (AI-enabled)
- Predictive modelling
- Surrogate model development
- LLM-enabled knowledge extraction
- AI-assisted safety case support
- HPC and AI integration
- AI-enhanced scenario exploration
- Global sensitivity analysis
- Interactive dashboards

Additional related expertise

- Data interoperability via AI
- Responsible AI adoption frameworks
- Talent development in AI
- Natural language interfaces

04 | Advanced Analytics & AI

Project Overview

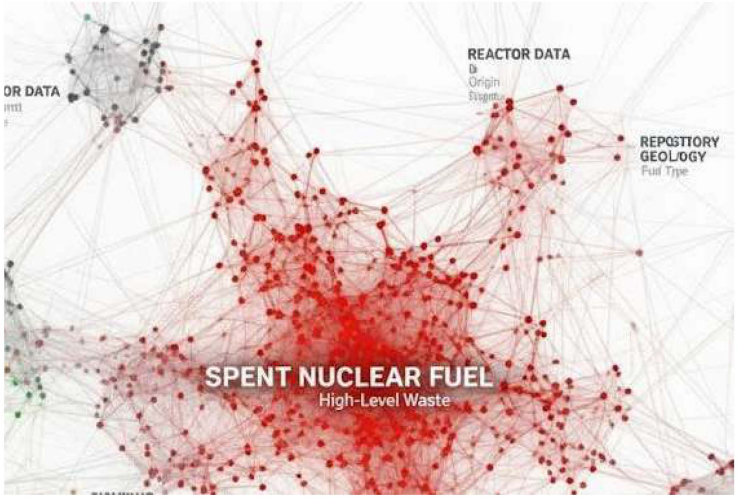


Surrogate Model for Groundwater Modelling

To accelerate disposal facility-scale hydrogeological assessments, MCM developed a surrogate model to replicate the behaviour of high-fidelity groundwater flow simulations. By training the surrogate against thousands of discrete fracture network runs, we enabled rapid sensitivity analyses and scenario testing that would have been computationally prohibitive using full models. This approach delivered faster insights into uncertainty and supported more efficient decision-making for site evaluation.



Robin Shannon
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LLM for GDF Knowledge Base Structuring

MCM applied large language models to codify and structure technical knowledge for geological disposal safety cases. By creating insight documents with controlled vocabularies, metadata standards, and relationship mapping, we enabled better surfacing of knowledge and transparent linkage of claims, arguments, and evidence. Integrated into a requirements management system, this approach established a structured disposal system definition, improving traceability, accessibility, and confidence for both Implementers and Regulators.

Our six service offerings:

05 | Roadmaps, Options Analysis & Strategic Decision Frameworks



Overview

The MCM Approach

MCM supports regulators, implementers, nuclear power plant operators, and governments in navigating the complex landscape of radioactive waste management decision-making. We combine technical expertise in performance assessment and modelling with broader capabilities in regulatory digitalisation, decision frameworks, and lifecycle planning.

Our approach enables organisations to make transparent, evidence-based, and future-proof decisions across the nuclear lifecycle - from early concept space optioneering through to implementation, closure and beyond.

The MCM Offering

We work with clients to design and implement structured decision frameworks that integrate cost, safety, environmental, and social dimensions. This includes preparing position papers and business cases for government, through to pan-European consultation exercises to ensure decisions are well-grounded, broadly supported, and consistent with regulatory expectations. Our experience in Claims–Arguments–Evidence frameworks, combined with digital regulatory tools, allows us to support both implementers in preparing cases, and regulators in digitising and interrogating them.

MCM provides assurance by combining rigorous technical analysis with structured decision-support frameworks. We apply lifecycle assessment, cost modelling, and environmental impact methodologies to ensure decisions are grounded in evidence and aligned with regulatory expectations. Recognising the long timescales inherent in radioactive waste management, we support adaptive planning and R&D roadmaps, helping clients prioritise investments and prepare for evolving requirements.

Through our global network of strategic partners and associates, we bring together deep subject matter expertise and international experience in advising governments and regulators through critical licensing milestones and programme decisions.

How we can help

- Regulatory digitalisation
- Multi-criteria decision frameworks
- Optioneering support
- Business cases for government
- Pan-European consultation facilitation
- Stakeholder engagement
- Cost modelling
- Environmental impact assessment
- Lifecycle assessment

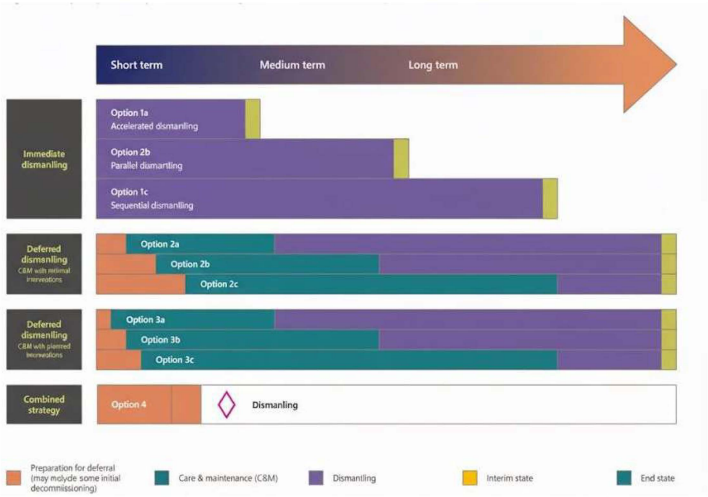
Additional related expertise

- R&D and RD&D road mapping
- Adaptive planning frameworks
- Policy and standards alignment
- Consensus building

Our six service offerings:

05 | Roadmaps, Options Analysis & Strategic Decision Frameworks

Project Overview



Cost optimisation studies to inform NPP decommissioning strategies

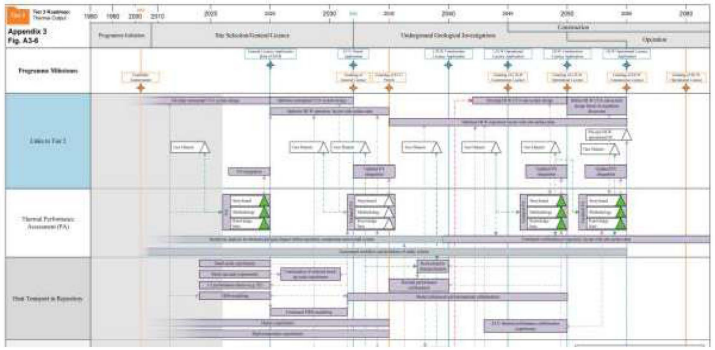
Commissioned by a European nuclear regulator, this study explores digital strategies to optimise decommissioning costs for two legacy nuclear power plant. It leveraged integrated data ecosystems, predictive modelling, and scenario analytics to assess dismantling workflows, waste logistics, and site restoration. Advanced lifecycle cost simulations and benchmarking tools enabled transparent, risk-informed decision-making. Critically, the digital framework supports strategic national choices, such as whether to maintain one reactor in care and maintenance until another is retired, enabling joint decommissioning, or to proceed sequentially by quantifying cost, risk, and operational trade-offs in real time across multiple planning horizons.



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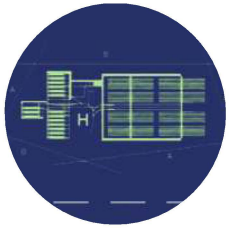


Strategic Roadmaps for 100yr+ Programmes

MCM supports Geological disposal implementers with programme-wide roadmap development, integrating design adaptations and key underpinning RD&D needs. Built on over 5 years of collaboration, we are currently working with Nagra (Switzerland) in a key optimisation phase to aid them in preparing their 2026 R&D update. This includes alignment with their 2022 RD&D Vision document, ensuring continuity across strategic priorities. In parallel, we're commissioned by NWS UK to develop roadmaps across all UK GDF RD&D topics - mapping critical paths and R&D needs through to first waste emplacement. Our approach blends technical rigour with strategic foresight, enabling both organisations to navigate complexity, engage stakeholders, and deliver long-term goals.
To see more: https://nagra.ch/wp-content/uploads/2022/09/20220909_RDD-Vision_Broschure.pdf

Our six service offerings:

06 | Concept Development & Engineering Feasibility



Overview

The MCM Approach

MCM provides comprehensive engineering design support spanning site identification through to operational readiness for geological disposal facilities. We combine geotechnical expertise with systems engineering to develop feasible, constructible disposal concepts that can be safely operated over the facility lifecycle.

Our approach addresses the critical engineering challenges of underground construction, waste emplacement logistics, and long-term operational sustainability whilst maintaining flexibility for evolving waste inventories and regulatory requirements.

The MCM Offering

We support clients in developing disposal concepts from initial concept of operations development through to detailed engineering feasibility assessment. This includes evaluating rock volume adequacy, disposal area geometry, construction methodology, and operational logistics. Our work integrates geotechnical analysis with thermal dimensioning, structural engineering, and lifecycle cost assessment to ensure proposed concepts are technically sound, economically viable, and operationally practical.

We apply structured engineering analysis to demonstrate constructability, operability, and retrievability of disposal concepts. We evaluate construction techniques suited to specific geological settings, assess support requirements for safe excavation, and develop operational process flows addressing material handling, backfilling, and sealing operations. Our thermal and geotechnical modelling informs disposal facility layout optimisation, ensuring adequate separation between disposal areas whilst maximising efficient use of underground space.

How we can help

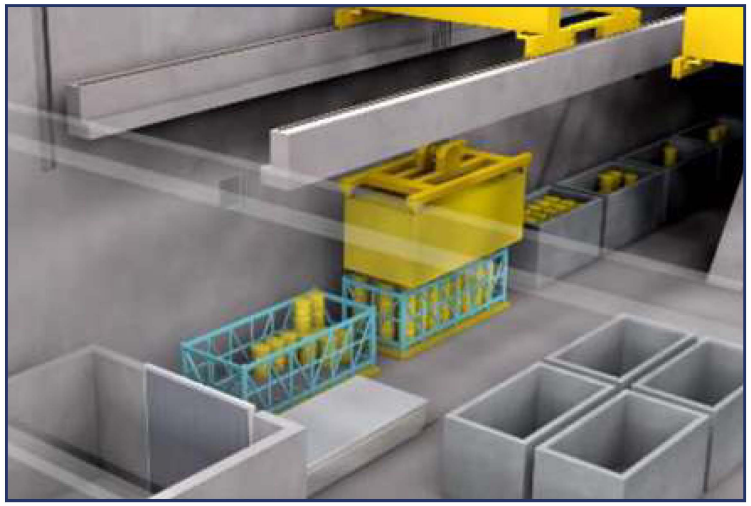
- Concept of operations development
- Functional analysis
- Strategic options and feasibility studies
- Multi-criteria evaluation (MAUA)
- Site identification and rock volume assessment
- Disposal concept development
- Constructability and geotechnical analysis
- GDF layout optimisation
- Operational feasibility assessment

Additional related expertise

- Stage gate and design review support
- Interface management
- Design principles compliance
- Technology readiness and RD&D prioritisation

06 | Concept Development & Engineering Feasibility

Project Overview



Inlet Cell Design Development for the Safe Handling of Radioactive Waste Underground

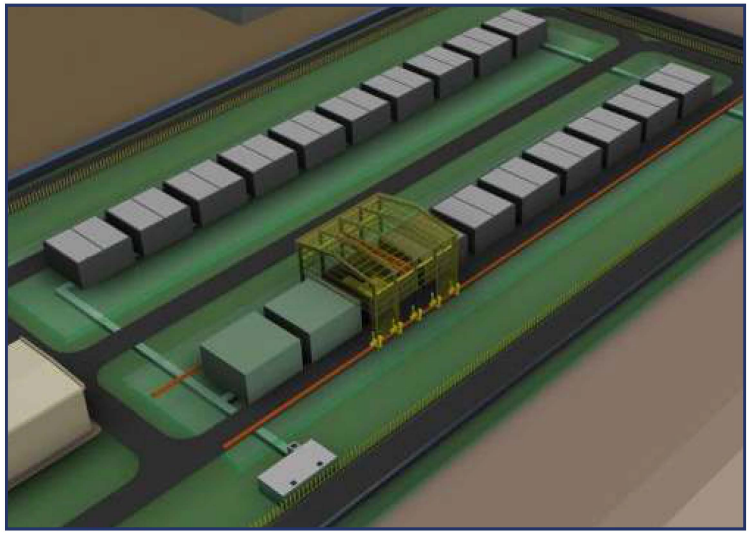
MCM delivered a multi-year project, with collaboration partners (Arup) to develop the conceptual design of an Unshielded Intermediate Level Waste (UILW) handling facility for the UK's future Geological Disposal Facility (GDF). Central to this was the underground inlet cell, a shielded space enabling remote unpacking and transfer of waste units from transport containers to disposal areas. MCM advanced the design from TRL 2 to TRL 3, demonstrating feasibility across diverse geological settings. Using systems engineering and proven technologies, the team embedded the design within a BIM framework to ensure traceability, coordination, and adaptability for future implementation and decommissioning.



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Modular Design for Safe Waste Disposal in Iraq

MCM, with collaboration partners (BGE Tech GmbH, JAVYS, NUKEM Tech.) supported the development of Iraq's first engineered radioactive waste disposal facility, commissioned by the Ministry of Science and Technology with European Commission support. Working alongside partners, MCM contributed to the conceptual and detailed design of a near-surface modular facility at Al-Tuwaitha, with capacity for over 5,000 m^3 of packaged short-lived low and intermediate level waste. The project integrated safety, licensing, and regional site assessment, including geology, hydrogeology, and seismicity studies and inventory studies (both led by MCM) into a Multi-Attribute Analysis framework. The resulting design supports Iraq's national decommissioning strategy and is progressing toward approval and implementation.

Our team

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Our Affiliations



Our particular strength is in the integration of complex scientific, technical, economic and societal information to identify, quantify and justify practical and strategic waste management options.

MCM is a UK-based, employee-owned SME providing world-class expertise in radioactive waste management - based at the Science and Technology Faciliaties Council (STFC) Campus (near Oxford), plus regional offices in Bristol and Belfast. While proudly rooted in the UK, the company supports clients and partners globally, including organisations in France, Germany, Finland, Sweden, Switzerland, Japan, Taiwan, Australia, South Africa, the UAE, and the USA, as well as international agencies such as the IAEA and the OECD NEA.

Our Clients


AECOM
ANDRA
Agence nationale pour la gestion des déchets radioactifs
Australian Government
Department of Industry, Science and Resources
Australian Radioactive Waste Agency
BGE TEC
BGE TECHNOLOGY GmbH
European Commission
amentum
ARUP
ATKINS
ERDO working group
Jacobs
JAEA
Japan Atomic Energy Agency
nagra
NDA
Nuclear Decommissioning Authority
NUMO
原子力発電環境整備機構
Nuclear Waste Services
台灣電力公司
TAIWAN POWER COMPANY
U.S. DEPARTMENT OF ENERGY
SKB
Sellafield Ltd
COVRA
FANR
الهيئة الاتحادية للرقابة النووية
Federal Authority for Nuclear Regulation
Strål säkerhets myndigheten
Swedish Radiation Safety Authority
IAEA
axpo
OBAYASHI
KAERI
Korea Atomic Energy Research Institute

Our Experts



David Holton

Director & Chief Technologist

David leads MCM's global post-closure modelling work, bringing 30+ years' expertise in radioactive waste disposal and complex project integration.



Martin Kelly

Radiological (& non-radiological) Assessment Lead

Martin is MCM's hydrogeological modelling lead, with 28+ years' experience in dose assessment and GoldSim-based system modelling.



David Roberts

Thermal Dimensioning Tool & Digital Modelling Specialist

David is MCM's thermo-hydro-mechanical modelling expert, specialising in fracture evolution and heat effects in GDF rock systems.



Steve Joyce

Data Integration & Interoperability Lead

Steve has 20+ years' experience in multi-disciplinary modelling for geological disposal. He specialises in synthesising complex site data into coherent, long-term performance assessments.

Our Experts



Jenny Smallwood

Database Architecture & Uncertainty Management Specialist

Jenny is MCM's database architecture and analytics lead, applying her physics and modelling expertise to build scalable, high-integrity data systems to power our modelling toolkits.



Robin Shannon

AI & Analytics Lead

Robin leads MCM's intelligence capability - spanning simulation, modelling, AI-driven decision-making, machine learning, and autonomy - applying these technologies across our digital ecosystem to enhance insight and efficiency.



Alastair Clark

Systems Design & Requirements Management Lead

Ally is MCM's Managing Director and design authority, specialising in aligning engineered disposal concepts with regulatory and operational constraints.



Jake Kinghorn Mills

Repository Modelling & Optimisation Engineer

Jake is MCM's repository modelling and optimisation engineer, focused on simulating disposal system performance and refining tunnel and vault-scale design strategies using full-lifecycle evaluation methodologies.

Our Experts



Tara Beattie

Digital Integration & Visualisation Specialist

Tara leads digital integration at MCM, connecting complex models with large knowledge bases and translating insights for decision-makers.



Joel Mendelsohn

Computational Physics Specialist

Joel applies mathematical and theoretical physics to support advanced modelling, data workflows, and integration across MCM's digital ecosystem and wider toolkits.

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