

EO4OG Challenges - List view

Challenge	Source	Theme	Topic	Generic	Pre- license	Explore	Develop	Produce	Decomm'n
Air quality (emissions) monitoring	OTM	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	0	1	2	3	1
Air quality monitoring on an airshed and site specific basis	Hatfield	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	2	2	2	4	0
Anticipating areas of high seismic impedance	OTM	Seismic planning	Areas of poor coupling	on-shore	2	3	0	0	0
Assess coastal environment for infrastructure planning	Hatfield	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	3	1	4	2	1
Assess and map forest fire risk and provide situational awareness of fire occurrence	Hatfield	Seismic planning	Identification of environmentally sensitive areas	on-shore	1	2	2	2	1
Assess fragmentation of natural habitat and cumulative disturbance	Hatfield	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	3	3	3	2	2
Assess forest characteristics to plan access and assess hazards	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	2	4	2	2	1
Assessing ground deformation to support enhanced recovery operations	Hatfield	Subsidence monitoring	Reservoir management	on-shore	0	1	1	4	2
Assess habitat for key species for environmental baseline and/or impact assessment	Hatfield	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	2	3	4	1	1
Assess and manage forest fire risk to facilities and infrastructure	Hatfield	Environmental monitoring	Natural hazard risk analysis	on-shore	0	4	4	4	2
Assess potential project site for historical use	Hatfield	Logistics planning and operations	Baseline mapping of terrain and infrastructure	on-shore	1	0	4	3	3
Assessing the social impact of construction work	OTM	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	4	4	4	4	4
Assessing terrain stability for infrastructure planning in permafrost environments	Hatfield	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	2	2	3	4	0
Assessment of duricrusts and rock excavability	Hatfield	Surface geology mapping	Engineering geological evaluation	on-shore	1	2	3	1	1
Assessment of infrastructure placement and effects to the surrounding environment	Hatfield	Subsidence monitoring	Infrastructure monitoring	on-shore	2	2	4	4	0
Avoiding aerial mapping restrictions	OTM	Logistics planning and operations	Baseline mapping of terrain and infrastructure	on-shore	1	1	1	1	1
Baseline elevation data for project planning and design	Hatfield	Logistics planning and operations	Baseline mapping of terrain and infrastructure	on-shore	1	3	3	1	2
Baseline imagery for project planning and design	Hatfield	Logistics planning and operations	Facility siting, pipeline routing and roads						
Baseline and monitoring of areas with active faults and subsidence	Hatfield	Subsidence monitoring	Land motion relating to fault lines or other causes	on-shore	2	3	3	3	2
Change detection of coastline migration	OTM	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	1	0	3	0	0
Change detection for competitive intelligence	OTM	Logistics planning and operations	Monitoring of assets	on-shore	3	3	4	0	0
Characterisation of surface/near-surface structural geological properties for infrastructure planning	Hatfield	Surface geology mapping	Engineering geological evaluation	on-shore	1	2	3	1	1
Coastal elevation data for tsunami risk analysis	Hatfield	Environmental monitoring	Natural hazard risk analysis	on-shore	0	4	4	4	0
Coastal morphology	CLS	Environmental monitoring		off-shore	0	0	4	0	0

Coastal resource mapping of mangroves, coral-reefs, wetlands and sandbanks	C-CORE	Environmental monitoring		off-shore	1	1	1	1	1
Coastal sediment dynamics, estuarine fronts and land-ocean interactions	C-CORE	Environmental monitoring		off-shore	0	1	1	1	0
Coastal upwelling	C-CORE	Environmental monitoring		off-shore	1	1	1	1	1
Commercial and recreational fisheries	C-CORE	Environmental monitoring		off-shore	2	2	2	2	2
Commercial shipping	C-CORE	Environmental monitoring		off-shore	2	0	0	0	0
Convective downbursts	C-CORE	Metocean		off-shore	1	3	1	3	2
Creating an ecosystem inventory prior to exploration	OTM	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	3	4	0	0	0
Creating basemaps in politically sensitive regions	OTM	Logistics planning and operations	Baseline mapping of terrain and infrastructure	on-shore	2	2	0	0	0
Current at depth observations	C-CORE	Metocean		off-shore	2	4	3	4	3
Detecting ecosystem damages	OTM	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	0	2	2	4	4
Detecting hydrocarbon leaks	OTM	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	0	0	1	3	2
Detection and monitoring of pollutant discharges	C-CORE	Environmental monitoring		off-shore	1	3	3	3	3
Detection of oil contamination and oil seeps	Hatfield	Logistics planning and operations	Monitoring of assets	on-shore	3	0	0	4	0
Detection of unexpected methane leakage on a regional basis	Hatfield	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	2	3	3	4	0
Determine historical ground movement for infrastructure planning	OTM	Subsidence monitoring	Infrastructure monitoring	on-shore	3	3	3	0	1
Determine historical ground movement for pipeline routing	OTM	Subsidence monitoring	Infrastructure monitoring	on-shore	3	1	1	0	0
Distribution and abundance of marine animals	C-CORE	Environmental monitoring		off-shore	3	3	3	3	3
Distribution and abundance of sea birds	C-CORE	Environmental monitoring		off-shore	3	3	3	3	1
Drilling survey preparation: Environmental conditions	CLS	Environmental monitoring		off-shore	0	0	4	0	0
Drilling survey preparation: Metocean conditions hindcast and forecast	CLS	Metocean		off-shore	0	4	0	0	0
Early identification of potential hydrocarbon basins	OTM	Surface geology mapping	Mapping geological features	on-shore	4	3	1	0	0
Ecosystem valuation of potential sites	OTM	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	4	2	0	0	0
Efficiency of vessels and helicopters operations	CLS	Metocean		off-shore	0	0	0	4	0
Enabling survey to understand structural properties of the sub-surface for infrastructure planning	OTM	Surface geology mapping	Engineering geological evaluation	on-shore	2	2	3	1	1
Environmental conditions	CLS	Environmental monitoring		off-shore	4	0	0	0	0
Environmental monitoring	CLS	Environmental monitoring		off-shore	0	0	0	0	4
Estimating ground bearing capacity	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	3	2	3	1	1
Estimation of the climate change impact	CLS	Environmental monitoring		off-shore	0	0	4	0	0
Evaluation of the efficiency of the structure	CLS	Metocean		off-shore	0	0	4	0	0
Firemapping	OTM	Logistics planning and operations	Support to surveying crews for planning surveys and H&S	on-shore	3	3	3	3	3
Fish and fish habitat	C-CORE	Environmental monitoring		off-shore	3	3	3	3	3

Flagging environmentally sensitive areas prior to seismic surveys	OTM	Seismic planning	Identification of environmentally sensitive areas	on-shore	2	4	0	0	0
Floodplain mapping	OTM	Environmental monitoring	Natural hazard risk analysis	on-shore	0	2	2	2	2
Floodplain mapping and understanding flood extent and flood frequency	Hatfield	Environmental monitoring	Natural hazard risk analysis	on-shore	1	4	4	3	1
Forecasting landslide locations	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	3	2	4	0	0
Forecasting river migration patterns	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	3	2	4	0	0
Forecasting sand dune migration	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	2	1	3	2	3
Funnel-clouds and waterspouts	C-CORE	Metocean		off-shore	1	3	1	3	2
Geohazard exposure analysis	OTM	Environmental monitoring	Natural hazard risk analysis	on-shore	4	0	0	0	0
Geological and terrain base maps for development of environmental baseline	OTM	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	2	2	0	0	0
Global requirements on EO products	CLS	Environmental monitoring		off-shore	1	1	1	1	1
Hail	C-CORE	Metocean		off-shore	1	2	1	2	1
Historic metocean data for high level risk assessment	CLS	Metocean	Risk assessment	off-shore	4	0	0	0	0
Historic records of currents at depth	C-CORE	Metocean		off-shore	3	4	4	3	4
Historical records for surface currents	C-CORE	Metocean		off-shore	3	4	4	3	3
Historic records for waves	C-CORE	Metocean		off-shore	3	4	4	3	3
Historic records for winds	C-CORE	Metocean		off-shore	3	3	4	4	4
Historic tropical storm/tropical cyclone probability and tracks	C-CORE	Metocean		off-shore	2	4	3	4	3
Hurricane tracks	CLS	Metocean		off-shore	0	4	0	0	0
Ice accretion	C-CORE	Metocean		off-shore	2	3	3	4	2
Identification of archaeological or burial sites	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	2	4	3	2	2
Identification of cultural heritage and archaeological assessment	Hatfield	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	2	4	4	0	0
Identification of fault lines	OTM	Surface geology mapping	Structural interpretation	on-shore	4	4	0	1	0
Identification of ground-water table to reduce potential issues during seismic activity	Hatfield	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	0	3	2	2	2
Identification of problem soils	Hatfield	Surface geology mapping	Engineering geological evaluation	on-shore	1	2	3	2	1
Identification of road or track for logistics planning	OTM	Logistics planning and operations	Baseline mapping of terrain and infrastructure	on-shore	1	2	4	1	2
Identification of seasonal environment changes e.g. migration patterns	OTM	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	1	2	2	2	2
Identification of seasonal obstructions to logistics activities	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	2	2	3	1	1
Identification of slope instability	Hatfield	Surface geology mapping	Engineering geological evaluation	on-shore	1	2	3	2	1
Identify areas with soft sediments to avoid strong attenuation	Hatfield	Seismic planning	Areas of poor coupling	on-shore	1	3	2	1	1
Identify areas with soft sediments to plan access and assess hazards	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	2	4	2	2	2
Identify claypan surfaces to be avoided	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	2	3	2	2	1

Identify communication between producing zones	OTM	Subsidence monitoring	Reservoir management	on-shore	0	0	0	2	0
Identify causes of geological movement	OTM	Surface geology mapping	Structural interpretation	on-shore	3	3	0	2	0
Identify discreet lithology	Hatfield	Surface geology mapping	Lithological discrimination	on-shore	1	3	2	1	0
Identify geohazards and landscape change rates	Hatfield	Surface geology mapping	Terrain evaluation and geo-morphology characterisation	on-shore	1	3	3	1	0
Identify geological structure through landform	Hatfield	Surface geology mapping	Structural interpretation	on-shore	1	3	2	1	0
Identify geophysical properties of the sub-surface	Hatfield	Surface geology mapping	Engineering geological evaluation	on-shore	1	3	3	2	0
Identify ice thickness and status for travel safety	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	1	3	1	1	1
Identify lake, river and coastal ice grounding status for data quality	Hatfield	Seismic planning	Areas of poor coupling	on-shore	1	3	2	1	1
Identify land parcel boundaries for impact compensation	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	1	3	1	1	1
Identify optimal seasonal land-use to reduce permit costs - commercial and subsistence practices	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	1	3	1	1	1
Identify permafrost zone for data analysis	Hatfield	Seismic planning	Areas of poor coupling	on-shore	2	3	1	1	1
Identify restricted areas that must be avoided	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	1	3	1	1	1
Identify rivers, lakes and wet areas to apply safe set-back distances	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	2	4	2	2	2
Identify rock-strewn areas to point loading	Hatfield	Seismic planning	Areas of poor coupling	on-shore	1	3	2	1	1
Identify sabkahs / salt-lake areas	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	1	3	1	1	1
Identify sensitive habitat to minimise and manage impacts of activities	Hatfield	Seismic planning	Identification of environmentally sensitive areas	on-shore	1	3	3	2	1
Identify soft ground to reduce environmental impacts	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	1	3	1	1	1
Identify sub-surface infrastructure for planning of pipeline crossings	Hatfield	Logistics planning and operations	Baseline mapping of terrain and infrastructure	on-shore	0	0	4	2	2
Identify steep slopes to assess potential constraints to access	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	2	4	2	2	1
Identify steep slopes to assess potential constraints to access in forested areas	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	2	4	2	2	1
Identify soft and hard ground as areas of potentially poor coupling	Hatfield	Seismic planning	Areas of poor coupling	on-shore	2	3	2	1	1
Identify up-to-date general land-use patterns to plan access and apply safe set-back distances	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	2	4	2	1	1
Identify UXO related hazards	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	1	3	1	1	1
Identifying conflicting sources of seismic signals	OTM	Seismic planning	Areas of poor coupling	on-shore	2	4	0	0	0
Identifying effect of fault line reactivation	OTM	Subsidence monitoring	Land motion relating to fault lines or other causes	on-shore	0	0	0	3	2
Identifying existing linear routes for co-location of pipelines in wilderness areas	Hatfield	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	1	3	3	0	0
Identifying existing O&G infrastructure for facility site selection	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	2	2	3	1	1
Identifying ground conditions susceptible to poor coupling	OTM	Seismic planning	Areas of poor coupling	on-shore	2	3	0	0	0

Identifying munitions debris (UOX)	OTM	Seismic planning	Identification of adverse terrain for trafficability	on-shore	3	4	3	3	4
Identifying near surface infrastructure	OTM	Logistics planning and operations	Baseline mapping of terrain and infrastructure	on-shore	3	4	3	0	3
Identifying potential hydrocarbon seepage	OTM	Surface geology mapping	Lithological discrimination	on-shore	4	3	1	0	0
Identifying seasonal terrain changes eg for access	OTM	Surface geology mapping	Terrain evaluation and geo-morphology characterisation	on-shore	2	3	0	0	0
Identifying soft ground for seismic vehicles	OTM	Seismic planning	Identification of adverse terrain for trafficability	on-shore	2	2	0	0	0
Identifying sources of building resources	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	4	4	2	1	1
Identifying steep terrain for seismic vehicles	OTM	Seismic planning	Identification of adverse terrain for trafficability	on-shore	2	3	0	0	0
Identifying unregulated overhead power lines	OTM	Logistics planning and operations	Support to surveying crews for planning surveys and H&S	on-shore	0	2	2	0	2
Identifying variations in trafficability for seismic vehicles	OTM	Seismic planning	Identification of adverse terrain for trafficability	on-shore	2	3	0	0	0
Information on presence and abundance of deep water fauna	C-CORE	Environmental monitoring		off-shore	4	3	3	3	3
Information on the intertidal and shallow marine environment	C-CORE	Environmental monitoring		off-shore	1	1	1	1	1
Inputs for numerical model	CLS	Metocean		off-shore	4	0	0	0	0
Land cover and land use for environmental baseline and/or impact assessment	Hatfield	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	0	2	4	4	2
Land use mapping to detect the social impact of O&G developments	OTM	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	1	1	2	3	1
Lightning	C-CORE	Metocean		off-shore	1	3	1	3	2
Linement mapping	Hatfield	Surface geology mapping	Mapping geological features	on-shore	1	3	2	1	0
Locating repeater stations for communications infrastructure	OTM	Logistics planning and operations	Support to surveying crews for planning surveys and H&S	on-shore	2	4	3	1	3
Logistics planning for emergency events	OTM	Logistics planning and operations	Support to surveying crews for planning surveys and H&S	on-shore	3	3	3	3	3
Management of surface impacts due to ground deformation from operations	Hatfield	Subsidence monitoring	Infrastructure monitoring	on-shore	2	1	1	4	2
Map coastal habitat and built environment /settlement sensitivity to strengthen tactical oil spill response and preparedness	Hatfield	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	1	1	3	4	3
Map and monitor induced seismic hazards	Hatfield	Environmental monitoring	Natural hazard risk analysis	on-shore	2	3	3	4	2
Mapping of environmental degradation (change)	OTM	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	0	2	4	4	4
Mapping of forest extent and quality for environmental baseline and/or impact assessment	Hatfield	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	1	2	4	2	2
Mapping land cover trends over the project area	Hatfield	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	3	1	3	2	3
Metocean forecast to avoid downtime	CLS	Metocean		off-shore	0	0	4	0	0
Metocean monitoring	CLS	Metocean		off-shore	0	0	0	0	5
Model validation	CLS	Metocean		off-shore	4	0	0	0	0
Monitoring air quality related to seasonal fires	Hatfield	Environmental monitoring	Natural hazard risk analysis	on-shore	0	3	3	3	0
Monitoring assets for risk management	Hatfield	Logistics planning and operations	Support to surveying crews for planning surveys and H&S	on-shore	0	2	3	4	3

Monitoring carbon capture storage reservoir leaks	Hatfield	Subsidence monitoring	Reservoir management	on-shore	2	2	2	3	3
Monitoring effectiveness of steam assisted gravity drainage operations	Hatfield	Subsidence monitoring	Reservoir management	on-shore	1	2	2	4	3
Monitoring flash floods	OTM	Environmental monitoring	Natural hazard risk analysis	on-shore	1	3	0	1	1
Monitoring ground movement along pipelines	OTM	Subsidence monitoring	Infrastructure monitoring	on-shore	0	0	2	4	3
Monitoring hydrocarbon leaks	OTM	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	0	0	0	4	0
Monitor induced access corridors to assess indirect impact or effects as a result of project development	Hatfield	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	0	2	4	4	3
Monitoring chlorophyll-a productivity and harmful algal blooms (HAB)	C-CORE	Environmental monitoring		off-shore	3	3	3	3	3
Monitoring lake and wetlands levels and recharge rates following water use for exploration/operations	Hatfield	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	1	3	3	3	2
Monitoring landfall site recovery and coastal vegetation	C-CORE	Environmental monitoring		off-shore	1	1	1	1	1
Monitoring local communities and land use in the project area	Hatfield	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	1	3	3	4	3
Monitor on-shore pipeline right-of-way to evaluate successions of vegetation communities	Hatfield	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	1	0	2	3	2
Monitor pipeline corridor hazards	Hatfield	Logistics planning and operations	Monitoring of assets	on-shore	0	0	4	4	2
Monitoring of pipeline right-of-way for third-party mechanical damage	Hatfield	Logistics planning and operations	Monitoring of assets	on-shore	0	0	0	4	0
Monitor potential pipeline corridor encroachment by communities	Hatfield	Logistics planning and operations	Monitoring of assets	on-shore	3	0	3	4	2
Monitoring waste management practices	C-CORE	Environmental monitoring		off-shore	0	1	1	1	1
Monitoring pipeline stability in discontinuous permafrost	Hatfield	Subsidence monitoring	Infrastructure monitoring	on-shore	3	2	3	4	0
Monitoring water discharge/drill cuttings	CLS	Environmental monitoring		off-shore	0	4	0	0	0
Monitoring of water quality / turbidity during operations	CLS	Environmental monitoring		off-shore	0	0	4	0	0
Monitoring natural fault movement	OTM	Subsidence monitoring	Land motion relating to fault lines or other causes	on-shore	0	0	0	2	0
Monitoring re-vegetation	OTM	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	0	0	1	2	4
Monitor stability of surface reservoirs such as settling ponds	Hatfield	Subsidence monitoring	Infrastructure monitoring	on-shore	2	1	1	4	3
Natural and other existing oil seeps	C-CORE	Environmental monitoring		off-shore	3	3	3	3	3
Obtaining baseline land use for pipeline route planning	Hatfield	Logistics planning and operations	Baseline mapping of terrain and infrastructure	on-shore	1	2	4	1	2
Obtaining detailed terrain mapping for DEM correction	OTM	Surface geology mapping	Terrain evaluation and geo-morphology characterisation	on-shore	3	4	3	1	3
Planning and assessing borrow pits as source of aggregate material	Hatfield	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	0	1	3	1	2
Planning around protected sites	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	2	2	2	0	2
Planning bridging through a tropical forest	Hatfield	Seismic planning	Identification of adverse terrain for trafficability	on-shore	1	3	1	1	1

Planning heliports, camps and drop-zones in forested areas	Hatfield	Seismic planning	Identification of environmentally sensitive areas	on-shore	1	2	2	1	1
Planning secondary surveys	OTM	Logistics planning and operations	Support to surveying crews for planning surveys and H&S	on-shore	3	2	2	0	0
Pollution monitoring	CLS	Environmental monitoring		off-shore	0	0	0	4	0
Pre-licensing site selection	OTM	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	4	0	0	0	0
Recommendation for the design of infrastructure	CLS	Metocean		off-shore	0	0	4	0	0
Reconnaissance survey for EIA	OTM	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	2	3	2	0	0
Regulatory verification relating to injection of fracking fluids	OTM	Subsidence monitoring	Reservoir management	on-shore	0	3	3	3	0
Remediation and reclamation monitoring	Hatfield	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	3	1	2	3	4
Remediation monitoring related to agriculture impacts	Hatfield	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	0	3	3	3	3
Remote supervision of operations	OTM	Logistics planning and operations	Monitoring of assets	on-shore	4	4	4	4	4
Resettlement assessment	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	4	0	2	0	0
Safety of marine operations	CLS	Metocean		off-shore	0	0	0	4	0
SAR imagery to detect ships and icebergs	CLS	Environmental monitoring		off-shore	0	0	0	4	0
Scientific independence in environmental monitoring of pollution	C-CORE	Environmental monitoring		off-shore	0	3	3	3	3
Sea level	C-CORE	Metocean		off-shore	1	3	4	4	3
Sea surface temperatures	C-CORE	Metocean		off-shore	1	1	2	2	1
Security and safety	C-CORE	Environmental monitoring		off-shore	0	3	3	3	3
Security of pipelines	OTM	Logistics planning and operations	Monitoring of assets	on-shore	0	0	1	4	0
Seismic survey current velocities	CLS	Metocean		off-shore	0	4	0	0	0
Seismic survey sound propagation properties	CLS	Metocean		off-shore	0	4	0	0	0
Selection of development sites	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	3	1	3	0	0
Selection of the drilling rig	CLS	Metocean		off-shore	0	4	0	0	0
Shipwrecks and other archaeological value areas	C-CORE	Environmental monitoring		off-shore	4	4	0	0	0
Site monitoring	CLS	Environmental monitoring		off-shore	1	2	2	2	2
Situational awareness information on water levels and lake extents and potential flooding	Hatfield	Environmental monitoring	Natural hazard risk analysis	on-shore	1	4	4	3	2
Social baseline information to support compensation and/or resettlement	Hatfield	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	0	2	4	3	2
Squalls	C-CORE	Metocean		off-shore	1	3	3	4	2
Submarine landslides and seabed stability	C-CORE	Environmental monitoring		off-shore	3	3	4	0	0
Subsidence from reservoir draw-down	OTM	Subsidence monitoring	Reservoir management	on-shore	0	0	0	2	0
Surface current observations	C-CORE	Metocean		off-shore	2	4	3	4	3
Surface infrastructure movement relative to sub-surface	OTM	Subsidence monitoring	Infrastructure monitoring	on-shore	0	1	2	3	3
Technical verification relating to injection of fracking fluids	OTM	Subsidence monitoring	Reservoir management	on-shore	0	0	0	3	0

Terrain stability for route planning	Hatfield	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	3	2	3	4	2
Tracking fluid migration in the sub-surface	OTM	Subsidence monitoring	Reservoir management	on-shore	0	0	1	3	1
Tracking groundwater tables	OTM	Subsidence monitoring	Land motion relating to fault lines or other causes	on-shore	0	2	2	2	0
Tracking volume of oil stored	OTM	Logistics planning and operations	Monitoring of assets	on-shore	0	0	0	3	0
Tropical storm/tropical cyclone observations	C-CORE	Metocean		off-shore	2	4	3	4	3
Understanding activity beneath the tree canopy	OTM	Logistics planning and operations	Baseline mapping of terrain and infrastructure	on-shore	4	4	3	3	3
Understanding and predicting changes in hydrological processes	Hatfield	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	2	2	4	3	2
Understand extent of lakes and wet areas for hazard assessment	Hatfield	Environmental monitoring	Natural hazard risk analysis	on-shore	1	4	4	2	1
Understanding hydro-geology	Hatfield	Surface geology mapping	Mapping geological features	on-shore	1	3	3	2	2
Understanding outcrop mineralogy	OTM	Surface geology mapping	Lithological discrimination	on-shore	4	4	0	0	0
Understand temporal and spatial extent of usable fish habitat to maintain acceptable levels	Hatfield	Environmental monitoring	Baseline historic mapping of environment and ecosystems	on-shore	1	1	2	3	0
Understanding the near-surface for anticipating seismic signal absorption properties	OTM	Surface geology mapping	Lithological discrimination	on-shore	2	4	0	0	0
Understanding the near-surface for explosive charge placement	OTM	Seismic planning	Areas of poor coupling	on-shore	2	3	0	0	0
Understanding security situations	OTM	Logistics planning and operations	Facility siting, pipeline routing and roads	on-shore	0	2	2	2	2
Urban encroachment on O&G assets	OTM	Logistics planning and operations	Monitoring of assets	on-shore	0	1	2	3	1
Validating co-ordinates of old wells	OTM	Logistics planning and operations	Baseline mapping of terrain and infrastructure	on-shore	2	2	0	0	0
Vegetation encroachment on O&G assets	OTM	Logistics planning and operations	Monitoring of assets	on-shore	0	0	1	4	2
Visibility	C-CORE	Metocean		off-shore	1	3	3	4	2
Visibility during operations	CLS	Environmental monitoring		off-shore	0	0	4	0	0
Wave observations	C-CORE	Metocean		off-shore	2	4	3	4	3
Water quality monitoring	OTM	Environmental monitoring	Continuous monitoring of changes throughout the lifecycle	on-shore	0	0	0	3	3
Wind observations	C-CORE	Metocean		off-shore	2	4	3	4	3