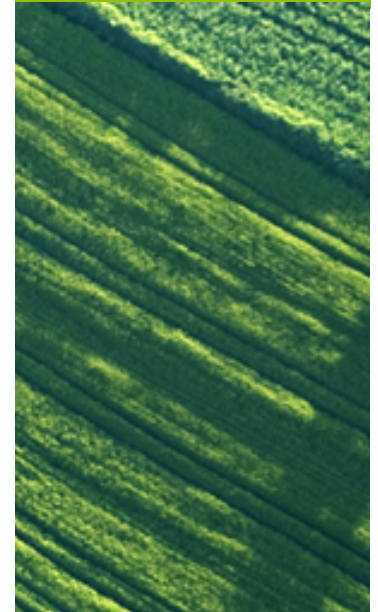


# Environmental and Social Impact Assessment for Onshore Pipelines

**RSK**



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## Session outline



Typical pipeline impacts

Understanding the ESIA process

Delivering the commitments

Managing the schedule and engineering interface – PRACTICAL

# Typical Pipeline Impacts

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# Pipeline vs. crude oil processing facility – what's the difference?



- Moving, linear construction site
- Often through rural areas where people are not used to (or dislike) 'industrial' activity
- Good route selection is fundamental to avoiding and minimising adverse effects on people and the environment
- ESIA provides a methodical approach to reducing impacts further



# Right of way preparation - 1



- Crop loss
- Field severance
- Loss of animal containment through boundary removal
- Habitat severance (note preserved hedge ends)-“orphaned land”
- Footpath severance
- Disruption of farming activities

## Right of way preparation - 2



- Land and livelihood impacts from permanent lease or purchase of RoW
- Soil productivity and loss of crop/land productivity
- Access to land and across RoW
- Irrigation system impacts and severance of land parcels
- Dust when trafficked impacts crops and bees – may lead to compensation claims

# Trenching and pipe lowering



- Access to land and land severance for landowners and users e.g. grazing
- Noise and vibration
- Irrigation system impacts and severance of land parcels “orphaned land”
- Soil compaction
- Public & animal safety – open trench



# Open pipe trench



- Community safety, especially near roads, villages & schools – danger of falling, side collapse & drowning if dewatering not undertaken
- Particular lender focus for BTC – monitored length of open trench as % of total route length



# Rock blasting



- Noise – community and livestock impact
- Dust – community nuisance, impact on crops, bees – lead to possible compensation claims
- Community Safety
- Vibration – needed an Alpaca Management Plan in Peru

## Access roads (new and existing) and traffic



- Noise – community and livestock impact
- Dust – community nuisance, impact on crops, bees – compensation requests
- Community Safety especially through villages
- Vibration – possible impact on integrity of dwellings – may lead to compensation requests
- Deterioration in road condition – may lead to compensation requests

# Use of transportation infrastructure



- Reduced capacity for local users
- Income for the operator(s)
- Opportunity for improvement

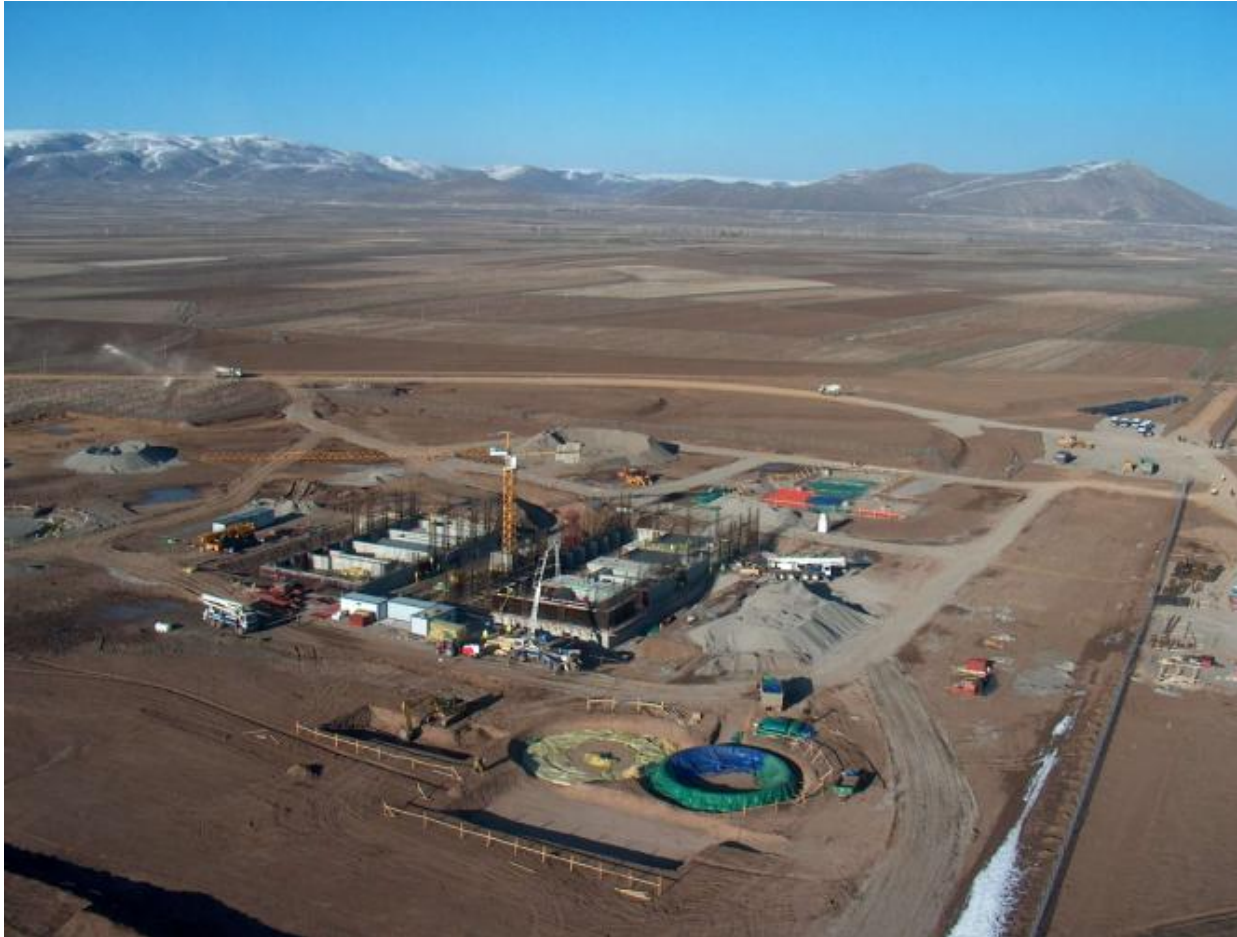


# Construction camps



- Land issues – compensation and reinstatement
- Employment – including opportunities for women (+ve)
- Community health – STDs, epidemics
- Crime and security – open or closed camps? Dry camps?
- Pressure on community resources e.g. electricity supply, water supply
- Disturbance
- Inflation – risk of boom town scenario
- In-migration and change in demographics
- Ethnic / religious tensions (e.g. if workers from different religious, ethnic, cultural background – Tengiz)

# Compressor station operation



- Employment - beneficial impact
- Noise
- Air quality and health impacts
- Visual impact

# Ridge construction



- Need to level a working area
- Restricted working width
- Spoil disposal issue (often includes rocks)
- Erosion risk
- Steep gradients
- Safety of personnel
- Reinstatement
- Remains visible



# Landfalls



- Land take
- Methodology
- Inter-tidal issues e.g. birds feeding on mudflats
- In-shore navigation

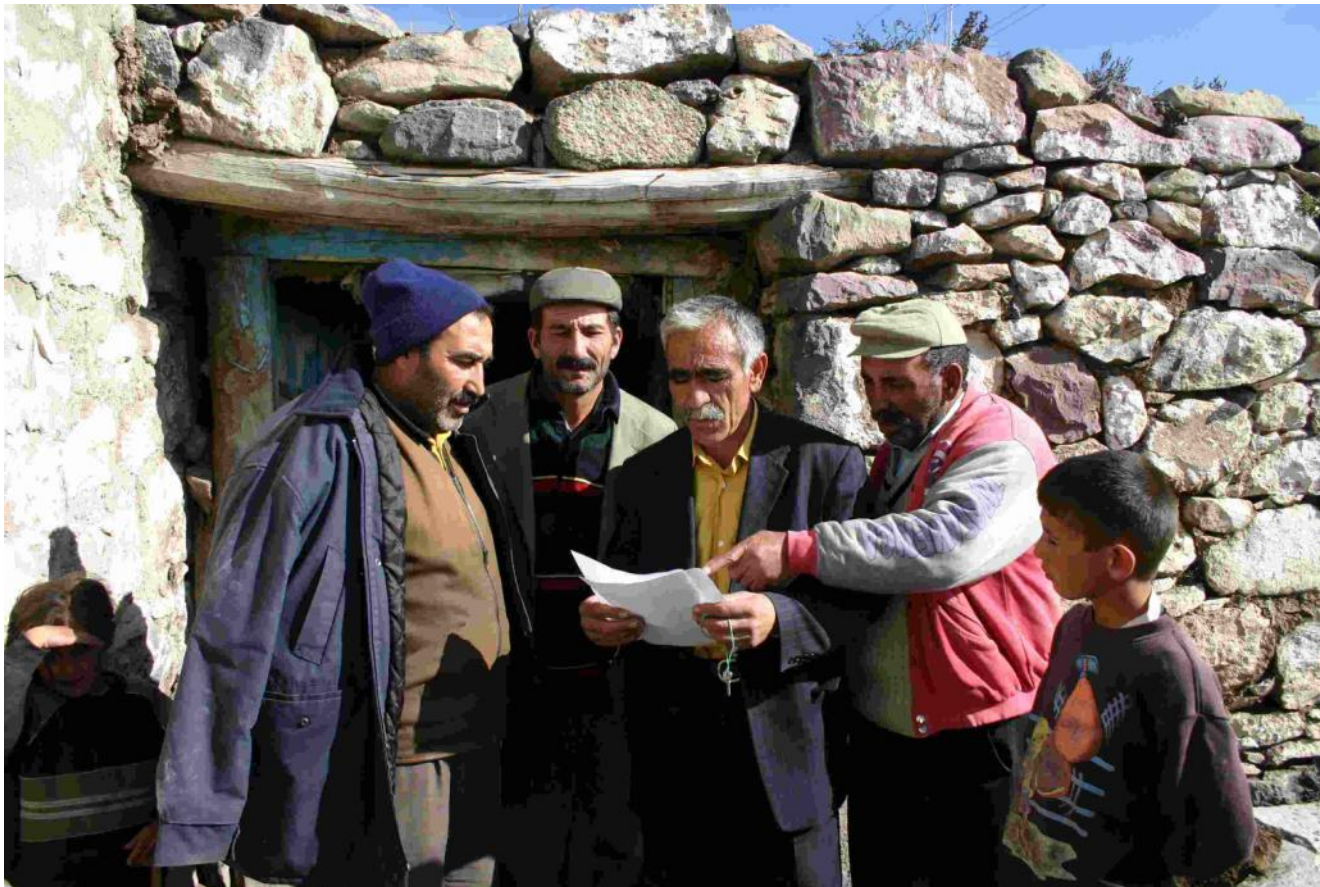
# Marine



- Fisheries and livelihood impacts
- Compensation
- Tourism
- Transport/navigation routes



# Overarching social issues



- Employment
- Training and skills transfer
- Access to energy



# Key environmental issues for onshore pipelines



- Route selection
- Reduced biodiversity
  - habitat degradation & species loss
  - impaired breeding
  - restricted movement
- Archaeology / cultural heritage
- Pollution control
- Waste management
- Traffic management
- Agriculture
- Hydrology and water quality
- Landscape
- Resource use
- Geotechnical stability
- Contamination

# Key social and health issues for onshore pipelines



- Land-take and land appropriation
  - Disruption to agriculture and other land uses
  - Community safety – traffic, excavations, machinery
  - Nuisance – noise, dust, traffic
  - Sterilisation of mineral reserves
  - Restrictions on building
  - Community health – introduction/spread of diseases
  - Reduced remoteness for some communities
- + But also - employment and trade opportunities

# Understanding the ESIA Process

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# ESIA (EIA/ESHIA) purpose



- Provide information for decision-making on the environmental and social consequences of proposed pipeline development for use by:
  - Regulators
  - Client (finance, construction and operational teams)
  - Tendering contractors
  - Lenders (if external finance is required)
  - Non-governmental organisations (NGOs)
  - Local communities
  - Other stakeholders (e.g. local businesses)
- Improve environmental design of the proposed development
- Promote environmentally sound and sustainable development through the identification of appropriate enhancement and mitigation measures
- It is a project planning tool

# EIA - Who? When? How long?



## Who:

- Developer's responsibility
- Independent organisation
  - Best practice, and mandatory in some countries
  - May need to be registered as EIA assessors (e.g. Peru, Tanzania, Turkey)

## When:

- Begin as early as possible
- Iterative process – EIA report submitted with application, but impact assessment continues throughout life of project

## Timescales:

- Need a defined route before undertake detailed field surveys
- Allow at least 1 year for ecological studies
- Consent takes 6 – 12 months in UK

# EIA process



## Screening

- Determine if EIA is required
- *Is EIA a legal requirement?*
- *Is project likely to have significant adverse effects?*

## Scoping

- Determine extent of issues to be addressed in EIA
- Identify studies and consultation required
- Set Terms of Reference for EIA

## Baseline surveys and EIA

- Collect baseline data and information required to assess likely significant environmental (and social) effects
- Develop measures to reduce adverse impacts

## Application & consultation

- Submit EIA to Regulators and publicise application
- Make EIA available and accessible to the public
- Undertake public consultation

## Decision making

- Regulator considers EIA, any other information, representations and comments
- Regulator gives consent with conditions



# Screening - is formal EIA required?



Legislation, thresholds and screening applications determine whether or not formal EIA is required

- EC Directive
  - Oil/gas/chemical pipelines >40km **and** >800mm = mandatory EIA
  - Other oil/gas/chemical pipelines – Member States set thresholds
- UK legislation
  - Pipelines >40km **and** >800mm = mandatory EIA
  - Pipelines >7 bar g **or** through a sensitive area requires a screening opinion (determination) or voluntary EIA
  - Facilities (AGIs etc) > 1ha = screening opinion or voluntary EIA

## Screening application

- Abbreviated, high-level EIA that identifies key issues and likely significant effects

# Scoping



## Review

- Project scope and alternatives (e.g. pipeline routes)
- Regulatory requirements
- Baseline conditions (desk top; site visit)

## Identify

- Sensitive receptors
- Likely significant impacts
- Main mitigation measures
- Data gaps
- Consultation process

## Deliver

- Scoping report
- Proposed Terms of Reference for EIA
- Preliminary Stakeholder Engagement Plan
- **Regulator's approval of ToR**

## Defining the Baseline Environment

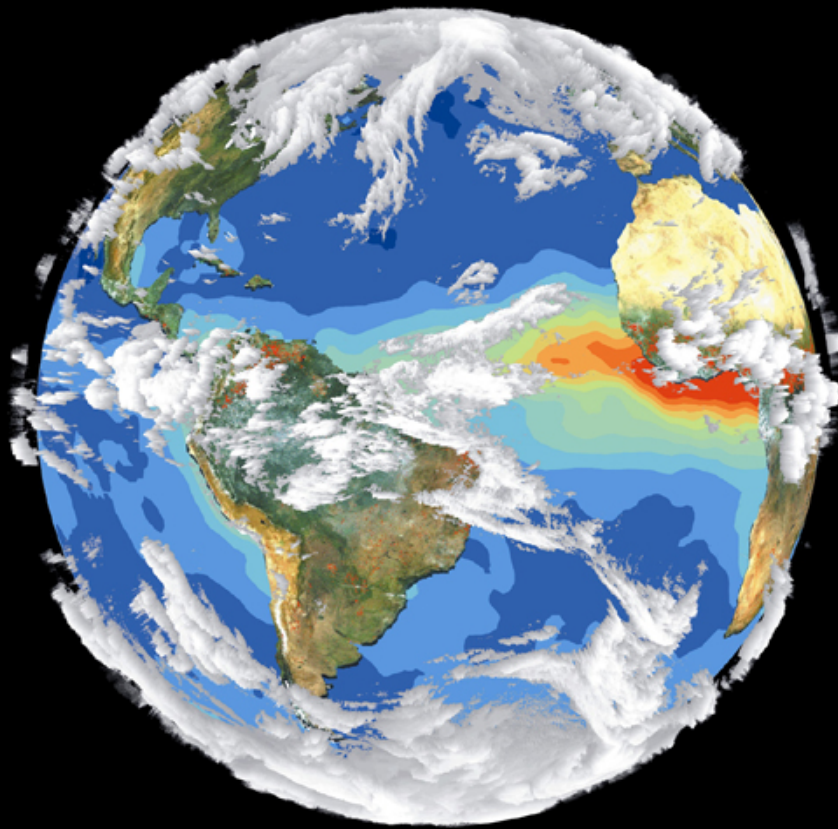
- Sensitive receptors
- Environmental hazards





# Air quality and climate

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# Habitats and plants

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# Animals

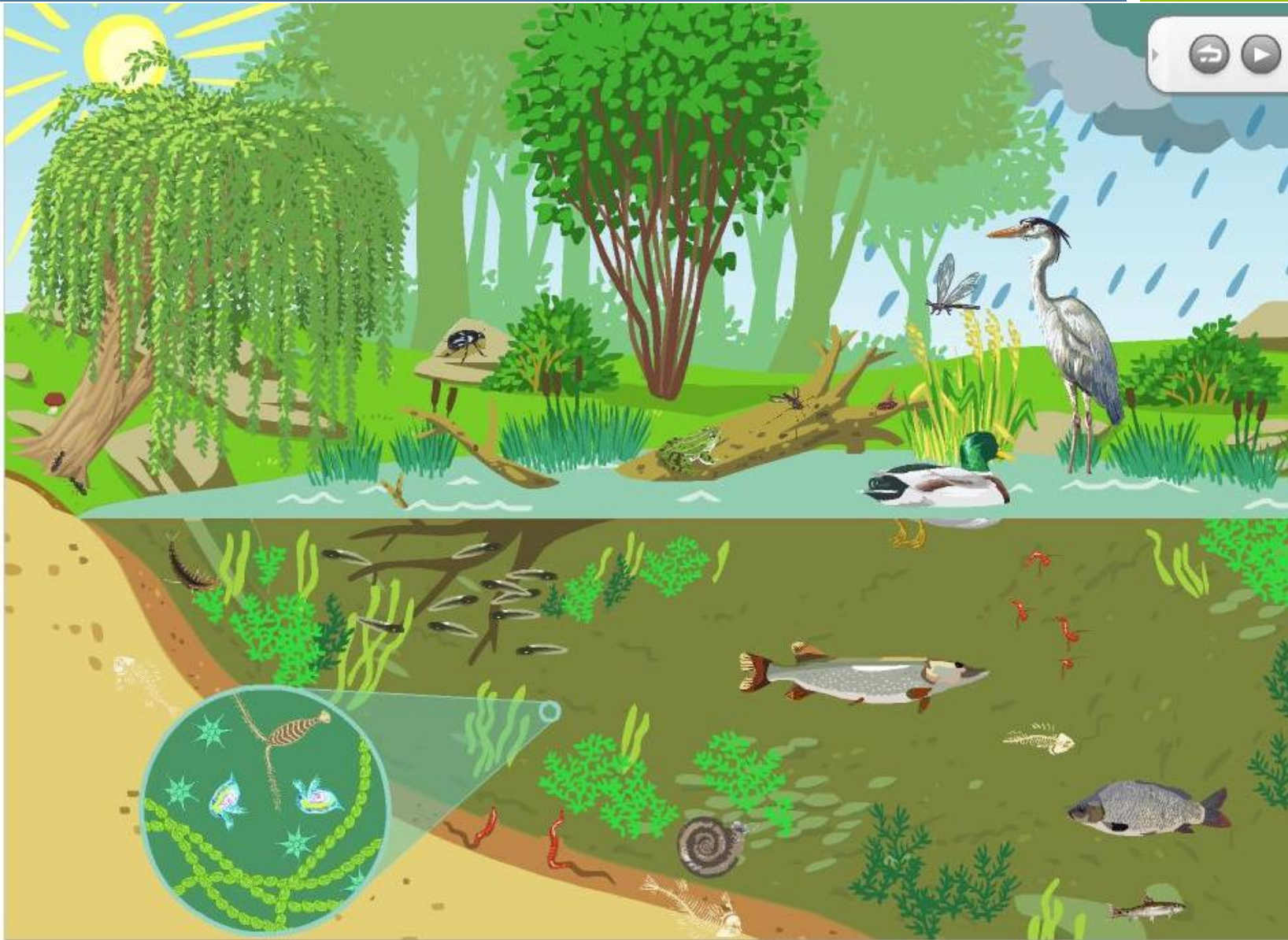
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# Ecosystems

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# Landscape and topography

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# Land use



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# Watercourses and water quality



## Seasonal river flow



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# Cultural heritage





# People

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# Pre-existing contamination

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# Abandoned infrastructure (with contamination)

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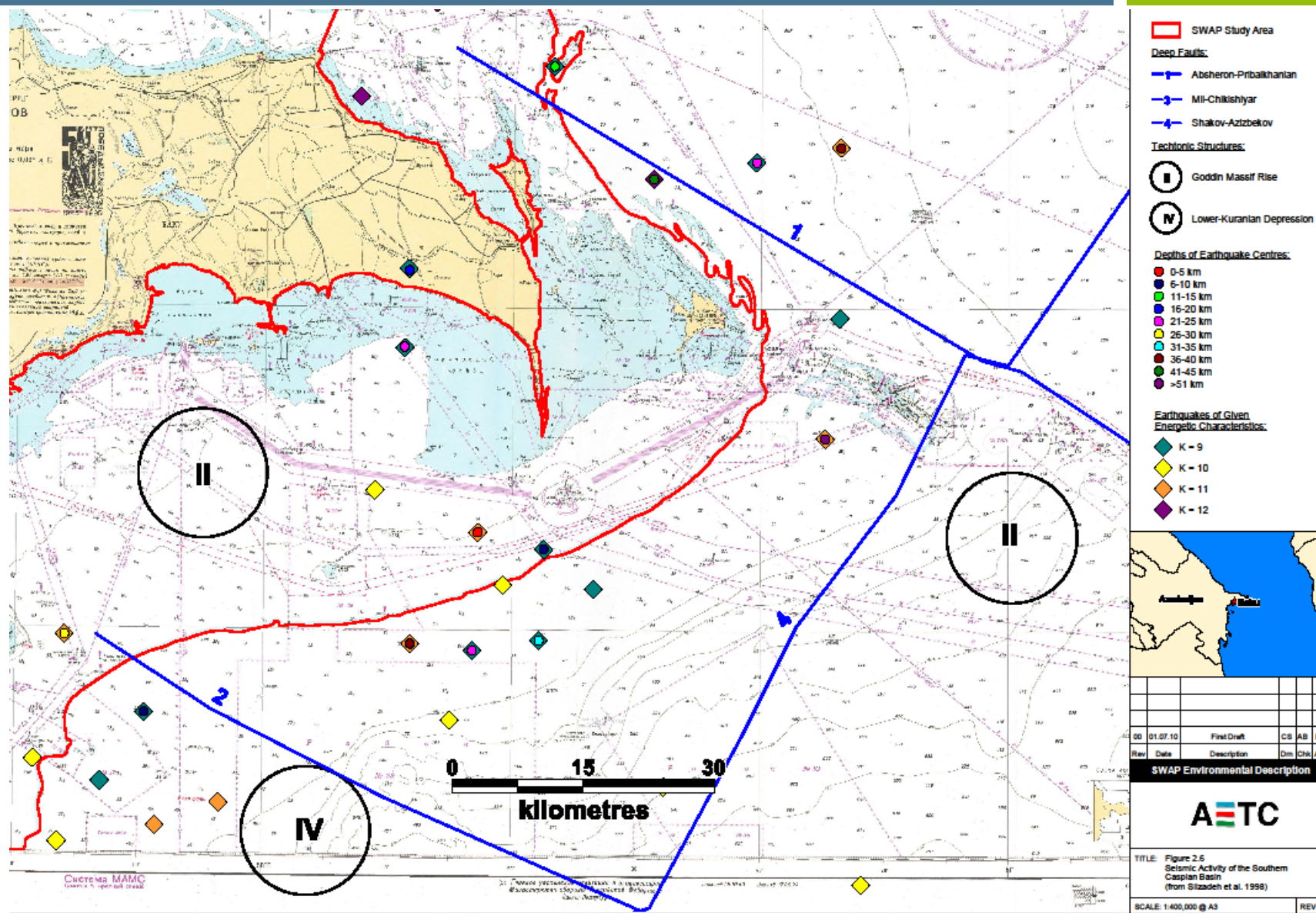
# Topography and ground stability





# Seismicity

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# Mud volcanoes



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# Unstable ground



- The environment can affect the pipeline and construction – as well as *visa versa*



# Data sources and evaluation



## Sources

- Secondary data – literature; web; stakeholders
- Primary data - field surveys (local knowledge is invaluable)
  - Environmental
  - Social

## Evaluation

- Receptor extent
- Receptor sensitivity / value
- Receptor context (similar nearby?)



# Defining the baseline – points to watch



## Secondary data

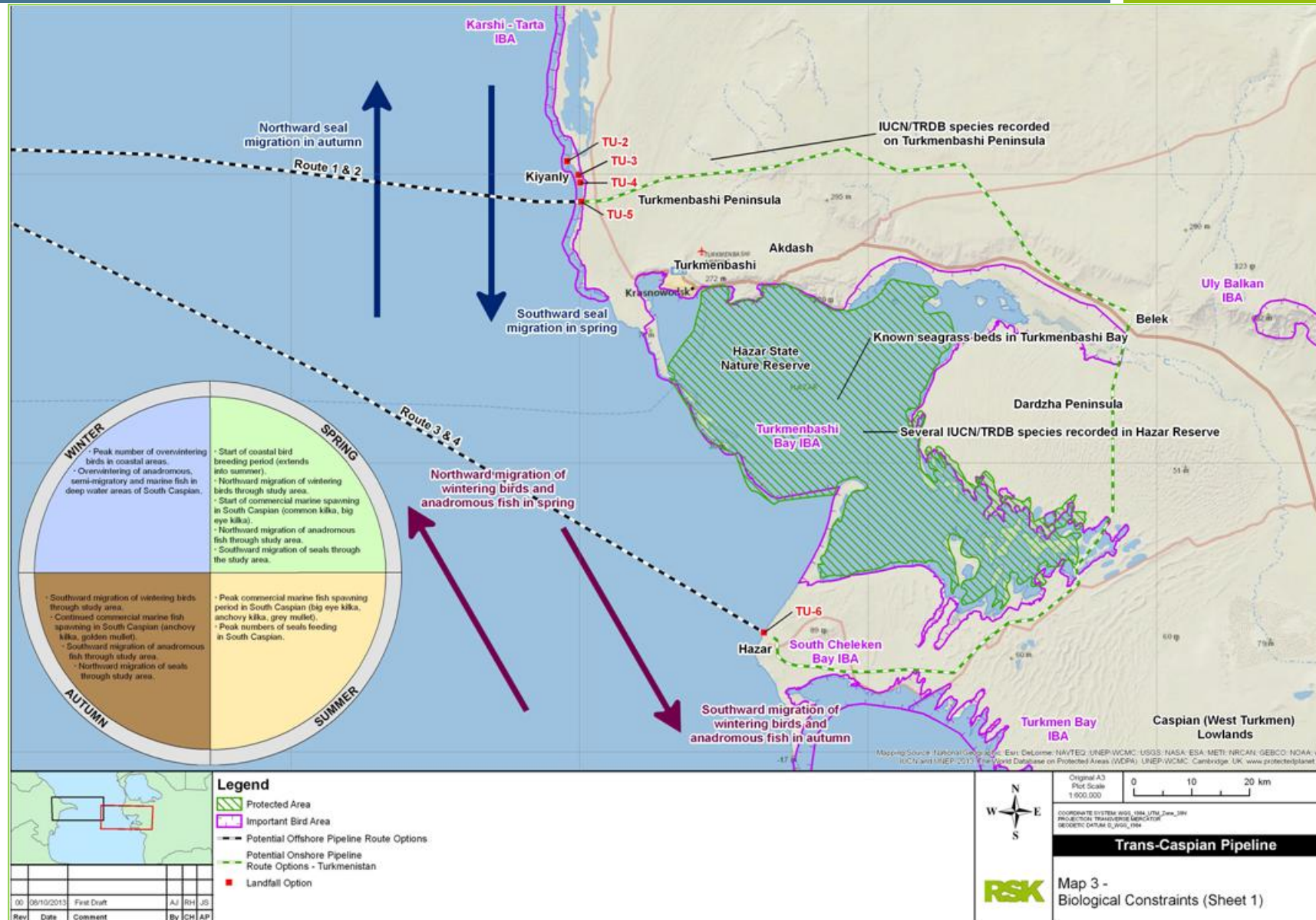
- Validity (age; location; relevance)
- Accuracy

## Primary data

- Agree range of surveys and methodology with relevant stakeholders
- Schedule time for field study and reporting
- Access arrangements
- Seasonality
- Logistics arrangements
- Journey management planning
- Health & safety field survey plan



# Baseline mapping





# EIA report content



National legislation prescribes content, but typically requires description and analysis of:

- Why the pipeline is required
- The proposed works – route, land take, construction methods, operational requirements
- Alternatives considered
- Applicable legislation
- Baseline environment, social (and health) conditions
- Potential impacts (including cumulative and transboundary impacts)
- Proposed mitigation measures
- Monitoring and implementation plans
- Non-technical summary

# Impact Assessment Methodology

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# Definitions









Impact	The effect an activity may have on a receptor
Mitigation measure	An action that is proposed to reduce a negative impact
Enhancement measure	An action that is proposed to boost a positive impact
Residual impact	The effect that remains after application of the identified mitigation and enhancement measures



# Impact assessment process



- 
- Define sensitivity of each receptor to change
- 
- For each activity, identify potential impacts and benefits
- 
- Identify potential consequences of each impact
- 
- Determine magnitude of each consequence
- 
- Evaluate probability of each consequence
- 
- Determine significance of impact

## Example: Water resources in UK

### High

- Designated areas, e.g.: Special Protection Areas, Ramsar sites or SSSIs where water quality/hydrology is key to the designation; and Zone I Source Protection Zones
- Salmonid rivers
- Rivers with a Grade A water classification
- Commercial fisheries
- Areas of flood risk
- Areas of known/confirmed contaminated groundwater
- Major aquifers
- Areas of high groundwater vulnerability

### Medium

- Zone II and III Source Protection Zones
- Rivers used for recreational fishing or other recreational use
- Rivers with a Grade B water classification
- Minor aquifers
- Areas with intermediate groundwater vulnerability

### Low

- Rivers with a Grade C or D water classification
- Non-aquifers
- Areas with low groundwater vulnerability

# Determining magnitude of each consequence



## Large

- Change is likely to cause a direct adverse permanent or long term (more than 10 years) impact on the integrity/value of the receptor
- Class 1 Pollution Incident
- Permanent breach of water quality standards

## Moderate

- Change is likely to impact adversely the integrity/value of the receptor but recovery is predicted in the medium term (5-10 years) and there is predicted to be no permanent impact on its integrity
- Class 2 Pollution Incident
- Temporary breach of water quality standards with impacts on other users of that resource

## Small

- Change is likely to adversely impact the integrity/value of the receptor but recovery is expected in the short term (0-4 years)
- Class 3 Pollution Incident
- Temporary breach of water quality standards without significant impacts on other users of that resource

## Negligible

- No effect detectable

May require modelling  
e.g. for emissions to air or water



# Determining significance



		Sensitivity		
		High	Medium	Low
Magnitude	Large adverse	High significance	Moderate significance	Moderate significance
	Moderate adverse	Moderate significance	Moderate significance	Low significance
	Small adverse	Moderate significance	Low significance	Not significant
	Beneficial	Beneficial	Beneficial	Beneficial

# Determining probability (likelihood)



## Define terms, e.g.

- Will not happen i.e. 0% probability
- Unlikely 1-24% probability
- Likely 25 - 75%
- Near certain 75-99%
- Certain 100%

## Outcome

- e.g. Likely to have a moderately significant adverse impact

# Residual impacts



*Residual impact* – the effects that remain after application of the identified mitigation measures

- Not significant
  - no further action required
- Low significance
  - probably does not require further action
- Moderate significance
  - can impact be reduced further?
  - if not, compensation or offset mitigation may be required
- High significance
  - generally unacceptable
  - in exceptional circumstances, may be accepted, but compensation or offset mitigation will be required



# EIA Legislation, Guidelines and Requirements

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# EIA legislation



- Each country has its own legislation - similar requirements, but check details carefully as there are some differences
- In Europe, the EIA Directive sets framework for each member state
  - Directive 2011/92/EU on the Assessment of the Effect of Certain Public & Private Projects on the Environment (as amended by Directive 2014/52/EU)
- In the UK
  - Planning Act 2008: The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended)
  - Gas Act 1986 (as amended): Public Gas Transporter Pipe-Line Works (Environmental Impact Assessment) Regulations 1999 (as amended)
  - Pipelines Act 1962: Pipe-line Works (Environmental Impact Assessment) Regulations 2000 (as amended)

# Lender's EIA requirements



- International Finance Institutions (IFIs or 'Lenders') have stringent EIA requirements
- All require compliance with national legislation and standards
- All have **additional requirements** that must be met before money can be borrowed for a project.

## Examples of IFIs

- EIB – European Investment Bank
- EBRD – European Bank for Reconstruction and Development
- IFC - International Finance Corporation (World Bank)
- IDB - Inter-American Development Bank
- ADB - Asian Development Bank
- Credit export agencies
- etc.



# Specific lender requirements



## **IFC (World Bank Group)**

- Equator Principles
- IFC Performance Standards and Guidance Notes (2012)
- IFC EHS Guidelines - General and Industry-Specific

## **EBRD**

- European Principles for the Environment
- EBRD Environmental and Social Policy (2014)
- EBRD Performance Requirements

## **EIB**

- European Principles for the Environment
- EIB Statement of Environmental and Social Principles and Standards (2009)
- EIB Environmental and Social Handbook (2014)

# Equator Principles



Most IFIs are have signed up to the Equator Principles:

1. Review and Categorisation (Category A,B or C - determines level of assessment required)
2. Social and Environmental Assessment
3. Applicable social and environmental standards
4. Action Plan and Management System
5. Consultation and disclosure
6. Grievance mechanism
7. Independent review
8. Covenants
9. Independent monitoring and reporting
10. EPFI reporting

# European Principles for the Environment (EPE)



## **Adopted by the 5 European multilateral financing institutions**

- the Council of Europe Development Bank
- the European Bank for Reconstruction and Development
- the European Investment Bank
- the Nordic Environment Finance Corporation
- the Nordic Investment Bank

## **The EPE are defined as:**

- the guiding environmental principles in the EC Treaty; and
- the practices and standards incorporated in EU environmental legislation

## **The EPE include, in particular:**

- the precautionary principle
- the prevention principle
- the principle that environmental damage should as a priority be rectified at source
- the polluter pays principle



# IFC Performance Standards and Guidance



- National legislation and standards apply
- IFC Performance Standards and Guidance Notes
  - Social and environmental assessment and management system
  - Labour and working conditions
  - Pollution prevention and abatement
  - Community health, safety and security
  - Land acquisition and involuntary resettlement
  - Biodiversity, conservation and sustainable natural resource management
  - Indigenous peoples
  - Cultural heritage
- IFC EHS Guidelines
  - General EHSG
  - Industry-specific , particularly ‘EHSG for onshore oil and gas developments’

**EBRD and EIB have similar performance requirements**

# Managing Commitments

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# Understanding the commitments



## Contractor's Perspective

- Limited timescale to tender
- Large volume of information
  - Availability of resources to review?
  - Legal status of ESIA?
  - What is important?
  - Who is responsible for which commitments?
  - What has cost implications?



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## External Stakeholders' Perspective

- How will our interests be affected?
- Who is responsible for implementation?
- How will the commitments be implemented?
- Who is monitoring delivery – and how?
- What redress do we have if things go wrong?





# Managing commitments



## Good Industry Practice (e.g. BTC pipeline)

- ESIA – mitigations summarised in tables
- Developed into Commitments Register
- Implemented through Environmental and Social Management Plans
- Monitored through audits
- Close-out tracked
- Widespread consultation
- Community liaison teams
- **Transparency and accountability**

## Commitments Register

- Summarise all commitments:
  - ESIA & Addenda
  - Public Consultation and Disclosure Plan
  - Resettlement Action Plan
  - Host Government Agreement
  - Contract
- Identify responsible party for each commitment
- Assign each commitment to a named Management Plan
- Forms basis for ESMP

# Environmental & Social Management Plans - examples



## Client and Contractor

- Community Safety
- Community Liaison
- Construction Camp Management
- Infrastructure and Services
- Employment and Training
- Procurement and Supply
- Transport Management
- Cultural Heritage
- Reinstatement
- Pollution Prevention
- Waste Management
- Emergency Response

## Client

- Public Consultation & Disclosure Plan
- Resettlement Action Plan
- Oil Spill Response Plan
- Community Investment Programme
- Environmental Investment Programme





# Environmental and Social Action Plan



- Requirement for major projects under IFC and EBRD Guidelines
- Forms environmental and social contract between lenders and proponent
- Is document against which the project is audited by Independent Environmental Consultant
- Provides bridge between ESIA and construction
- Details project standards
- Sets framework for delivery and monitoring
- Outlines transition between construction and operation

# Auditing and monitoring



# Q & A

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# ESIA Schedule – Practical session

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# Practical session on scheduling



- Separate groups for different scenarios
- Use handouts to draft schedule
- Feedback and discussion at end



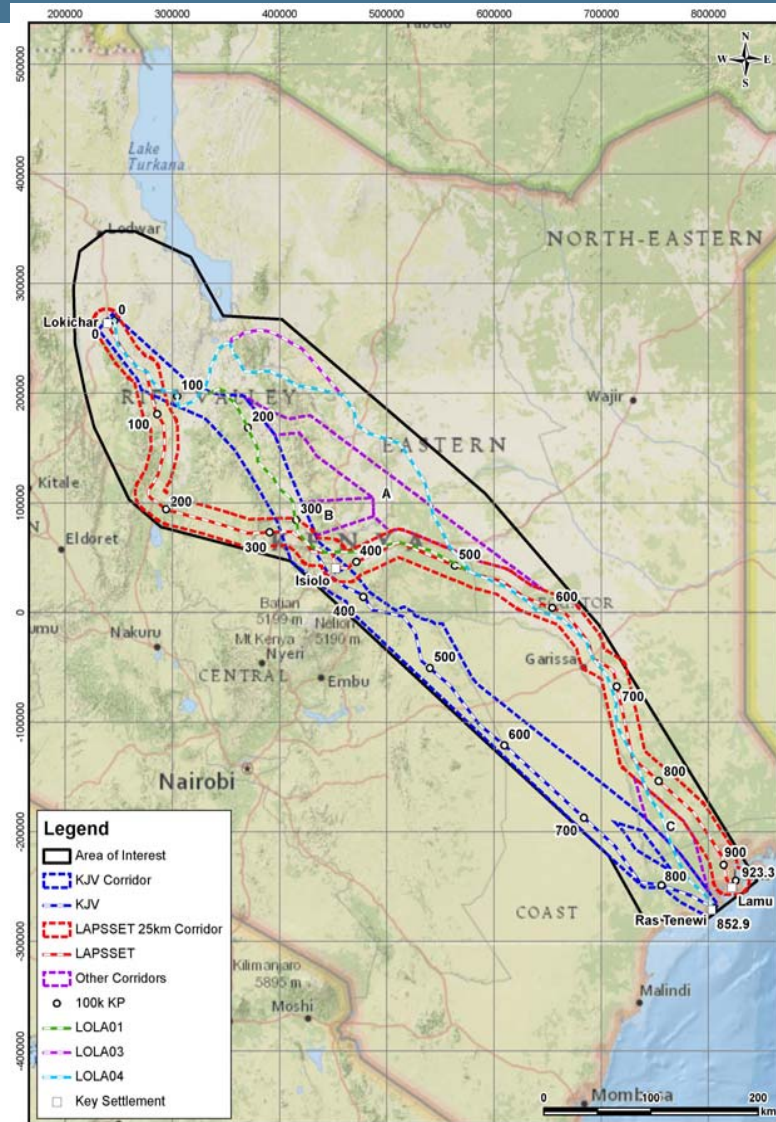
# Route corridor selection



- Example of a 900-km crude oil pipeline
- two primary focus corridors and three additional corridors
- political factors
- economic factors : private and government sector roles in selecting routes
- can last over two years!



# Corridor routes



- Pipeline design and EIA are iterative processes
- Good communication and co-operation between environmental and engineering teams throughout design is **ESSENTIAL**
  - Engineers need to be kept up to date with new environmental / social information
  - EIA team need to know of changes to engineering design
  - Both teams need to agree proposed mitigation measures
  - Share information including GIS layers
  - Regular meetings/workshops
- Timing can be an issue