PHASE I ENVIRONMENTAL DUE DILIGENCE WITH CONCEPTUAL SITE MODEL

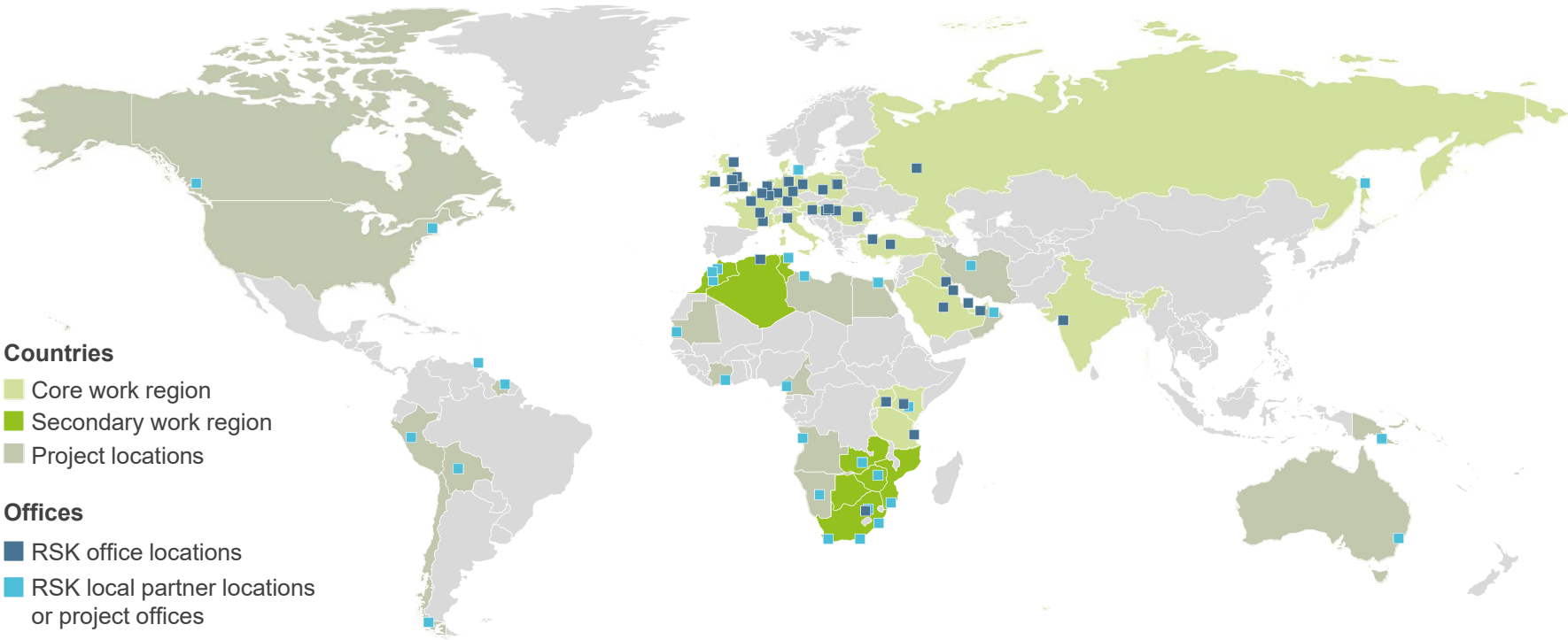
CONFERENCE, ISTANBUL

November 2018

The leading UK privately owned environmental consultancy

2,800 staff	**54** businesses operating through **6** divisions	
100 locations	Over **7,000** clients	**9%** compound organic growth since 2011

Working in diverse regions



Oil refining, depots, terminals and retail

Oil refining, depots, terminals and retail

Investigating fuel spills at refineries, depots and filling stations across Europe for all the major oil companies. Implementing clean up solutions in response to major spills using a variety of in-situ and ex-situ techniques.

Upstream oil, gas and pipelines

Working on the world's largest oilfields
assisting with exploration and production

Nuclear power, renewables, transmission and distribution

Nuclear power, renewables, transmission and distribution

Undertaking the site investigations at Wylva, Hinkley and Bradwell – the biggest and most complex site investigation projects in Europe

Nuclear power, renewables, transmission and distribution

Nuclear power, renewables, transmission and distribution

Largest provider of 24/7, 365 incident response
Hazardous waste management
Integrity testing of power line towers and masts
Flood impact sanitisation
Environmental impact assessment
Ecological surveys and mitigation
Ground investigation

Residential Property

Growth sector

Go-to consultant for multi-disciplinary management of complex sites

One-stop-shop from appraisal to regulatory approval support

Brownfield regeneration specialists, including asbestos impact

PEEL

Harworth

GLADMAN

Commercial Property

Strength through organic growth and acquisitions

‘Critical friend’ support for most of the top 10 tier-1 contractors

In-house engineering design, refurbishment and change of use through **KMG**, **M&S**, **Acies**, **CWA** and **Building Sciences**

Rail

Major infrastructure projects – surveys, consenting services, environmental management and monitoring, and specialist contracting

Road

Highways England – £15 billion to renew and improve the strategic highway network. Projects include Mersey Gateway, A303 Stonehenge Tunnel and Lower Thames crossing.

Airports

Growth sector – EIA, environmental management and monitoring, sustainability strategy development and masterplan delivery for UK and overseas airports

Heathrow YOUR LONDON AIRPORT Gatwick مطارات أبوظبي ABU DHABI AIRPORTS U.S. AIR FORCE Al Rajhi Airports Saudi Oger Ltd TAV

The RSK Turkey certificates

T.C.
ÇEVRE ve ŞEHİRCİLİK BAKANLIĞI
Çevresel Etki Değerlendirmesi, İzin ve Denetim Genel Müdürlüğü

ÇEVRE DANIŞMANLIK YETERLİK BELGESİ

Belge No : ÇDYB - 9651
Firma Adı : RSK ÇEVRE HİZMETLERİA.Ş.
Adresi : GOP REŞİT GALİP CAD 74 5 ÇANKAYA
Onay Tarihi : 23.09.2016
Geçerlilik Tarihi : 23.09.2020

Çevre Görevlisi, Çevre Yönetim Birimi ve Çevre Danışmanlık Firmaları Hakkında Yönetmelik kapsamında çevre yönetim hizmeti vermeye yetkilidir.

M.Mustafa SATILMIŞ
Bakan a.
Genel Müdür

Bu belge 5070 sayılı elektronik imza kanununa göre güvenli elektronik imza ile imzalanmıştır.

T.C.
ÇEVRE ve ŞEHİRCİLİK BAKANLIĞI
Çevresel Etki Değerlendirmesi, İzin ve Denetim Genel Müdürlüğü

TOPRAK KİRLİLİĞİNİN KONTROLÜ VE NOKTASAL KAYNAKLI KİRLENMİŞ SAHALARA DAİR
YETERLİLİK BELGESİ

Bu belge, 17.06.2011 tarih ve 27967 sayılı Resmi Gazetede yayımlanan "Toprak Kirliliğinin Kontrolü ve Noktasal Kaynaklı Kirlenmiş Sahalara Dair Yönetmelik Yeterlilik Belgesi Tebliği" uyarınca **"RSK ÇEVRE HİZMETLERİ ANONİM ŞİRKETİ"**ne toprak kirliliği oluşan sahalarda gerekli raporları hazırlamak ve faaliyetleri yürütmek üzere verilmiştir.

M. Mustafa SATILMIŞ
Bakan a.
Genel Müdür

Belge No : **22**
Geçerlilik Süresi : 31/07/2017 – 31/07/2022
Kuruluş Adresi : Cinnah Cad. 41/12 Çankaya / ANKARA
Bu belge verildiği tarihten itibaren 5 (beş) yıl süre ile geçerlidir.

The RSK Turkey staff certificates

T.C.
ÇEVRE ve ŞEHİRCİLİK BAKANLIĞI
Çevresel Etki Değerlendirmesi, İzin ve Denetim Genel Müdürlüğü

ÇEVRE GÖREVLİSİ BELGESİ

Belge No	: ÇGB - 28108
T.C. Kimlik No	: 19024855824
Adı ve Soyadı	: GÖKBERK KARA
Onay Tarihi	: 21.12.2015
Geçerlilik Tarihi	: 21.12.2019

Çevre Görevlisi, Çevre Yönetim Birimi ve Çevre Danışmanlık Firmaları Hakkında Yönetmelik kapsamında çevre yönetim hizmeti vermeye yetkilidir.

M.Mustafa SATILMIŞ
Bakan a.
Genel Müdür

Bu belge 5070 sayılı elektronik imza kanununa göre güvenli elektronik imza ile imzalanmıştır.

T.C.
ÇEVRE ve ŞEHİRCİLİK BAKANLIĞI
Çevresel Etki Değerlendirmesi, İzin ve Denetim Genel Müdürlüğü

ÇEVRE GÖREVLİSİ BELGESİ

Belge No	: ÇGB - 30191
T.C. Kimlik No	: 59326410796
Adı ve Soyadı	: ÖZKAN ERDEM
Onay Tarihi	: 04.03.2016
Geçerlilik Tarihi	: 04.03.2020

Çevre Görevlisi, Çevre Yönetim Birimi ve Çevre Danışmanlık Firmaları Hakkında Yönetmelik kapsamında çevre yönetim hizmeti vermeye yetkilidir.

M.Mustafa SATILMIŞ
Bakan a.
Genel Müdür

Bu belge 5070 sayılı elektronik imza kanununa göre güvenli elektronik imza ile imzalanmıştır.

T.C.
ÇEVRE ve ŞEHİRCİLİK BAKANLIĞI
Çevresel Etki Değerlendirmesi, İzin ve Denetim Genel Müdürlüğü

ÇEVRE GÖREVLİSİ BELGESİ

Belge No	: ÇGB - 31740
T.C. Kimlik No	: 57655028750
Adı ve Soyadı	: SEÇKİN TÜRKCAN
Onay Tarihi	: 01.06.2016
Geçerlilik Tarihi	: 01.06.2020

Çevre Görevlisi, Çevre Yönetim Birimi ve Çevre Danışmanlık Firmaları Hakkında Yönetmelik kapsamında çevre yönetim hizmeti vermeye yetkilidir.

M.Mustafa SATILMIŞ
Bakan a.
Genel Müdür

Bu belge 5070 sayılı elektronik imza kanununa göre güvenli elektronik imza ile imzalanmıştır.

What RSK do for Clients?

THE UK'S LARGEST PRIVATELY OWNED MULTI-DISCIPLINARY ENVIRONMENTAL CONSULTANCY

- Due Diligence
- Site investigation (Phase II ESA, delineation of contamination)
- Remediation/Brownfield development and contaminated land
- Permitting
- Laboratory testing
- Asbestos management
- Corporate environmental management
- Health and safety
- Environmental impact and design
- Geohazards
- Asset Data Management
- Aerial survey, geomatics & linear asset software solutions
- Carbon management
- Renewable energy consultancy and installation
- Communications, marketing and stakeholder engagement
- Geophysics
- Geotechnics
- Japanese Knotweed solutions
- Legionella management
- Materials and structures
- Nuclear services
- Software/web/IT development & outsourcing
- Building envelope design, construction and testing
- Training
- Water

Which Site is more Contaminated?

Contaminated Land

1.

- **Types of Client affected by Contaminated Land:**
  - **Developers**
  - **Contractors**
  - **Site Neighbours**
  - **Banks**
  - **Receivers/Administrators**
  - **Property investors**

- **Contaminated Land Regulation**

- **Contaminated Land Assessment – Risk Based Approach**

- **Ministry of Environment/local Directorates**
  - **Preliminary Risk Assessment;**
  - **Generic Quantitative Risk Assessment;**
  - **Detailed Quantitative Risk Assessment;**
  - **Remedial Strategy;**
  - **Verification.**

Contaminated Land

1.

- **How does Contaminated Land affect the identified stakeholders:**
  - Impacts the value of a property;
  - Delays construction projects;
  - Exposes a developer to financial penalties through claims from a contractor;
  - Impacts on the sale of a property;
  - Feasibility of project;
  - Reputation.

- **What questions should clients be asking?**
  - Requesting all environmental information pertinent to the site;
  - Have the information peer reviewed;
  - Challenge tender information;
  - Pass on appropriate information;
  - If necessary engage the right consultants.
  - Be cautious of non-disclosure

Phase I EDD scoping

"The Phase I Environmental Due Diligence will comprise a desk study review of historical and regulatory information (available), informal consultation of key environmental regulators (confidentiality permitting) and a walk over survey"

The scope of works for the Assessment contains the following elements:

- *Preliminary analysis of existing documentation of the herein site with review of available site specific environmental information (provided by the client and/or site representatives);*
- *Site visit of the site, walkover survey and interviews with key staff (where feasible);*
- *Inspection of the neighboring areas;*
- *Informal enquiries with relevant environmental regulatory bodies (confidentiality permitting);*
- *Site history of the historical land uses on and surrounding the site from publicly available sources;*
- *Assessment of the 'sensitivity' of the site location as determined by factors such as hydrogeology, proximity of watercourses, neighbouring land use, etc.;*
- *Analysis of the significance of all potential environmental risks identified in the context of the proposed site use;*
- *Wetlands and flooding areas (based on available documents and authorities information);*
- *Identification of mining activities in the area;*
- *Presentation of findings in a non-technical executive summary, with conclusions and recommendations (if appropriate);*
- *Identification of any existing protected areas/objects on the site;*
- *Soil and groundwater conditions analysis including contamination analysis based on existing Reports and available public sources;*
- *Environmental documentation check according to local legislation requirements in accordance with the Local Land Use Plan (LLUP);*
- *Environmental Risk assessment with special focus on soil and groundwater contamination (Conceptual Site Model);*
- *Summary and recommendations;*

Phase I EDD scoping

The Phase I EDD Report will include the following aspects:

- *Site Details (Current site description and use, Site location plans);*
- *Overview of the Site Reconnaissance;*
- *Historical Land Use Map Info and historic and current photographs;*
- *An analysis of regulatory and statutory requirements;*
- *Planning;*
- *Air Emission Issues;*
- *Flooding Data;*
- *Bulk Hazardous Materials Storage;*
- *Polychlorinated Biphenyls (PCBs);*
- *Waste Management;*
- *Coal mining certificates – if available;*
- *Overview of Mining Activities - if necessary; available;*
- *Potential soil and groundwater contamination;*
- *The findings of the site inspection, where undertaken;*
- *Surrounding land use including nature protected areas;*
- *Regulatory Consultation and review of the local authority documentation;*
- *Geological, hydrogeological and hydrological setting;*
- *Environmental summary/site setting;*
- *Noise Issues;*
- *Wetlands;*
- *Other Hazardous Materials;*
- *Ozone Depleting Substances (ODS);*
- *Radon certificates – if available;*
- *Preliminary research on Asbestos Containing Materials (ACMs) - based on available documents;*
- *Summary of third party documentation (reports) – if*
- *Discussion of soil and groundwater results;*

- *Pollution linkages between contaminant sources, pathways and receptors;*
- *Environmental risk appraisal (risk rating analysis and the assessment of risk and liabilities);*
- *A schedule of documents and a list of all documents reviewed as part of the data room and site;*
- *Conclusions and Recommendations.*

Phase I EDD scoping

The scope of works within Phase I Environmental Due Diligence includes the following steps:

- *Data Room – RSK Consultant assist the Vendor/Buyer to provide a co-ordinated list of the information required from the site owner for the due diligence process. Once provided, verify that such environmental information has been provided.*
- *Site visit*
- *Reporting*

The results of the Phase I Assessment are presented in the form of an environmental risk appraisal report detailing the potential environmental risks and liabilities associated with the site. The report aims to identify and quantify all environmental issues which could have a significant impact on the transaction, with particular attention to soil and groundwater contamination risk.

Conceptual Site Models (CSM)

What is a Conceptual Model?

*"A **conceptual model** is a **simplified representation** of how the real system is believed to behave, but **without losing relevant detailed data**"*

(http://www.NICOLE.org)

i.e. regional geological cross sections, catchment management diagrams

What is a Conceptual Site Model (CSM)?

*"A **CSM** represents the characteristics of a **site** in diagrammatic or written form, that shows the possible **relationships** between contaminant **sources, pathways** and **receptors**"*

(CLR 11 - Model Procedures for the Management of Land Contamination)

Sources, Pathways and Receptors

- Sources, pathways and receptors are used for evaluating "**risk**", namely:

  "*a combination of the **probability of occurrence** of a **defined hazard**, and the **magnitude of the consequences** of the occurrence*"

  (CLR 11 - Model Procedures for the Management of Land Contamination)

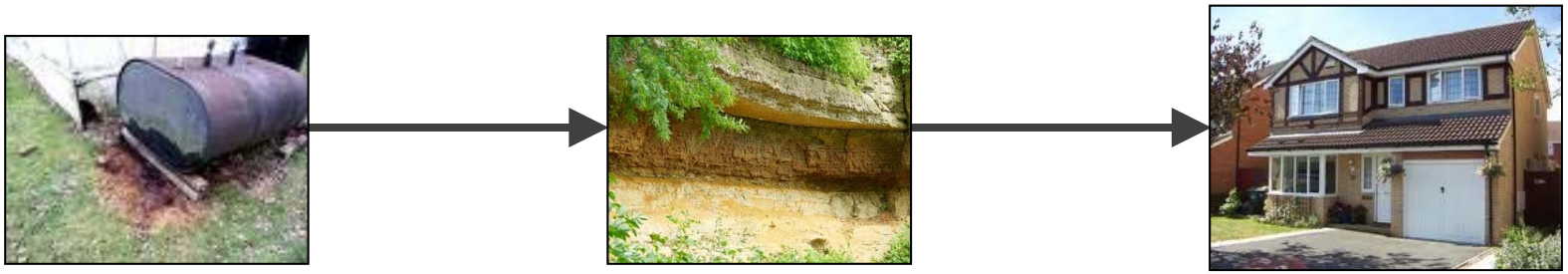
- 3 essential elements to risk…

  Contaminant source - a **substance** that is in, on or under the land and has the potential to cause **harm to health** or to cause **pollution of the environment**…

What is a Pollutant Linkage ?

- A source, pathway or receptor can **exist independently** with out necessarily representing a “risk”

- However, they can represent a **risk** when **all 3** are present **together**:



Source: Domestic heating oil tank leakage

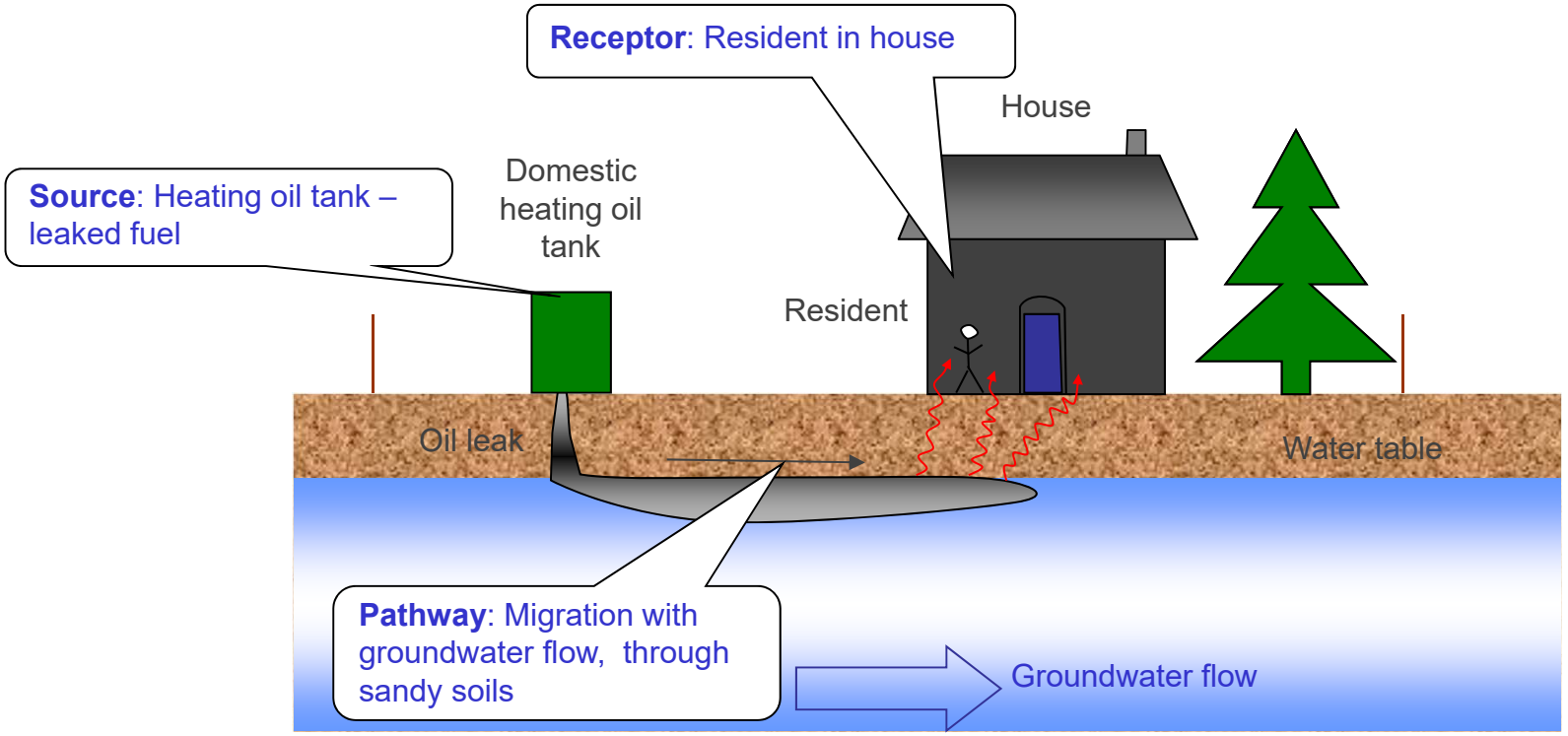
Pathway: Oil seeps into sandy soils, and lands on shallow water table

Receptor(s): Fuel vapours migrate into the house, collect within air and are inhaled by residents

This combination of source, pathway and receptor present together is referred to as a **pollutant linkage**

What is a Pollutant Linkage ?

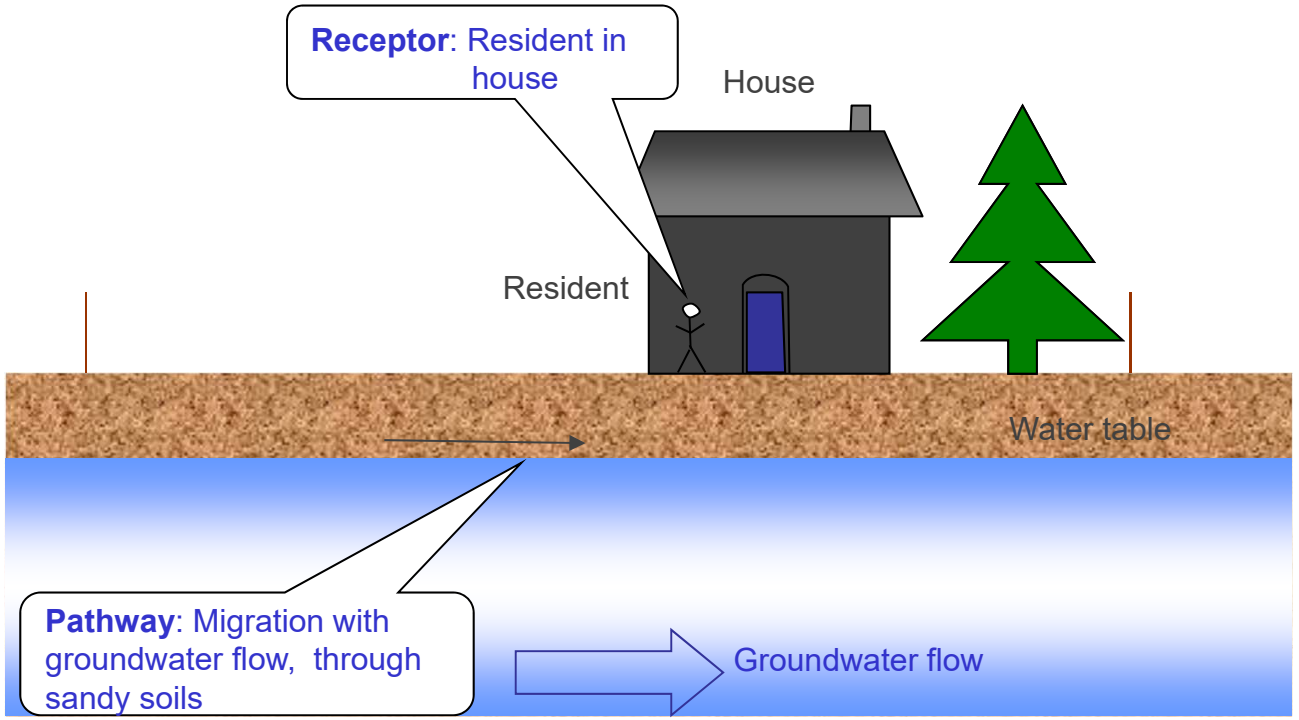
For example:



Source	Pathway	Receptor
Heating oil tank – leaked fuel	Lateral migration through sandy soils, with groundwater flow	Residents inhaling indoor air within the adjacent house

What is a Pollutant Linkage ?

Pollutant linkage cannot exist, if any one aspect is missing…



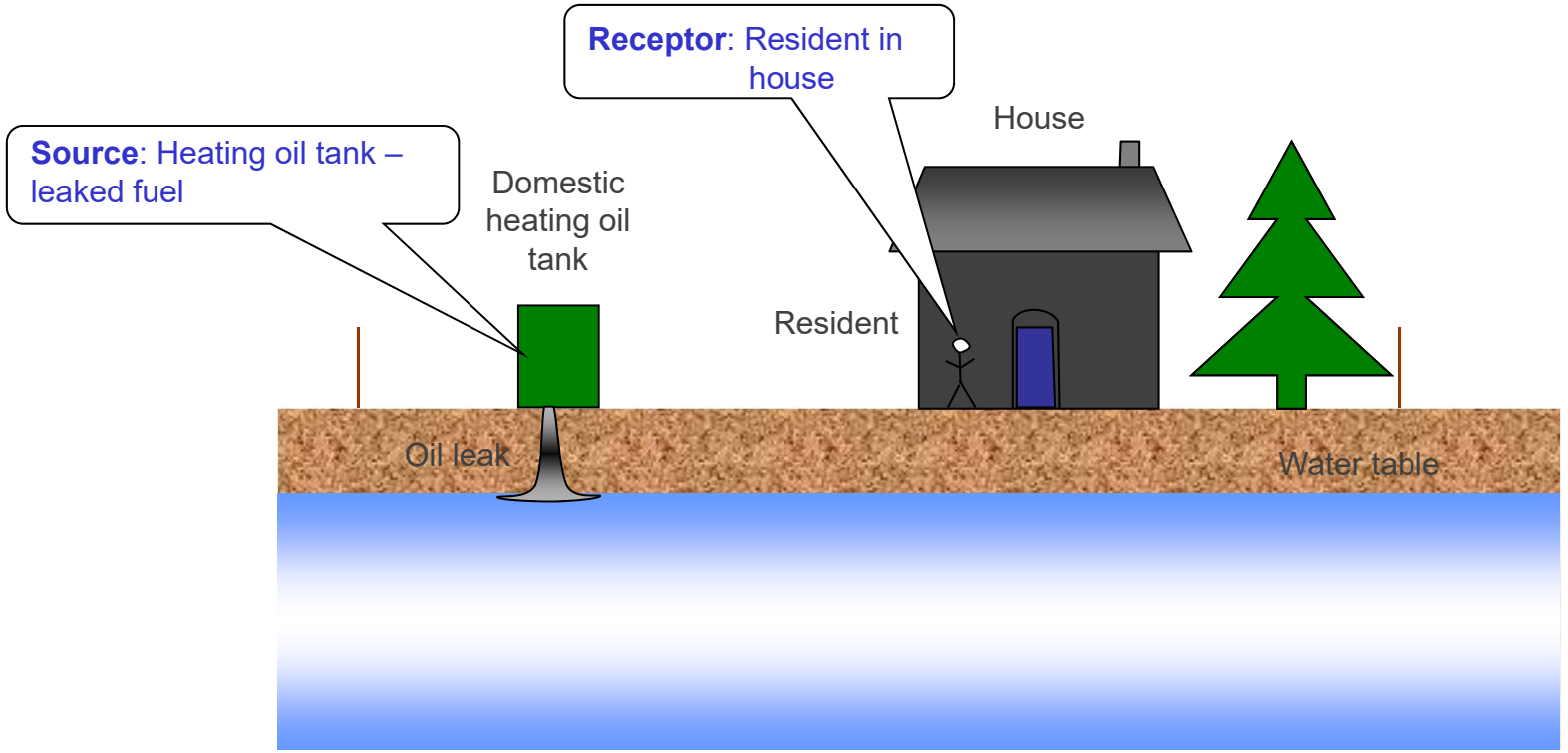
~~Source~~ Pathway → Receptor

Lateral migration through sandy soils, with groundwater flow

Residents inhaling indoor air within the adjacent house

What is a Pollutant Linkage ?

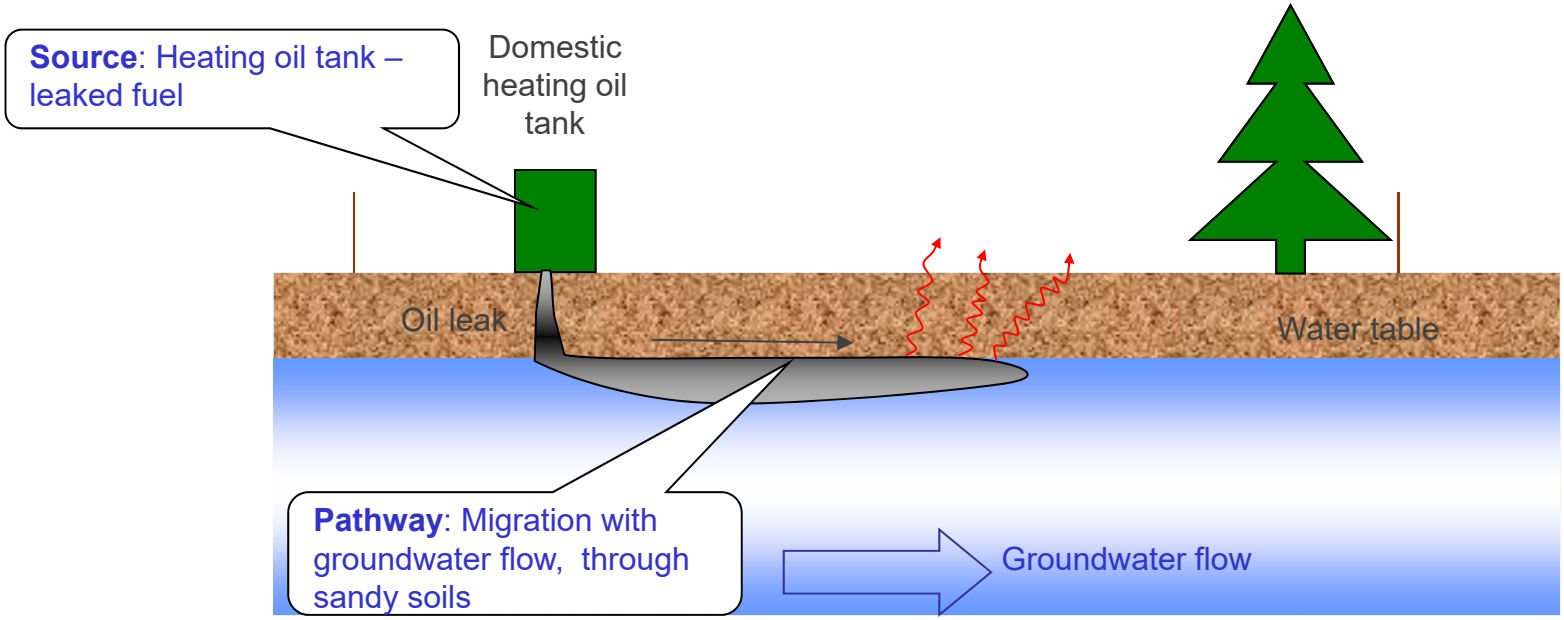
Pollutant linkage cannot exist, if any one aspect is missing…



Source	~~Pathway~~	Receptor
Heating oil tank – leaked fuel		Residents inhaling indoor air within the adjacent house

What is a Pollutant Linkage ?

Pollutant linkage cannot exist, if any one aspect is missing…



Source → Pathway ~~Receptor~~

Heating oil tank – leaked fuel

Lateral migration through sandy soils, with groundwater flow

CSM Sources - Common Examples

•Sources - generally related to historic and current **site activities**

•Not always immediately obvious what land uses could cause contamination

Site use: Petrol filling station

Source(s): Underground fuel storage tanks

Possible Contaminants: Fuel

Site use: Old, unregulated landfill site

Source(s): Buried wastes of unknown origin

Possible Contaminants: Fuels, oils & metals

Site use: Historic gasworks site

Source(s): Tar wells / tanks, gas holders

Possible contaminants: Fuels, oils and tars metals & organic compounds

CSM Pathways - Common Examples

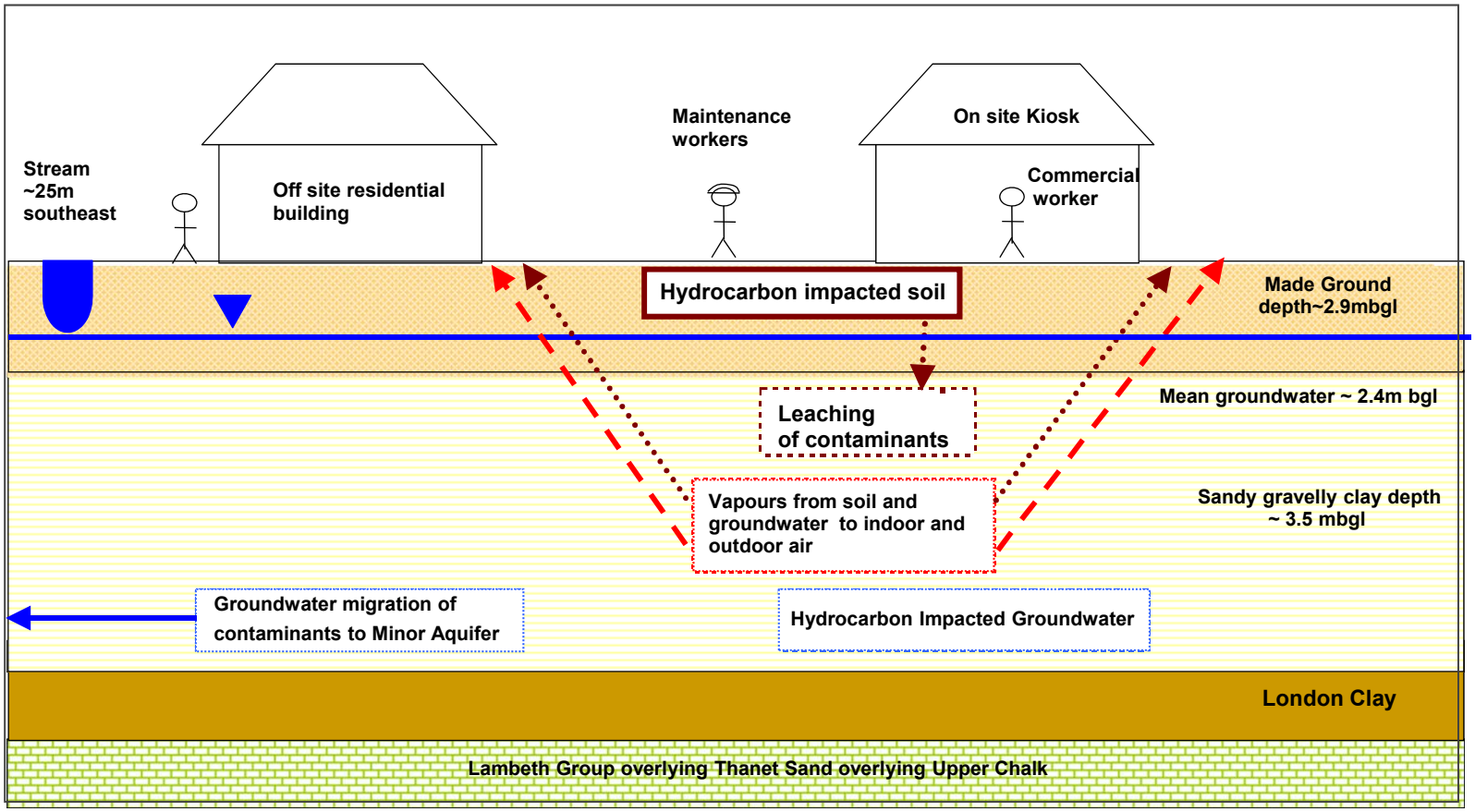
- **Ingestion** of contaminated soil or **inhalation of dust** from contaminated soil
- **Ingestion of vegetables** grown in contaminated soil
- Direct **skin contact** with contaminated soil
- **Inhalation of vapours** arising from contaminated soil & groundwater
- Lateral **migration within groundwater**
- Migration along **preferred flow paths** (i.e. drains, service runs)
- **Drinking** of contaminated groundwater

CSM Receptors - Common Examples

- **Residents** living on a redeveloped housing site
- **River** flowing along side a site boundary
- A public **water supply well**
- **Groundwater** offsite (and its potential future **resource value**)

What format do CSMs take ?

Cross-Section Diagram:



Courtesy of RSK Group Plc.

In Summary : Conceptual Site Models….

1. Show the **characteristics of a site**, usually in diagrammatic form
2. Summarise **source → pathway → receptor** pollutant linkages
3. Contain numerous pieces of **known data**
4. Are important for the **management** and assessment of contaminated land
5. Are also useful for providing a **visual overview** of a site
6. Can **aid with communication** and planning of future work
7. Are **working documents**, routinely updated as more data becomes available

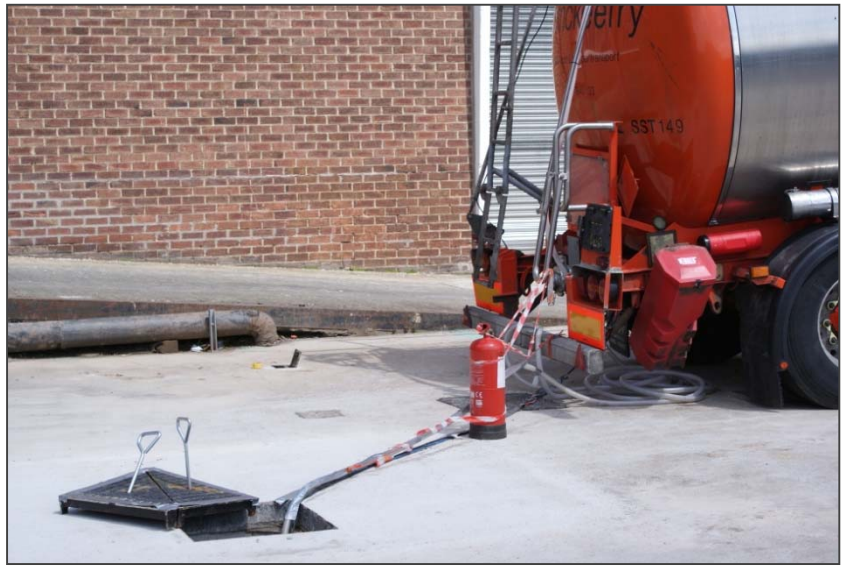
Types of Environmental Liability

1.

- Contaminated Land
- Invasive Plant Species
- Asbestos
- Waste

Former Industrial Site

- Manufacturing Facility -Engineering;
- Site Closed after c. 60 years in production;
- Tenant was existing the site and apart from normal delaps had concerns about environmental impact from site operations;
- RSK engaged to advise client on potential liabilities;
- Tenant engaged their own consultant to carry out contaminated land assessment;
- RSK carried out follow-up works and identified FPP in shallow groundwater;
- Tenant completed remedial works;
- RSK validated works on behalf of landlord;
- Saved client expense and liability;
- Provided client with information regarding the condition of the site for future tenants



Invasive Plant Species

1.

- **Types of Invasive Plant Species:**
  - **Japanese Knotweed;**
  - **Giant Hogweed;**
  - **Himalayan Balsam;**
- **What are the implications of Japanese Knotweed?**
  - **Breaks up pavements;**
  - **Structural damage to buildings**
  - **It is not an offence to have JK growing on your land;**

  However
  - **There is no specific legislative requirement to manage JK in Turkey;**

Asbestos

- What is Asbestos ;
  - Naturally occurring mineral fibre;
  - Mined like coal – Turkey, Cyprus, Canada;
  - Used in >2000 products;

- Regulation:
  - Duty to Manage Asbestos in Non-Domestic Premises;
  - Must undertake assessment of building and survey/risk assessment of asbestos;

Asbestos

- What are the liabilities;
  - Exposure of staff/visitors to asbestos;
  - Exposure of maintenance staff to asbestos;
  - Waste Management;
- Minimising the Liability:
  - Have appropriate surveys in place;
  - Adhere to the recommendations of the available surveys;
  - Request appropriate information;

Waste

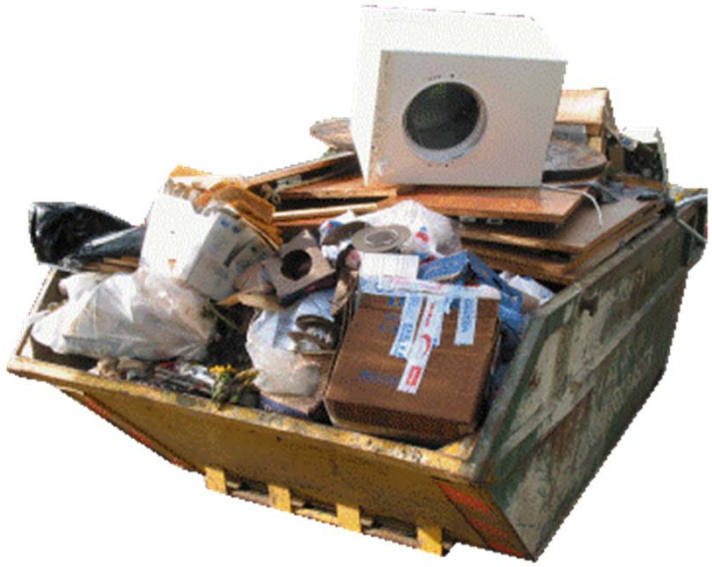
- What are the issues;
  - Illegal Infilling;
  - Historical infilling;
  - Waste Classification;

- Who Does this impact:
  - Developers;
  - Property Investors;
  - Contractors;

Waste

- **What are the liabilities;**
  - **Material disposed in an unlicensed site;**
  - **Material disposed in the wrong authorised site;**
  - **Insufficient waste classification information;**

- **Minimising Liability:**
  - **Ensure waste is appropriately classified;**
  - **Develop a Site Waste Management Plan;**
  - **Ensure the disposal facility is appropriately licensed;**
  - **Ensure that registered hauliers are used;**
  - **Ensure waste transfer process is documented – Duty of Care;**
  - **Retain records and audit process regularly.**



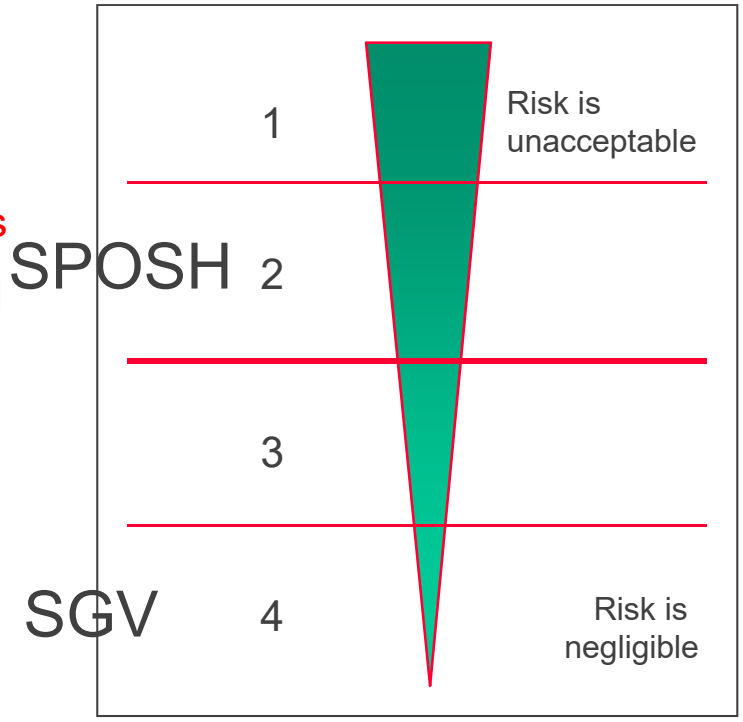
Value Added Approach is based on Advocacy and DQRA

RSK use quantified risk assessment (DQRA) modelling and advocacy to ensure any investment to reduce an environmental impact is based on:

- A real and quantifiable risk; and
- The target set is based on SPOSH rather than a SGV.

Interpretation of Environmental Regulations

- ENVIRONMENTAL REGULATIONS in Europe generally require that an asset or operation is managed such that it is fit for purpose.
- Action is required if there is SIGNIFICANT HARM TO HEALTH being caused or;
- There is a SIGNIFICANT POSSIBILITY of such harm being caused or;
- POLLUTION OF THE ENVIRONMENT is being, or is likely to be caused.
- Regulators generally establish acceptance criteria or screening guidelines as a test of Significance.
- BUT these are necessarily conservative.
- They are NOT a test of Significance of Harm or Poss
- AND Exceedance does not mean that the risk posed



SPOSH - significant possibility of significant harm

SGV - Soil Guideline Value

Any Questions?


RSK