



AN ARGUMENT FOR A GIS CONTAMINATED LAND INVENTORY FOR THE REPUBLIC OF IRELAND

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1 Background

- 2 Extent of CL
- 3 ROI 1999 Inventory
- 4 NI Current Inventory
- 5 Dutch 2009 Inventory
- 6 Comparison
- 7 Why bother?
- 8 Current Practice
- 9 How it can go wrong
- 10 Where do you start?



BACKGROUND

MULROY ENVIRONMENTAL

Who are we?

- Based in Dundalk, County Louth (the Wee County)
- Started in 2007

Services

- Due Diligence Site Investigation/Contaminated Land Risk Assessment
- Remediation/Bioremediation of Contaminated Soil & Water
- Waste Licence & Permit Applications
- IPPC Licensing
- Wastewater Treatment Plant Design for Single, Small Community, Commercial & Industrial Development
- Site Suitability Assessment
- Environmental Impact Assessment
- Sludge Management Expertise
- Environmental Monitoring

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OÉ Gaillimh

EXTENT OF CONTAMINATED LAND IN REP. OF IRELAND

- Have we understated the extent of (potentially) contaminated land in Ireland?
- Was Ireland bypassed by the Industrial Revolution?
- An agrarian economy? Minor mineral deposits



1. 'Contaminated Land' Report of the Parliamentary Office of Science & Technology (1993).

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EXTENT OF CONTAMINATED LAND IN GREAT BRITAIN

- Regular comparison to the birthplace of the Industrial Revolution - Great Britain with >100,000 potential contaminated sites¹



1. 'Contaminated Land' Report of the Parliamentary Office of Science & Technology (1993).

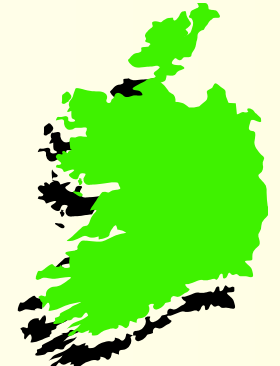
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CONTAMINATED LAND INVENTORY FOR REP. OF IRELAND?

IRISH EPA STUDY 1999

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- Historical Sites
 - Old Gas Works 50-80
 - Closed Landfills 265 (OEE figures?)
 - Closed Mine sites 128 (38 with Tailings Ponds, 11 recent/present high risk)
 - Old Fertiliser Plants 4-6
 - Closed Tanneries 10 -12
- Current Operational Sites
 - Existing Landfills 76 LA 50 Private (Registration ongoing)
 - Mining/Minerals site in operation ca. 7 (MWD)
 - Chemical Industry 150 -160
 - Petroleum import terminals (IPIA) 22
 - Petrol Stations 900 -1200
 - Tanneries 3
 - Dockyards 14-16
 - Military Sites 1
 - Railways Depots 80-100
 - Scrap yards/dismantlers 180 -200
 - Airports with maintenance 2
- Estimated Total of 2,000-2,500 - Ireland's small scale industry? ¹



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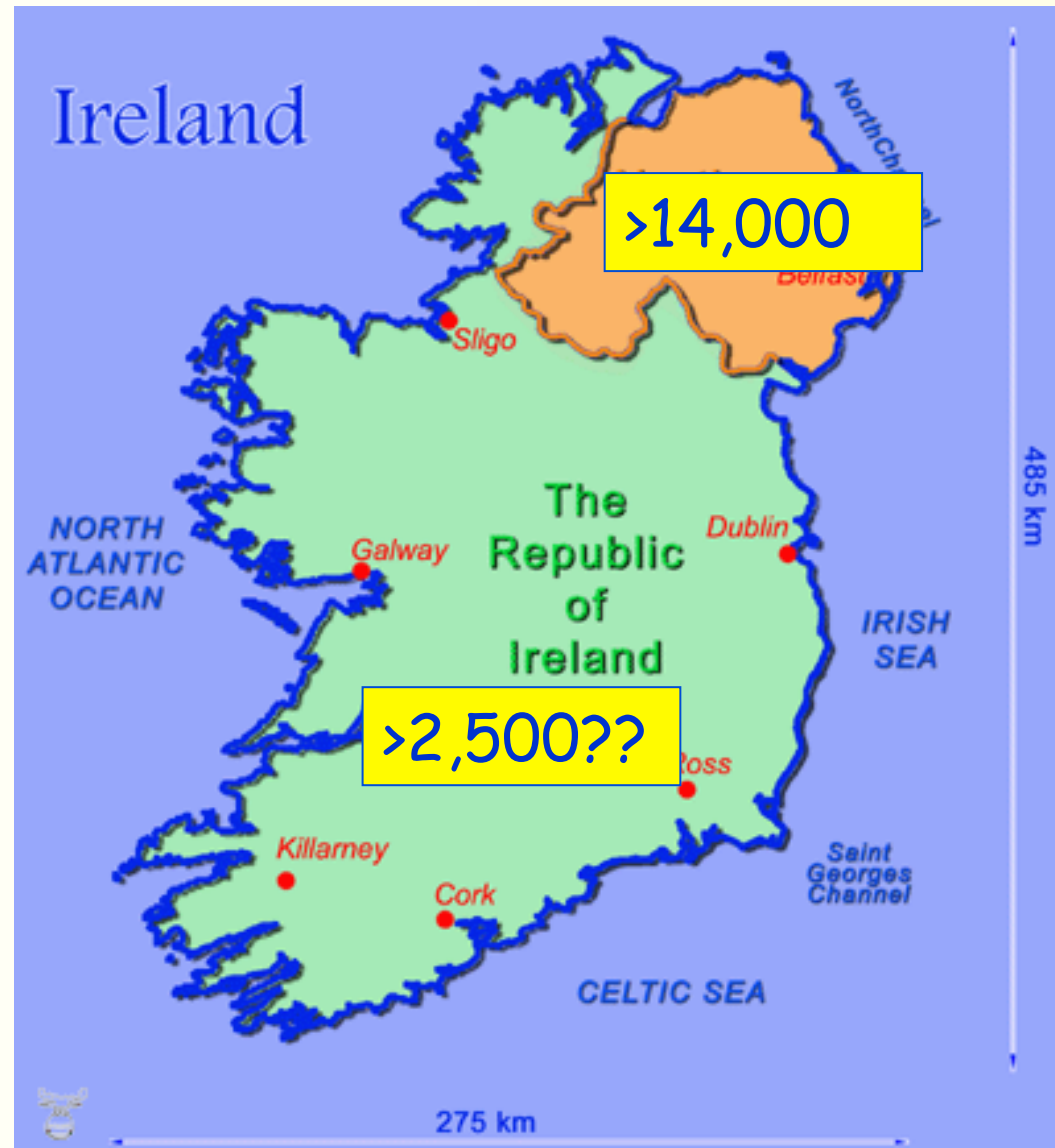
- NI Environment Agency DATABASE

- >14,000 Potentially Contaminated Sites estimated in 2011
- Continual updating - & continuously revised upwards from 11,825 in March 2009
 - High Risk - 8199
 - Medium Risk - 1811
 - Low Risk - 1599
 - Uncategorised - 216
- 30 land use categories



CONTAMINATED LAND INVENTORY FOR REP. OF IRELAND?

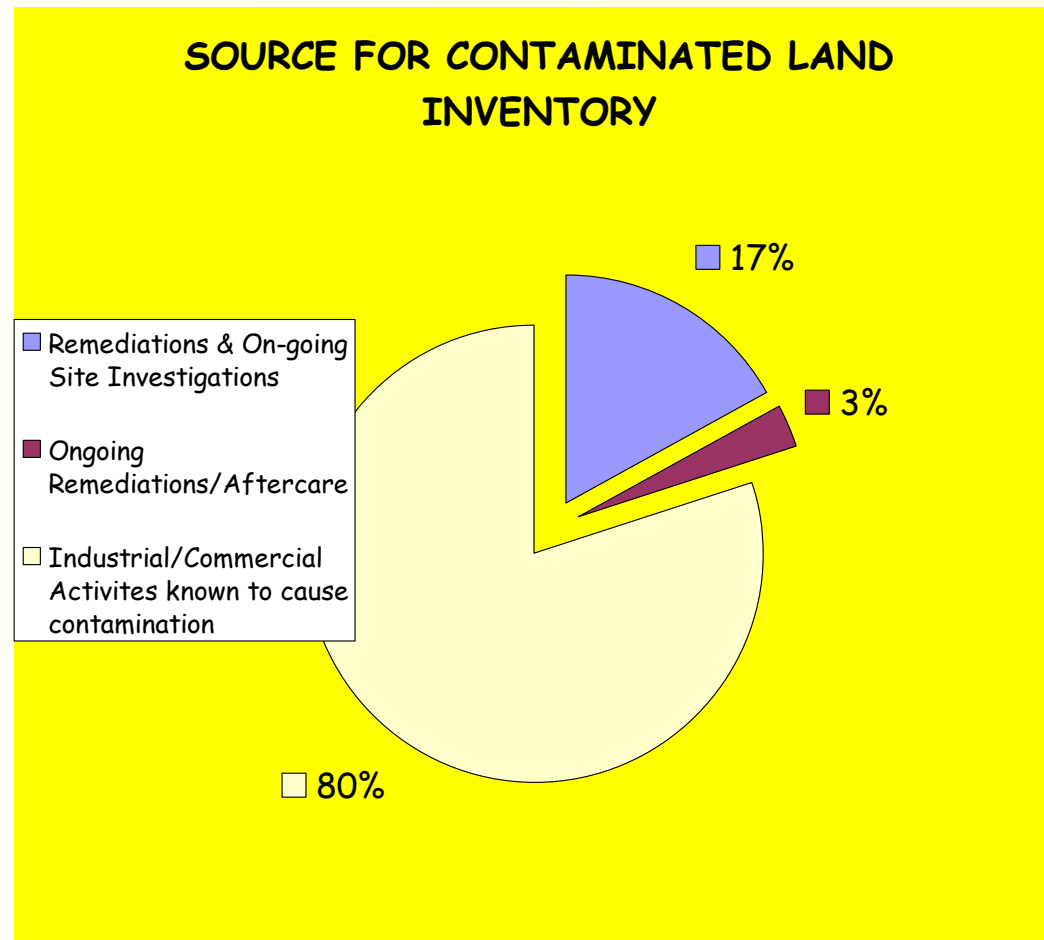
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EXTENT OF CONTAMINATED LAND IN THE NETHERLANDS

- 2004 - National List of Polluted Sites
 - **425,000** Potentially Contaminated Sites.

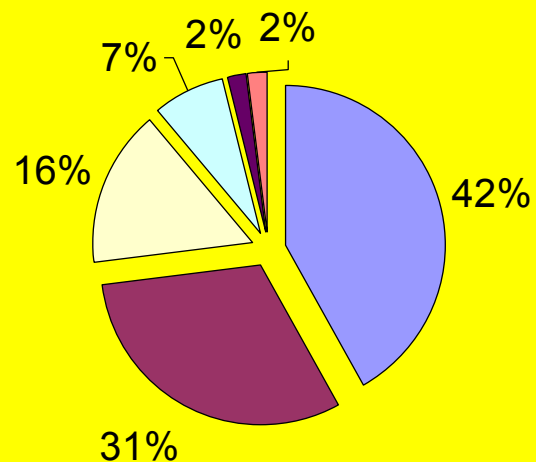


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EXTENT OF CONTAMINATED LAND IN THE NETHERLANDS

DUTCH 2009 CONTAMINATED LAND INVENTORY STATUS

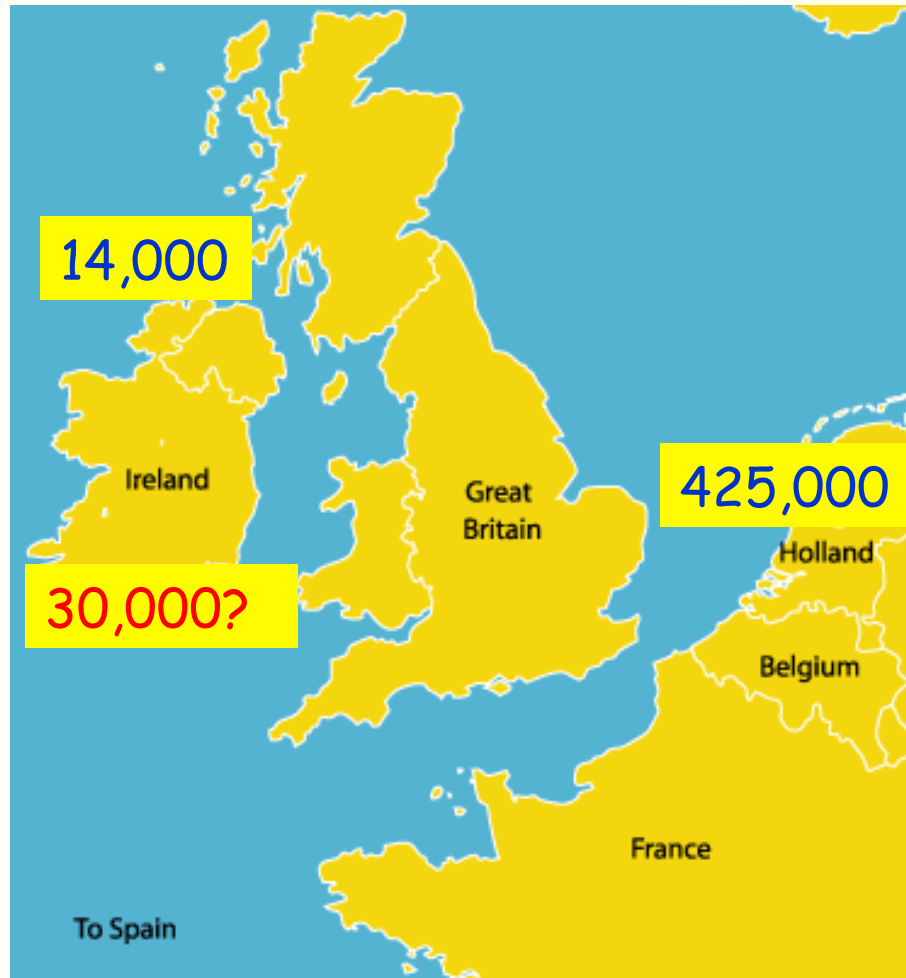


- Suspect but not yet fully investigated
- After pilot testing of selected sector sites set to low priority
- On-going Remediations & Aftercare
- Completed SI and found remediation not required
- Ongoing Remediations/Aftercare
- Completed after remediation



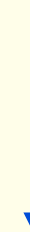
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EXTENT OF CONTAMINATED LAND IN THE IRELAND



Population:

NI - 1.8m
Rep. of I - 4.6m
Netherlands - 16.8m



Contaminated Inventory:

NI - 14k
Rep. of I - ??k
Netherlands - 425k

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CONTAMINATED LAND INVENTORY FOR REP. OF IRELAND?

WHO IS CORRECT? IRISH EPA OR NIEA

- **2006 DOELG/ARUP Report on Petroleum Sector**

| Type of Facility | Number |
|---|----------------------|
| Retail outlets | 2,033 ⁽¹⁾ |
| Petroleum Bulk Stores | 253 |
| LPG Outlets | 87 |
| Upper Tier Seveso Sites involved in storage and dispensing of petroleum and LPG | 12 |
| Lower Tier Seveso Sites involved in storage and dispensing of petroleum and LPG | 28 |
| Oil Jetties | 12 |

⁽¹⁾ Data obtained from Catalyst

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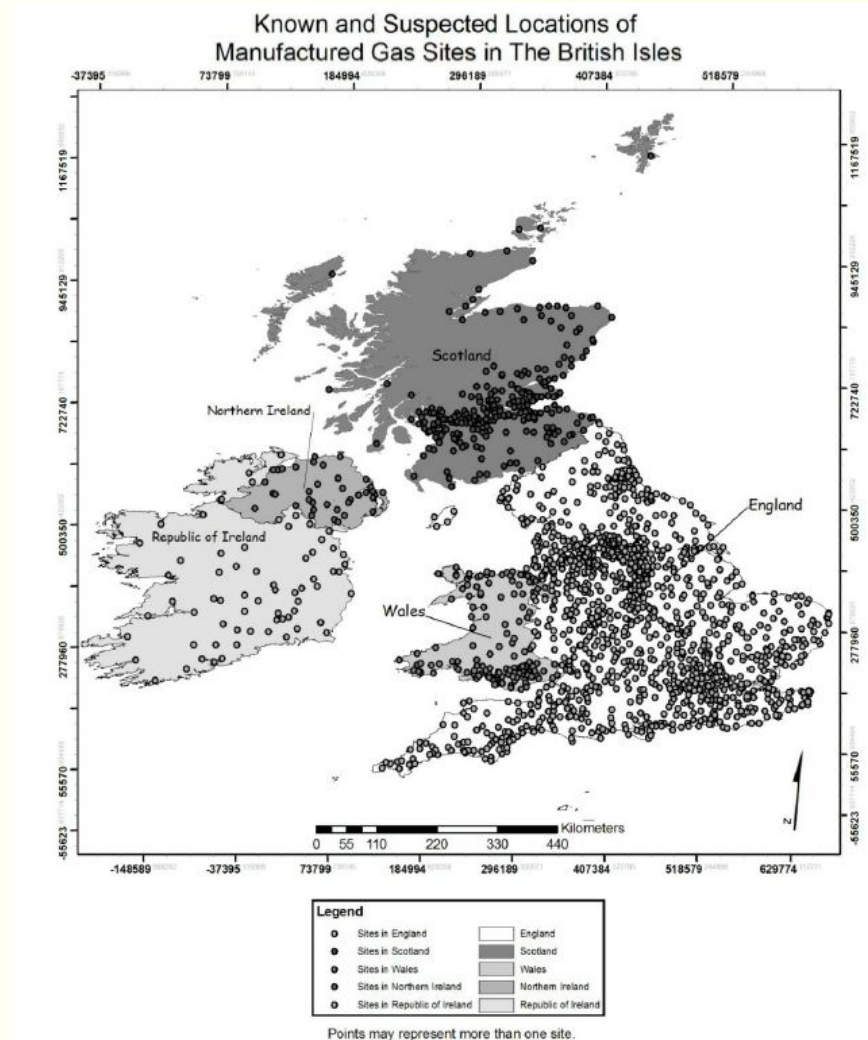
- **GSI SURGE Project, 2011 – Dublin Historic Industry Database – >2000 sites identified**
- **In EPA inventory there is an absence of information on following industrial/commercial sectors:**
 - Oil Depots (i.e. Diesel/Kerosene only) – 250-300?;
 - Dry Cleaners (768 EPA Solvent User Database);
 - Garages/Mechanic Workshops – 7,500?;
 - Car Panel Beaters/Solvent Paint Workshops – 100?;
 - Military Firing Ranges (i.e. Ballistic Berms) – 20?;
 - Local Authority Designated Derelict Property (abandoned LA housing & halting sites) – 500?
- **LA Section 22 Inventory –**
 - 344 Confirmed LA-owned Landfills; and
 - 97 Private/Illegal/Pre-1977 LFs

..... but no information on Section 26 'Hazardous Site Subset' referred to in National Hazardous Waste Management Plan

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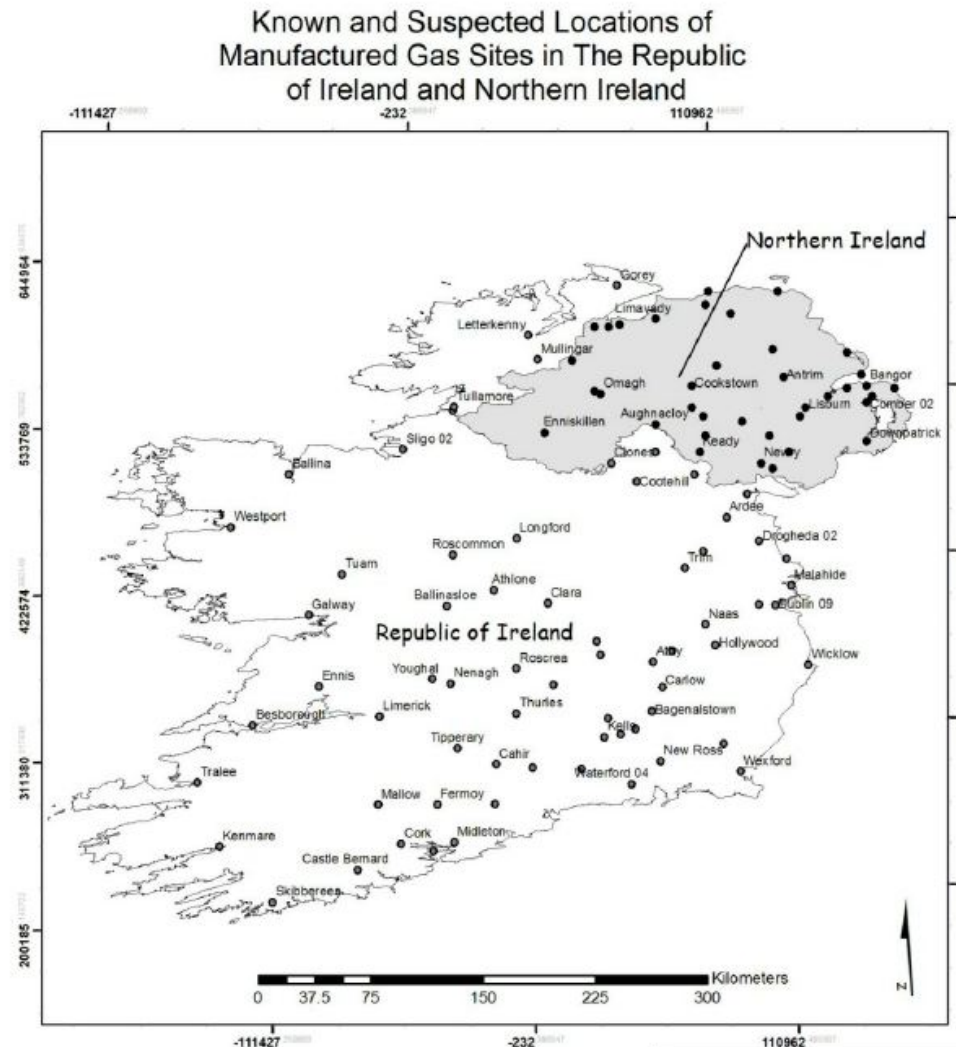
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**Town Gas Plants/
Coal Tar in BI**



WHO IS CORRECT? IRISH EPA OR NIEA



Town Gas Plants/
Coal Tar
37 in NI
138 in Rep. of I²

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Why have a Contaminated Land Inventory in Ireland?

- Will help in identifying property which may have been contaminated in the past by commercial or industrial activity
- Primary benefit in carrying out Due Diligence work on behalf of clientele wishing to assess risk to property for sale
- Allows assessment of not just site's history but also history of neighbouring property which may be a risk to the property for sale (i.e. from incoming migration from off-site contamination)
- Buyer or buyer's solicitor may then decide to approach environmental consultant to assess the site by either:
 - Phase I Site Audit (Non-intrusive SI); or
 - Phase II Site Investigation (Intrusive) - If evidence of contamination is found during initial site audit
- Good practice - assess the cost of sorting out a potential problem - have another look at the asking price.

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Current practice?

- Vendors relying on solicitors who may not have expertise to identify where a potential risk may exist
- Relying on vendor to furnish buyer with historical record of site - may not have any record
- Site may have changed hands a number of times
- Site may have been leased to high risk operation with no record
- May be no evidence of previous use (e.g. Disused Underground storage tanks (USTs), Aboveground Storage tanks (ASTs), bunds, pumps, etc)
- Subsurface contamination - 'out of sight...out of mind'
- Previous site investigation/environmental engineering reports may be of poor standard with not enough detail
- May not analysed for correct laboratory suite - relevant to industrial sector (e.g. azodyes in textile facilities, etc)

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Example - How it can go wrong

- Client is buying former commercial land adjacent to river with mixed retail use built in late 1960s. Wants to build residential apartment complex with underground carparking. On the 'surface' no indication of underlying problem
- Part of site on periphery formerly occupied by Petrol Retail Site - demolished overhead features (i.e. kiosk, pumps, ASTs, etc) but no information given on decommissioning/removal of USTs
- Ground floor unit formerly leased to Dry Cleaner operation for 3 years. No record.
- Site was partially built on:
 - Former railway depot property where railway sleepers were treated; and
 - Former Brick manufacturer
- Central heating pipes contain asbestos lagging

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Example - How it can go wrong

- Client 'blinded' by the price and buys the site.
- At pre-planning stage - Local authority notifies client of 'varied' brownfield history of site and requires SI/RA to be submitted as part of planning application.
- If LA don't know, extent of problem becomes evident on excavation of formerly infilled material for construction of underground carpark. Developer alerted by contractor of floating petroleum type product within pit and on adjacent river and solvent odours in soil excavated under slab at another location.
- Where does the contaminated soil go? Hazardous? Costs? Budget amendment. C & D Waste Management Plan to be revised and approved by LA.
- Initial **Demolition Phase** halted due to discovery of asbestos lagging - delay/postponement in contractor's work may lead to future claim against developer.
- **Site Investigation/Risk Assessment** now requested by LA to formulate **Remedial Plan**

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Example - How it can go wrong

- Soil must remain on site until classified - space?
- Project Management - delays, contractors to be notified
- EPA may need to be notified/consulted by LA
- Forced into 'dig and dump' solution - expensive
- Groundwater treatment - may require Discharge Licence from LA
- Existence of Dry Cleaning solvent in soil (i.e. PCE or PERC) requires site investigation to assess DNAPL contamination to underlying aquifer - groundwater monitoring boreholes. Off-site migration?
- Existence of shallow creosote contamination (i.e. PAHs and phenols) in soil from former railway yard requires excavation and disposal as hazardous waste
- Ash present at high volumes in shallow soil from former brick manufacturer has heavy metal and PAH contamination - disposal at non-hazardous landfill

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Where do you start?

Don't invent the wheel - Learn from international experience!

UK DOE Contaminated Land Report (CLR) Guidance

- CLR No. 3. Documentary Research on Industrial Sites
- CLR No. 5. Information Systems for Land Contamination
- CLR No. 6. Prioritization and Categorization Procedure for Sites which may be contaminated

UK Local Authority Contaminated Land Inventories

- Example - Fife Council - 7,000 Sites collated using STM GeoEnviron/ ArcGIS

NIEA Contaminated Land Database

- 30 Categories - What are they? 48 DOE Industrial Profile Guidance Documents

Dutch Contaminated Land Database

- **XX?** Categories - What are they?

Landmark Information Group

- Private firm providing desk study & mapping services to legal & environmental consultancy firms in UK

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Where do you start? - Learn from NI, UK, Dutch & USA

- UK Contaminated Land Register, 1991
 - Brickworks
 - Chemical works and chemical manufacturing business
 - Dry cleaning premises
 - Fish farms
 - Petrol Stations
 - Garages/panel beaters
 - Gas Works
 - Glass Manufacturing
 - Industries making or using wood preservatives
 - Metal Surface Treatment and Metal Product Manufact.
 - Mining & extractive Industries
 - Munitions production & distribution
 - Paper & printing works
 - Railway Land (especially depots)
 - End-of-life vehicle facilities (i.e. scrapyards)
 - Tanneries

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Where do you start? - Learn from NI, UK, Dutch & USA

- USEPA Lists, 1998
 - Analytical & Clinical Laboratories
 - Chemical manufacturing and Formulation Industries
 - Construction and Demolition Industries
 - Education Institutions (Science laboratories?)
 - Furniture Manufacturers and Re-finishing Operations
 - Laundries & Dry cleaners
 - Metals & Metal Product Manufacturing
 - Papers and Paper-Product Industries
 - Pesticide Application and End-use (e.g. sheep dip)
 - Photography and Printing
 - Textile Manufacturing
 - Vehicle and Equipment maintenance (i.e. garages) ***
 - Wholesale & Retail establishments

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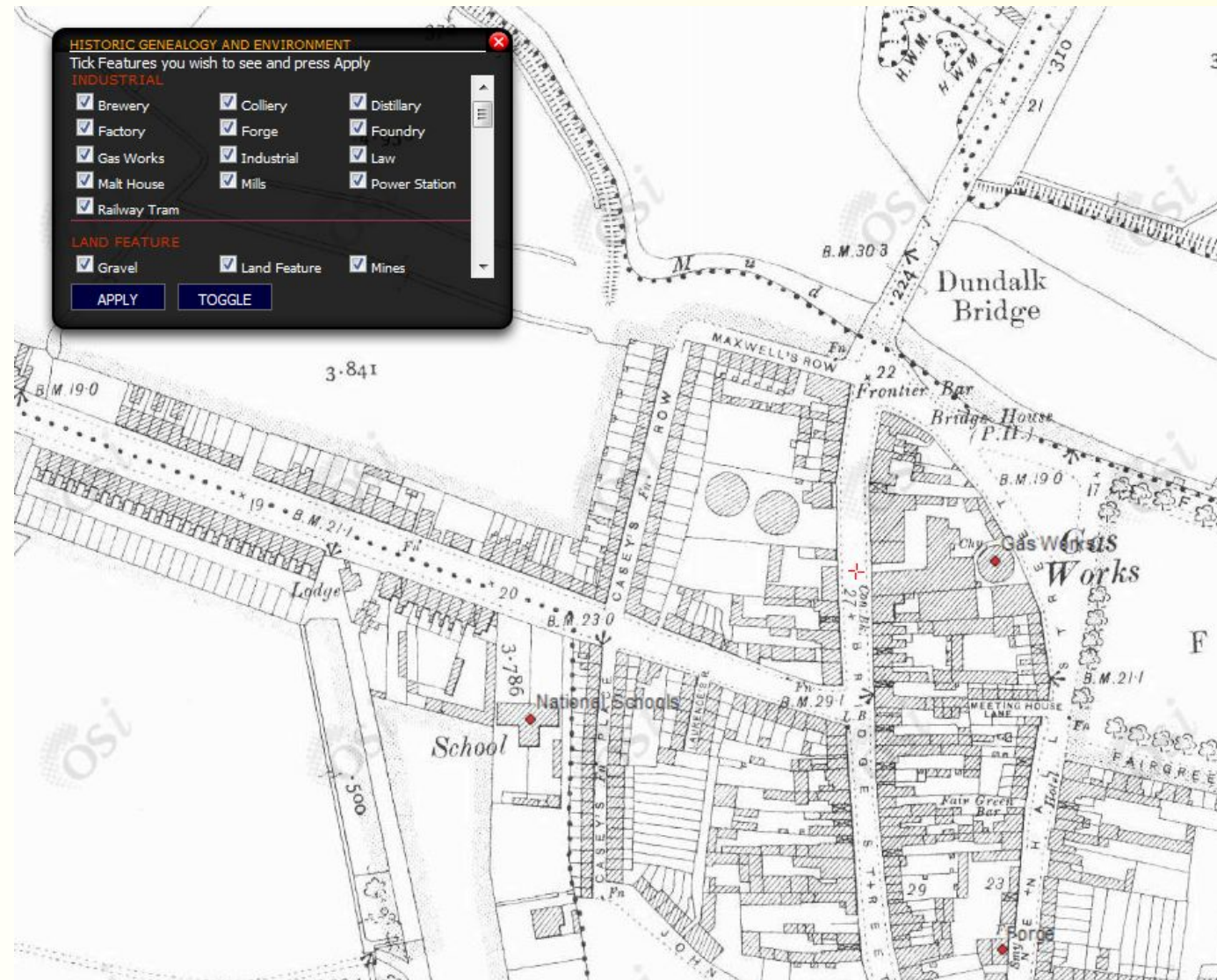
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Sources of Information

- EPA Section 22/Historic Landfills List & Section 26 Hazardous Waste Sites
- GSI SURGE Project, 2011 - Dublin Historic Industry Database
- EPA/GSI Mine Database
- Directory of Active Quarries, Pits and Mines in Ireland, 1994
- Register of Toxic & Waste Disposal Sites (Toxic & Dangerous Waste Regulations, 1982)
- Derelict Sites Registers (Derelict Site's Act, 1982)
- Register of Dangerous Places - Sanitary Services Act, 1964
- Compass Directories
- Thom's Almanac & Official Directory 1844-1960
- Thom's Dublin Directory, 1961 to present
- Thom's Commercial Directory, 1961 to present
- Bassett's Directories - county specific
- Dublin Trade Directories - Directory of Dublin Industrial Estates, 1991
- Trade Directories - 'Dublin, Leinster & Connaught Trades Directories/Gazeteer of Ireland, 1900, 1903, 1914, 1920, 1929 & 1965
- Griffith Valuation - information of land-use and uses of individual buildings
- Valuation Office Registers
- Local histories & archives

Where do you start? - OSI Historic Mapping

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THANK YOU!

