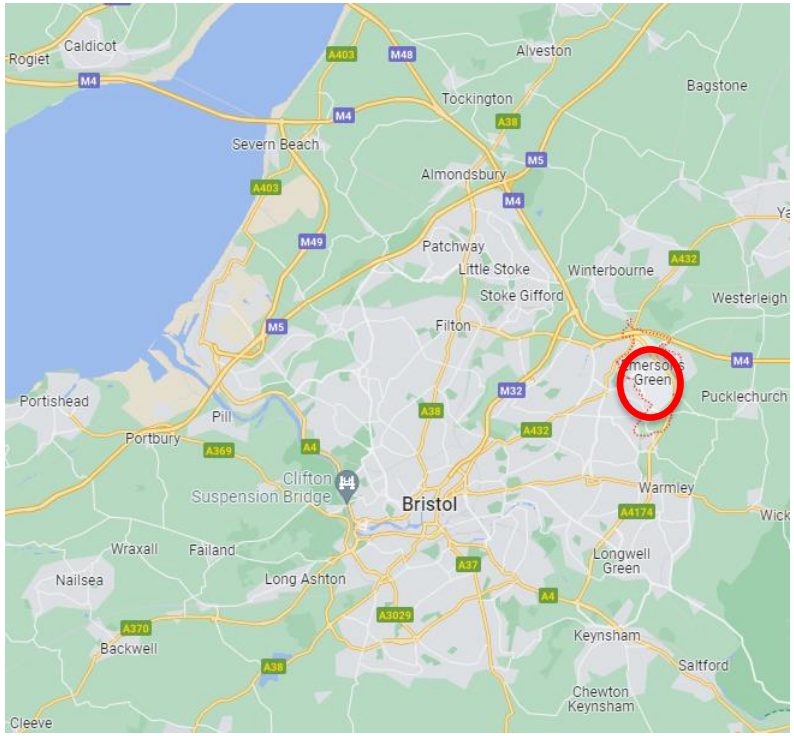
Use of a Bespoke Deposit for Recovery Permit to enable Remediation of a Former Landfill

Presented by Duncan Scott

26 October 2023

The Site

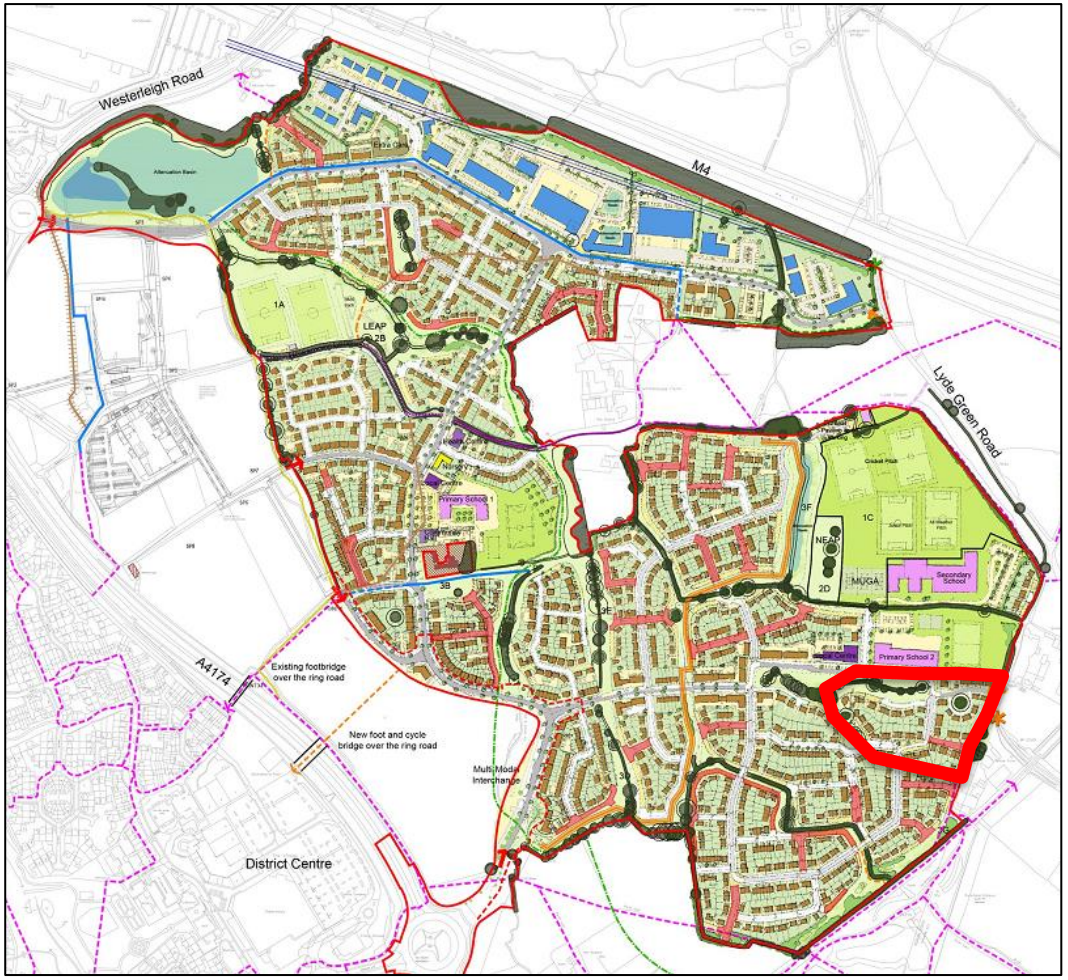
- Former landfill site near Bristol (2.3ha)
- Natural valley infilled with waste under LA licence (1984 – 1991)
- Dilute and disperse (no engineered liner)
- Licenced to receive:
  - Excavation, C&D waste
  - Concrete, glass and ceramics
  - General household clearance
  - Factory, shop and office waste
  - Foundry sands
  - Paper, cardboard
  - Plastics, wood, fabrics and metal
- Capped with ~1m of cohesive soils



- Volume of capping soils = 23,000m^3
- Volume of waste = 62,000m^3

Proposed Use

- Formed part of a 99ha Site being redeveloped for residential land use by Emersons Green Urban Village Ltd
- 79 dwellings to be built on the site of the landfill with gardens and public open space



Initially Proposed Remediation Strategy

- Phased excavation of capping soils and waste
- Treatment of waste to remove unsuitable material for re-use
  - Wood, fabrics, paper, carboard
  - Metal, plastics, rubber
- Off-site disposal of unsuitable materials
- Re-use of suitable materials as general fill to construct platform
- Import of materials for use as general fill to make up any shortfall
- Import clean cover system in residential gardens and landscaping
- Inclusion of gas protection measures in buildings

Initial Permitting Discussions with EA

- Began in late 2017
- Use of Mobile Plant Permit (to excavate and treat materials) refused
  - Treated soils would remain "waste"
  - CL:AIRE DoWCoP was not appropriate to re-use the treated soils
  - The activity is "landfill mining" for which a fixed site-based permit is required
- A bespoke waste recovery or disposal permit was suggested to control:
  - Excavation
  - Treatment
  - Storage
  - Re-use
- Disposal (landfill) permit is not compatible with a residential end-use
- Key question was whether the remediation activity was "recovery" or "disposal"

Waste Recovery Plan – Recovery vs Disposal

- Used to provide EA with information to inform their assessment of whether the remediation activity involving deposit of waste to land is "recovery" or "disposal"
- Guidance: https://www.gov.uk/government/publications/deposit-for-recovery-operators-environmental-permits/waste-recovery-plans-and-deposit-for-recovery-permits#waste-recovery-assessment
- Depositing waste to land is recovery if it can be shown that you could and would carry out the works using non-waste (if waste was not available)
- Referred to as "substitution"
- Non-waste could be primary aggregate or imported recycled aggregate that has met "end of waste" criteria

Waste Recovery Plan – Recovery vs Disposal

- EA guidance offers 3 ways to demonstrate substitution:

1. Net financial benefit from using non-waste
2. Funding has been secured to use non-waste
3. There is an obligation to carry out the works (regardless of whether waste or non-waste are used) – e.g., planning condition

Demonstrating Net Financial Benefit

- Revenue from sale of the future 79 properties MINUS the costs
- Costs included:
  - Land acquisition
  - Import of non-waste materials
  - Placement and engineering of non-waste materials
  - Building of houses, roads and infrastructure
  - Marketing and selling of the houses
  - Finance costs
- Sales Revenue minus Costs = Profit (net financial benefit)
- WRP submitted in February 2018
- EA agreed the activity was “recovery” (March 2018)

Demonstrating Net Financial Benefit

- **EA guidance has now been updated making it more difficult to demonstrate a net financial benefit for landfill remediation projects**
- Specifically, the cost of excavating and removing the waste from the site must now also be included
- Therefore, a net financial benefit may only occur where:
  - Quantity of waste is small
  - Value of houses is high

Permit Application

- Submitted in March 2018

- Involved preparation of Waste Recovery Permit Management System:
  - Site Condition Report (baseline conditions)
  - Design of treatment facility (for hazardous and non-hazardous wastes)
  - Operating procedures (e.g., dust, noise, gas monitoring)
  - Emergency plans (e.g., fire, spillages, accidental releases)
  - Comprehensive risk assessment (to environment) from the activity
    - All emissions to soil, air, water
    - Global warming impacts
  - Site-Specific Waste Acceptance Criteria (WAC) for waste to be deposited
    - To protect groundwater and surface water quality
    - CSM was heavily influenced by NPS Geoscience Operations Team
    - Assumed presence of low permeability geological barrier at base
    - Assumed construction of a reed-bed
    - Conservative compliance points

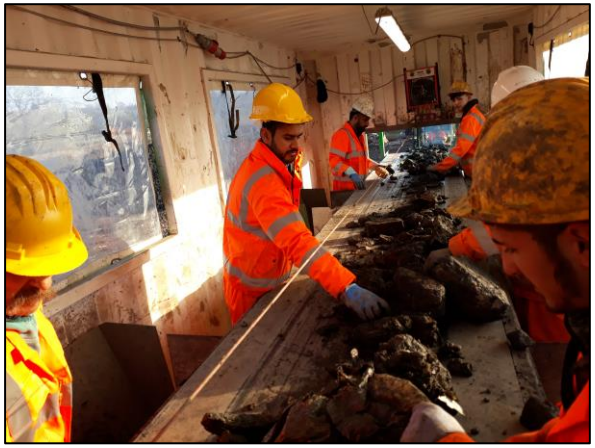
Construction of Treatment Facility

- Constructed during summer 2018 while waiting for permit

- Lined processing area (~1.5ha)
- Poured concrete slabs for processing equipment
- Perimeter surface water runoff collection system
- Temporary water storage lagoon (~8,000m^3 capacity)
- Water treatment plant
- Temporary haul roads
- Welfare compound

Treatment Technologies Used

- Excavator grabs
- Mechanical screeners
- Magnetic belts
- Air knife
- Manual sorting
- Crushing



The Final Permit

- Final version received in October 2018
- Contained various constraints/restrictions regarding:
  - Allowable waste types and quantities for treatment and deposition
    - 17 Waste Codes
    - 19 Waste Codes
  - Allowable treatment methods (for hazardous and non-hazardous wastes)
  - Allowable treatment rates (for hazardous wastes)
  - Allowable storage time-scales (for hazardous wastes)
    - <1 year for materials to be disposed off-site
    - <3 years for materials to be deposited to land as recovery
  - Requirements for groundwater sampling and reporting

Backfilling with Suitable Material

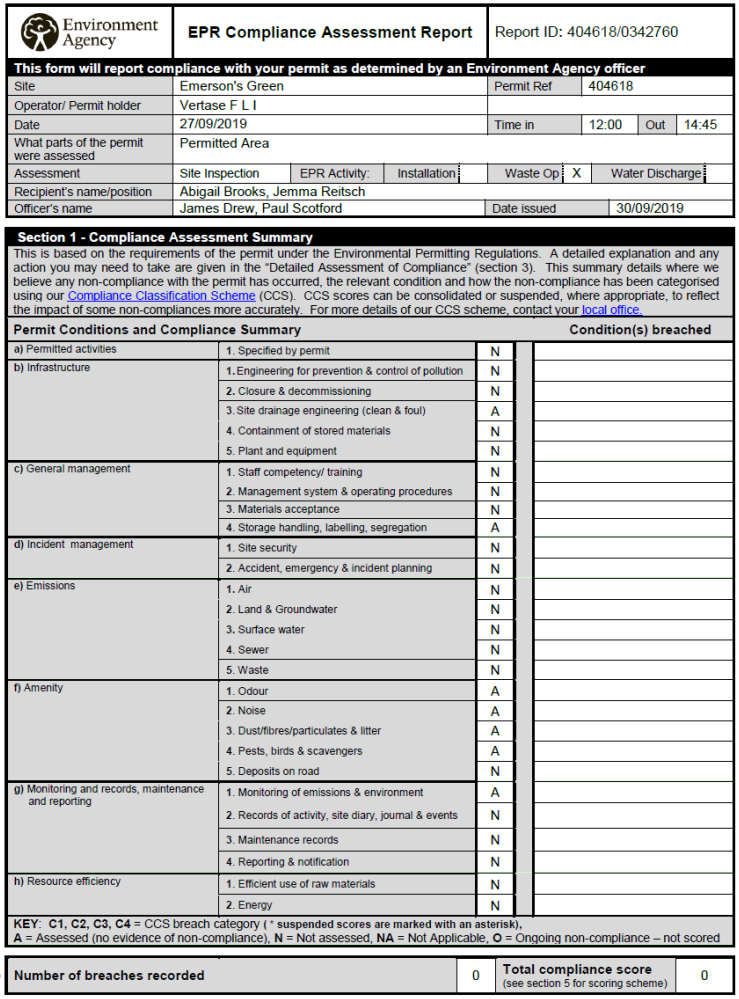
- Development platform backfill design – influenced by the permit:
  - Non-hazardous low permeability cohesive materials placed at base – termed EGB (minimum of 1m thick and maximum permeability of $1x10^{-7}$m/s)
  - Construction Quality Assurance (CQA) report required for EGB
  - Higher permeability materials placed above
- All materials tested for:
  - Waste classification (hazardous/non-hazardous)
  - Compliance with the site-specific WAC
  - Compliance with risk-based criteria to satisfy Planning regime and NHBC
  - Compliance with a GDR and earthworks specification to manage settlement risk to satisfy NHBC and LA Highways

Engineered Geological Barrier (EGB)

Materials Placed Above EGB

Permit Compliance Records

- Regular inspections by our own technically competent persons (via WAMITAB Operator Competence Scheme)
- Frequent compliance assessments by EA Permitting Officers
- No "non-compliances" during the works – Site remained "Band A"
- No increase in subsistence charges – due to good compliance record



Environment Agency	EPR Compliance Assessment Report						Report ID: 404618/0342760
This form will report compliance with your permit as determined by an Environment Agency officer							
Site	Emerson's Green			Permit Ref	404618		
Operator/ Permit holder	Vertase F L I						
Date	27/09/2019			Time in	12:00	Out	14:45
What parts of the permit were assessed	Permitted Area						
Assessment	Site Inspection	EPR Activity:	Installation	Waste Op	X	Water Discharge	
Recipient's name/position	Abigail Brooks, Jemma Reitsch						
Officer's name	James Drew, Paul Scotford			Date issued	30/09/2019		

Section 1 - Compliance Assessment Summary

This is based on the requirements of the permit under the Environmental Permitting Regulations. A detailed explanation and any action you may need to take are given in the "Detailed Assessment of Compliance" (section 3). This summary details where we believe any non-compliance with the permit has occurred, the relevant condition and how the non-compliance has been categorised using our Compliance Classification Scheme (CCS). CCS scores can be consolidated or suspended, where appropriate, to reflect the impact of some non-compliances more accurately. For more details of our CCS scheme, contact your local office.

Permit Conditions and Compliance Summary			Condition(s) breached
a) Permitted activities	1. Specified by permit	N	
b) Infrastructure	1. Engineering for prevention & control of pollution	N	
	2. Closure & decommissioning	N	
	3. Site drainage engineering (clean & foul)	A	
	4. Containment of stored materials	N	
	5. Plant and equipment	N	
c) General management	1. Staff competency/ training	N	
	2. Management system & operating procedures	N	
	3. Materials acceptance	N	
	4. Storage handling, labelling, segregation	A	
d) Incident management	1. Site security	N	
	2. Accident, emergency & incident planning	N	
e) Emissions	1. Air	N	
	2. Land & Groundwater	N	
	3. Surface water	N	
	4. Sewer	N	
	5. Waste	N	
f) Amenity	1. Odour	A	
	2. Noise	A	
	3. Dust/fibres/particulates & litter	A	
	4. Pests, birds & scavengers	A	
	5. Deposits on road	N	
g) Monitoring and records, maintenance and reporting	1. Monitoring of emissions & environment	A	
	2. Records of activity, site diary, journal & events	N	
	3. Maintenance records	N	
	4. Reporting & notification	N	
h) Resource efficiency	1. Efficient use of raw materials	N	
	2. Energy	N	

KEY: C1, C2, C3, C4 = CCS breach category (* **suspended scores are marked with an asterisk),**
A = Assessed (no evidence of non-compliance), **N** = Not assessed, **NA** = Not Applicable, **O** = Ongoing non-compliance – not scored

Number of breaches recorded	0	Total compliance score (see section 5 for scoring scheme)	0

Surrendering the Permit

- Legal test for permit surrender is demonstration that:

  "necessary measures have been taken to (a) avoid pollution risk resulting from operation of the regulated facility; and (b) to return the site of the regulated facility to a satisfactory state having regard to the state of the site before the facility was put into operation"

- Made a case for "low-risk" surrender on basis that:
  - Material re-used classified as non-hazardous (on average)
  - Site had a low gas generation potential
  - Site had a low pollution potential
  - No compliance issues during operation of the permit
  - All of this supported by waste acceptance records
  - All supported by post-remediation monitoring

- Permit surrendered in April 2021

Timeline Summary

- January 2018 – Initial discussions with EA
- February 2018 – Waste Recovery Plan submitted
- March 2018 – Bespoke DfR permit application submitted
- May 2018 – Application was declared "duly made"
- June/July 2018 – Infrastructure for treatment facility constructed
- October 2018 – Final permit was issued
- November 2018 – Remediation works commenced
- June 2020 – Physical remediation works completed
- February 2021 – Applied to surrender permit
- April 2021 – Permit surrendered

- ~3 years start to finish
- Almost ~1 year getting the permit

Some of the Lessons Learned

- Bespoke DfR permit (with treatment facility) can work for landfill remediation
- Viability of the permit depends on the activity being waste recovery
- Hazard-based nature of the permit can influence the remediation strategy
- Remediation strategy may need to depart from being risk-based (becoming more cautious) which can increase remediation costs and reduce sustainability of the remediation
- Timeframe to surrender of the permit is a big risk – particularly for residential end use

For more information:

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