

3 Site Description & Demolition Works

Introduction

- 3.1 This chapter of the ES describes the Site and Demolition Works. It also describes the anticipated methodology and phasing of site works.
- 3.2 Consideration of likely significant effects on the environment that may arise during the Demolition Works and any necessary mitigation measures are provided within Chapters 5 to 12 of this ES.

Site Description

- 3.3 The Site comprises approximately 2 hectares of developed industrial land broadly rectangular in shape. The Site is accessed by vehicles and pedestrians from Prince of Wales Drive, which forms the southern boundary to the Site.
- 3.4 The remainder of the Site is enclosed by raised railway tracks running into Victoria Rail Station, which run along the eastern and western boundaries. In between the eastern boundary and the raised railway lines is a thin strip of land which is currently occupied by Battersea Dogs and Cats Home.
- 3.5 The northern boundary is defined by ancillary buildings, which form part of Battersea Dogs and Cats Home and Network Rail operations. Beyond the adjacent land uses, the area to the north comprises ancillary land associated with Battersea Power Station, which has planning permission for a major new residential led development.
- 3.6 Land to the west of the railway lines, adjacent to Battersea Park, has been redeveloped for high density residential development. Planning permission has also been granted for the redevelopment of the office at Marco Polo House for residential purposes. To the south beyond Prince of Wales Drive development includes residential, business, education and religious uses.

- 3.7 A Site Location plan is provided in Figure 3.1 and a Site Ownership Plan is provided in Figure 3.3.
- 3.8 There are four gasholders on the Site, numbered 4, 5, 6, and 7, which have all been decommissioned. The gasholders were historically supplied with gas by the nearby Nine Elms Gasworks. The gasholders are arranged with No. 4 to the north-west, No. 5 to the northeast, No. 6 to the south-east and No. 7 to the south-west, as shown on Figure 3.3.
- 3.9 Gasholders 4, 5 and 6 were designed to expand and contract when gas was pumped in and out, according to local demand.
- 3.10 Gasholder 4 occupies the site of the first gasholder built at Battersea, which was totally rebuilt in 1963, and is an example of the most recent design of gasholder structure at this particular Site. The holder is known as a spiral guided and would rise and descend without the need for a supporting structure.
- 3.11 Gasholders 5 and 6 have columns to guide the ascent of the tanks, which rest in what used to be pits containing a water seal. Gasholder 5 has a 185 ft (56m) diameter by 31 ft (9m) deep, brick-lined tank with two lifts constructed of riveted sheetmetal panels. Gasholder 6 is a mass concrete tank with a diameter of 200 ft (61m) and depth of 46 ft 6 in (12.6m).
- 3.12 Gasholder 7 is a rigid, waterless, gasholder through which gas flow was regulated by a piston. It is known as a M.A.N. gasholder and is the tallest structure on the Site at 295 ft (90m). It is a light blue-painted, 20-sided, steel drum consisting of rolled-steel standards with five horizontal ribs clad with laterally reinforced steel panels.
- 3.13 Other structures present at the Site include:
- The Engineers House located in the south east corner of the Site (now Nos. 1 and 2 The Field);
 - The Office - single-storey building located at the southern gate to the Site to the west of the engineer's house;
 - A Pressure Reduction Station (PRS) used to decrease gas pressure for supply to household and businesses; and
 - The south boundary wall (of brick construction) along Prince of Wales Drive.
- 3.14 There are a number of trees and a garden present in the south east area of the Site, at the rear of the house.

Demolition Works

Overview

- 3.15 The Demolition Works would comprise the dismantling of the four redundant gasholder structures, de-watering, de-sludging works and demolition of associated buildings and structures to include the Engineers House (1 and 2 The Field) and the office. The existing Site structures are shown on Figure 3.3.
- 3.16 The dismantling process would involve removal of materials and waste from the Site, including concrete, steel, tar, water, sludge, asbestos and timber.
- 3.17 The works would also require the import of material to the Site (if not site-won) for the purposes of infilling voids left following removal of the structures.
- 3.18 The trees in the vicinity of the house would be maintained and protected throughout the works.
- 3.19 The existing boundary wall around the perimeter of the Site would be retained. The southern boundary wall along Prince of Wales Drive would be altered to allow for improved Site access.
- 3.20 On completion of the Demolition works, the Site would be cleared, levelled and secured. The existing Pressure Reduction System (PRS) and a number of third party service buildings would remain in their existing location and would be protected throughout the works.
- 3.21 Figure 3.4 shows the levelled Site with the retained structures, including the PRS and service buildings along the western boundary wall.

Demolition Phasing and Programme

- 3.22 Demolition Works are anticipated to take place over a period of 65 weeks and would commence in the first quarter of 2013, subject to timescales associated with obtaining planning approval.
- 3.23 The following phasing options have been considered in this ES to allow for maximum flexibility in site clearance. The final phasing would be determined by the chosen contractor within the parameters set out below:
- Demolition of the M.A.N. Gasholder 7 first, followed by Gasholders 4, 5 and 6. Gasholders 4, 5 and 6 could be removed simultaneously or one after another in no specific order;
 - Demolition of Gasholders 4, 5 and 6 (Gasholders 4, 5 and 6 could be removed simultaneously or one after another in no specific order), followed by demolition of the M.A.N. Gasholder 7.
- 3.24 The timing of demolition of the house is likely to be required early on in the demolition programme. This is necessary to allow space on site for the storage of plant, materials and staff welfare facilities.

- 3.25 The EIA and Transport Statement (Volume 3) have been based on the assumption that the Demolition Works will be completed in 2014.

Demolition Methods

- 3.26 Demolition of gasholders is a complex operation undertaken by specialist contractors. A number of demolition options exist that may be applied by the chosen contractor to remove the gasholders. For competitive tender and commercial reasons, a contractor has not been selected at this stage pending planning permission. The range of demolition methods that could occur have therefore been set out in a set of matrices (Appendix 3.1) to provide the Applicant with maximum flexibility when it comes to the competitive tender of contractor demolition services. The competitive tender of demolition works would be based on the range of methods set out in the matrices, for which approval is sought as part of this planning application.
- 3.27 In some cases, alternative demolition methods are not appropriate. For example, the preferred method of using roof mounted cranes on Gasholder 7 is considered the most appropriate on this Site.
- 3.28 A detailed description of anticipated demolition methods are described below based on the methods outlined in Demolition Methodology Matrices (Appendix 3.1).

Site Enabling, Set-Up and Operation

Hours of Work

- 3.29 The working hours for the Demolition Works would be as follows for the purposes of this ES:
- 08:00 – 18:00 hours on weekdays;
 - No working at the weekend, during Bank Holidays or Public Holidays.
- 3.30 Deliveries to, and movements off-site will take place during these hours.
- 3.31 Occasional abnormal deliveries or inspection of equipment could take place outside of these hours with special permission from LBW. This has been considered within the Transport Statement (Volume 3).

Site Access and Security

- 3.32 The Site would be prepared to handle Heavy Goods Vehicles (HGV) and other vehicle movements associated with the import of infill material, removal of demolition waste, delivery of machinery and plant, and site worker movements.
- 3.33 Site access would be from the existing Site entrance on Prince of Wales Drive and would be restricted to allow left turns in and left turns out of the Site only.

- 3.34 The suspension of four parking bays along Prince of Wales Drive would be required in order to allow for the large HGV turning circles on entry and exit.
- 3.35 Security would be provided 24 hours a day. A temporary Site security office would be installed.
- 3.36 The delivery of cranes may require additional measures. Given the nature of the load being carried, it will be necessary to consult the local police and LBW to ensure their safe arrival.
- 3.37 Further details relating to Site access are included in Chapter 5 and Volume 3 of this ES.

Car Parking and Travel to Site

- 3.38 A limited number of car parking spaces would be provided on Site. The Site labour force would be encouraged to use public transport and not to park on local public roads. Provisions would be made within the Site for essential on site parking if required for disabled members of staff or for emergencies. A Draft Travel Plan (included in Appendix F of the Transport Statement within Volume 3 of the ES) has been submitted in support of the planning application which provides further information. Any local traffic management measures for Site access will be agreed with LBW.
- 3.39 Designated areas within the Site boundary will be used for storage, servicing and delivery vehicle parking.
- 3.40 An off-site holding area for plant and materials storage would not be required.

Site Offices and Welfare Accommodation

- 3.41 It would be necessary to provide on-site office and site welfare accommodation during the course of the Demolition Works. A temporary site compound would be set up comprising an office, canteen, toilet and welfare facilities (changing room, shower).
- 3.42 The required facilities will be provided through a number of portacabins located within the Site boundary and would be sufficiently maintained to meet the minimum requirements in accordance with the CDM regulations.

Temporary Hoardings

- 3.43 If required, temporary hoarding would be erected around the perimeter of the Site prior to the works commencing and would remain in place throughout the Demolition Works. This hoarding would be designed to protect the Site from unauthorised access as well as to minimise environmental impact during the works.

- 3.44 Scaffold protection and vehicle barriers would be erected around the Pressure Reduction Station (PRS) and other retained features (live grid and district governor, low pressure valved risers, live medium pressure valve) during the works.

Services

- 3.45 Prior to commencement of the Demolition Works, routes of live services would be established and protected as appropriate. The existing PRS would be protected as described above. The two existing fire hydrants could be tested and used throughout the works.
- 3.46 Following live plant protection, existing services not required would be isolated and removed before Demolition Works commence. Pipework would be capped at approximately 1 m below ground level and backfilled over.
- 3.47 Live drainage runs will be located, proven and used for dewatering operations (see below for further details of dewatering methods).

Site Maintenance and Cleanliness

- 3.48 Water would be sprayed onto structures and stockpiles to reduce dust generation as required by the weather conditions and dust generation on Site. Water run-off from dust suppression would be minimised and directed through interceptor tanks and discharged to sewer. Please refer to Chapter 11 Water Resources and Flood Risk for further details.
- 3.49 Suitable wheel cleaning facilities and an on-site hose system would be provided and used by all vehicles before exiting the Site to minimise the impact of soil migration on the roads. The equipment would be maintained daily and used water would be contained and disposed of via an interceptor tank prior to being discharged to the mains sewer.

Artificial Lighting

- 3.50 Temporary lighting would be installed where ambient light is insufficient during working hours. Security lighting would also be installed for use during the Demolition Works.
- 3.51 The main contractor would ensure that any artificial lighting of the Site and its perimeter is sufficient to ensure the safety of pedestrians. In addition, artificial lighting would be located and orientated so that it does not cause intrusion to adjacent residential property or distract passing motorists.
- 3.52 All temporary lighting would be designed in accordance with the Institute of Lighting Engineers (ILE) Guidance Notes for the Reduction of Obtrusive Light GN01:2011 and in consultation with a professional lighting designer.

Fire Prevention

Gasholders 4, 5, and 6

- 3.53 Fire points would be installed around the Site and specifically near any hot works operations. A strict hot works permit procedure would be followed and a water hydrant and fire hose system would be installed.

Gasholder 7

- 3.54 Water would be provided to the top of Gasholder 7 for fire fighting and a collection of fire extinguishers on the gasholder roof and on top of the piston at designated fire points.
- 3.55 The existing timber roof of Gasholder 7 would be removed and replaced with fire retardant sheeting in designated access and working zones of the roof.
- 3.56 A wireless heat detection system would be installed below the gasholder roof to monitor smoke or fires remotely and trigger an alarm at both roof and ground level should smoke or fire be detected.

Demolition – Structures and Methods

Ancillary Structures

- 3.57 Ancillary buildings would be demolished with 360 degree excavators and by hand where adjacent to other structures or site boundaries. The houses at 1 and 2 The Field and the office would be demolished.
- 3.58 The boundary wall along Prince of Wales Drive would remain in place, with minor alterations to the entrance to enable access and egress for HGVs. Amended access arrangements are shown within Appendix E of the Transport Statement (Volume 3).

Gasholders 4, 5 and 6

- 3.59 Dewatering and de-sludging would be required for the three below ground holders (4, 5 and 6) followed by on-site treatment and discharge of gasholder seal water and other water to foul sewer in accordance with the existing discharge consent. Demolition and infilling would then take place. The in-ground tank structures of gas holders 4, 5 and 6 would remain in-situ.
- 3.60 For Gasholders 4, 5 and 6 the following demolition sequence would apply:
1. Dewatering / Oil removal: Removal of seal waters from each gasholder in turn, using a submersible pump with discharge through an on-site water treatment system to designated foul manholes, with an assumed discharge rate of 20 litres per second. Oil would be removed by an interceptor (for collection and disposal off-site), not discharged to sewer;

2. Removal of residual water: Residual water will be pumped out at an assumed discharge rate of 2 litres per second so that solids drop out and to limit disturbance of the sludge. The remaining suspended solids will be trapped on bag filters and not discharged to sewer, but transported off-site by HGV. An alternative option would be to lift residual water out with basal sludge and store in a bulk storage tank prior to centrifuge treatment. The resultant water would be sent to the effluent treatment plant which would run 24/7 throughout the week. This has been considered within Chapter 8 Noise and Vibration;
3. Venting to atmosphere: Prior to hot works and desludging, existing tanks are vented to the atmosphere by removing approximately 30% of the crown using cold cutting techniques (chisels);
4. Removal of basal sludge(s): Once the tank water has been removed, the remaining unpumpable sludge could be thickened by flocculation and the use of screen containers. Approximately 95% of the sludge removal would be undertaken by air conveying with an airlift tanker. Sludge would be offloaded into an on-site holding tank and treated with a polymer to cause flocculation;
5. Removal of columns, crown and rest structure: Prior to any major entry works, an engineered sequence of preparation and lowering columns would be required, dependant upon access to column guides. This would be carried out by cutting the crown into sections and removing the steel using mechanical sheers for processing. Attendant crangeage would remove the steelwork from each gasholder to the adjacent processing area;
6. Dismantling the holder lifts: Lifts would be cut into sections, potentially using hot works procedures. A crane could be used to provide access and all removed sections would be processed on Site prior to removal off-site;
7. Final de-sludge and cleaning: After demolition is complete, the remaining sludge would be removed from within cups (used to maintain a gas tight seal during operation) of gasholder lifts. Cups would be cut and lifted so any residue can be collected. A final clean of holder bases would be carried out and masonry walls would be pressure washed if needed; and
8. Disposal of sludge: All recovered sludge would be passed through mechanical dewatering plant to reduce the quantity of water disposed off at Waste Acceptance Criteria (WAC) failure rates. Relevant tests would be carried out and the sludge removed from Site by a licensed carrier to a suitable licensed disposal facility.

Gasholder 7

- 3.61 Scaffold towers and platforms would be used combined with protection screens, a rooftop lifting frame and rail system and cranes to facilitate access to Gasholder 7 through the existing hatches on the gasholder. The existing external personnel hoist would be adapted and used to gain access / egress the roof level and two additional hoists would be constructed on the external walls of the gasholder to facilitate access for demolition.
- 3.62 Gasholder 7 is waterless, and would not require dewatering or desludging as described for holders 4, 5 and 6. However, it contains a concrete piston and residual tar which would require removal.
- 3.63 The existing tar seal would be removed and replaced with a water seal. Concrete counter weights would also be removed before progressive cutting and dismantling of Gasholder 7 down to the lowest piston level.
- 3.64 Tar from the seal and external reservoir tanks would be recovered using diesel powered pumps and electric heating elements where necessary. Tar may need to remain beneath the piston with a fire blanket of water over it until demolition is complete and the internal concrete piston has been removed.
- 3.65 The perimeter of Gasholder 7 would be progressively dismantled in lifts compatible with the capacity of roof top lifting frames. The dismantled steel coverings would be lowered down to ground level in sections, reduced in size if needed, and loaded onto vehicles for removal off site for sale or recycling.
- 3.66 Air blowers would be used to control the piston height during dismantling.
- 3.67 As described above, water would be pumped to the roof of Gasholder 7 for fire control purposes. This would result in flooding of the gasholder base as water would run into the seal void and down to the base. Dewatering would take place to remove any residue water and remove tar from the holder.
- 3.68 The final stage of demolition would involve removal of the concrete base.

General (all gasholders)

- 3.69 During the Demolition Works, all gasholder structures would be dismantled by hot and cold cutting methods as follows:
- Hot cutting methods would be employed to remove columns and bracing; and
 - Cold cutting methods would be employed for removal of crown and cutting of connection between columns and the roof truss.
- 3.70 The steel gasholder coverings would be transported off-site for recycling where possible. See section below for details of steel waste disposal.

- 3.71 The existing gasholder concrete tank walls would be broken down to 1.5m - 2m below ground level (bgl). The remaining tank walls and tank bottoms will be left insitu.
- 3.72 For further information regarding the demolition methodology for all gasholders please refer to Appendix 3.1.

Waste Production, Processing and Removal

- 3.73 All gasholders and pipework are scheduled for dismantling. Wastes produced during the Demolition Works would include steel, timber, concrete, sludge, water, tar and asbestos. The estimated waste quantities for each gasholder are detailed in Table 3.1 below.

Table 3.1: Estimated Waste Quantities

Gas Holder	Estimated Waste Quantity						
	Steel (tonnes)	Concrete (m ³)	Water (m ³)	Sludge (m ³)	Tar (tonnes)	Asbestos	Timber
Holder 4	1,126						
Holder 5	278	N/A	58,457	1,959	N/A	N/A	N/A
Holder 6	467						
Holder 7 (MAN)	1,400	180	N/A	N/A	100	TBC	TBC
Total	3,271	180	58,457	1,959	100	TBC	TBC

- 3.74 Details of the waste management process for each material are detailed below:

Steel

- 3.75 An estimated weight of 3,271 tonnes of steel would be removed from the Site. Due to the likely method of dismantling, scrap sizes and shapes could be very irregular, which would give rise to large voids in loaded skips. Loads are typically 14 to 20 tonnes. A worse-case scenario in terms of vehicle numbers has been applied in the Transport Statement (Volume 3).
- 3.76 Scrap steel would be cut down on-site adjacent to the gasholders and processed into small pieces and magnet-loaded on to vehicles for removal off-site.

- 3.77 All gasholder coverings, and other appropriate materials, would be transported off-site for recycling at an appropriate location. Material could be stored on-site temporarily before being collected by HGV for removal off-site.

Concrete

- 3.78 Concrete bases and floor slabs of Gasholder 7 would be broken up and crushed or put in bins for removal off-site, or processed and used for backfill (if proven clean). The quantity of waste expected is unknown at this stage as the extent of the base in Gasholder 7 is unknown, and re-use for infill may be precluded due to contamination.
- 3.79 Concrete ballast blocks from the piston in Gasholder 7 would be crushed for re-use on-site as fill or disposed of, if contaminated. Approximately 180,000,000m³ of concrete waste is expected from this source.

Water and Sludge

- 3.80 Waste water produced during the Demolition Works from Site maintenance activities, including welfare facilities and fire prevention, would be treated and disposed of to foul sewer.
- 3.81 Water from gasholders 4, 5, and 6 would be removed by a submersible pump and discharged to foul sewer via manholes. The total volume of tank water to be analysed, removed, treated and disposed to foul drain is anticipated to be 57,620 m³. The total volume of residual water to be removed and disposed of is anticipated to be 837 m³.
- 3.82 The volume of sludge for removal, treatment and disposal, and disposal of process water is anticipated to be 1,959 m³ (605 m³ in Gasholder 4; 624 m³ in Gasholder 5; and 730 m³ in Gasholder 6) to be recovered in three separate periods as demolition of each of the gasholders progresses and access for desludging is made available.
- 3.83 Sludge could be thickened by flocculation and through the use of screen containers. Thickened sludge would be removed from the Site on purpose built tankers to a treatment facility for disposal. Filming oil would be recycled if feasible.
- 3.84 The volume of sludge for off-site disposal would be reduced by 50% using press or centrifuge technology.
- 3.85 A suitably licensed waste treatment facility would be identified to dispose of the sludge and all material would be accompanied by Duty of Care paperwork.
- 3.86 The sludge waste is would require testing against Waste Acceptance Criteria (WAC) and density testing would be required to fully characterise the sludge prior to disposal. This has been considered in Chapter 10 Ground Conditions.

Tar

- 3.87 The volume of tar to be removed, treated and disposed from Gasholder 7 is anticipated to be approximately 100 tonnes. Suitable recycling / disposal locations would need to be identified by the appointed contractor.
- 3.88 Residual tar in Gasholder 7 would be mixed with sand and placed in skips for removal off-site as contaminated waste, or could be recovered and recycled as furnace fuel (if so, mixing with sand may not be undertaken).

Asbestos

- 3.89 Asbestos containing materials are known to be present in the roof covering of Gasholder 7. This is low risk and non-notifiable asbestos and would normally be removed and segregated as part of the demolition process.
- 3.90 Asbestos removals would be undertaken prior to any proposed works to dismantle existing structures.
- 3.91 Asbestos containing materials would be isolated and would be removed by a specialist contractor, in accordance with the Control of Asbestos at Work Regulations 2002.

Timber

- 3.92 The roof of Gasholder 7 is known to consist of timber, however, the quantities of waste are unknown at this stage.

Infilling

- 3.93 Three of the gasholders would leave large voids in the ground from where the structures are positioned when empty. These voids would require infilling with imported inert material as part of the demolition process. Gasholder 7 would require dismantling from height and the column guide structures for Gasholders 5 and 6 would also be removed. The estimated dimensions of each gasholder are shown in Table 3.2:

Table 3.2: Gas Holder Dimensions

Holder No.	Diameter (m)	Depth (m)	Height (m)	Volume (m ³)
Gasholder 4	55.5	9.5	N/A	20,136
Gasholder 5	56.4	9.2	18.5	19,503
Gasholder 6	61	13.8	27.5	17,074
Gasholder 7	56	N/A	87.0	N/A

N.b. Volumes are reflective of anticipated profiles of the tank bases, which are not flat, and are based on preliminary investigations / tank dipping.

- 3.94 Infilling will take place as and when the gasholder tanks become available. Fill material would be tipped in to the voids, levelled and compacted with a roller.
- 3.95 Site won materials would be used as infill where possible. Infilling with site-won materials is estimated to be a total of 500 m³.
- 3.96 It is estimated that 60,416 m³ of imported granular material would also be required. Holder tank infilling with imported tonnage would be 120,332 tonnes.
- 3.97 The source of fill material required to be imported is unknown at this stage and would be confirmed by the appointed contractor. This would be the contractor's choice based on available suitable materials at the time of the works.
- 3.98 It is anticipated that the movement of infill HGVs would be a continual stream throughout the working day with a typical HGV load of 10 m³.

Demolition Plant and Equipment

- 3.99 Consideration has been given to the types of plant that are likely to be used during the Demolition Works. The plant and equipment likely to be associated with each key element of the demolition process is set out below in Table 3.3.

Table 3.3: Types of Plant which could be used during the demolition process

Type of Machine
Site Set up and Cleanliness
Generators, conveyors, and demolition attachments
Skips for waste and recycling
Temporary hoarding to include heras fencing, concrete crash barriers, scaffolding
Wheel washers, if required
Goods and man hoists, harnesses and safety lines, perimeter rails
Scaffolding at approx. 80m in width and to a height of 90 m agl (above ground level)
Dismantling / Demolition of Structures

Type of Machine

Air blowing plant (up to 415v)

Wire saw cutting and steel tooth blade milling (to cut gas holder walls)

Hand held tools (shovels, buckets etc)

Cold cutting chisels, mechanical shears for processing, excavator mounted shears

Pneumatic hammers

Hot water pressure washer used with vacuum tanker (up to 2200psi and 10 gal/min)

Excavators, to include:

50 t excavator and breaker to demolish reinforced concrete base slab;

360 degree excavator used to peel back holder covering and lift it off, to demolish ancillary buildings, and to soft-strip and demolish buildings; and

360 degree excavator used for piston removal, to peel back holder covering and lift it off, to demolish ancillary buildings, and to soft-strip and demolish buildings.

Cranes and platforms, to include:

2 x small rooftop lifting cranes which will project up to 99m (9m above the roof height);

1 x mobile / telescopic crane ranging from 250 - 500 tonnes with a reach of approx. 100m to install the rooftop cranes on top of the MAN holder;

1 x 40 tonne crawler crane; and

41m reach capacity mobile elevated working platform.

Although unlikely due to site constraints, it has been assumed that a concrete crusher could be used

Dewatering and Desludging

Electric submersible pump

Sonde / CAT scan / CCTV for proving connection to foul sewer

Mechanical dewatering plant (decanter centrifuge and filter press)

Bulk storage tank

Specialist de-oiling equipment (skimmers, pumps and separator)

Effluent Plant (sediment / grit baffles, floating oil baffles, skimmers, aeration tank, flowmeter, oil / grit interceptors)

Demolition Traffic

- 3.100 During the Demolition Works it is currently estimated that a maximum of approximately 40 members of staff would be required on Site per day.
- 3.101 The Site has excellent public transport provisions which, combined with the minimal car parking provision, would promote sustainable travel during the course of the Demolition Works and reduce the need for site operatives to use their own vehicles.
- 3.102 The local road network would be used for the movement of HGVs transporting materials and waste to and from the Site.
- 3.103 The maximum daily traffic generation for the Site (including staff vehicles and HGV's) is estimated to be 72 two-way movements per day. With a sensitivity test applied (50% uplift on the maximum trip generation) this would increase to 108 two-way movements per day.
- 3.104 Strict monitoring and control of all vehicles entering and exiting the Site will also be maintained through out the Demolition Works and will include;
- The setting of specific delivery and collection times;
 - Consolidation of deliveries wherever possible;
 - The requirement for prior authorisation when visiting the Site via vehicle; and
 - Ensuring vehicles are clean on leaving the Site and the immediate road and pavement surfaces are kept clear of debris.
- 3.105 Temporary directional signage will be installed on the proposed incoming routes directing lorry drivers to the Site entrance.
- 3.106 Provision will be made, wherever possible, to ensure that vehicle unloading can be carried out on-site rather than on the adjacent roads.
- 3.107 All demolition traffic entering and leaving the Site will be closely controlled. Vehicles making deliveries to the Site or removing spoil or other material will travel via designated routes, which will have been previously agreed with LBW and other relevant bodies.
- 3.108 Measures will be adopted to prevent mud generated during the Demolition Works from going offsite. An Environmental Management Plan (EMP) for the Demolition Works would include a Traffic Management Plan and Travel Plan, which would be secured by either planning condition or obligation.
- 3.109 Traffic impacts during the Demolition Works have been assessed in terms of traffic movements, and effects on local air quality and noise, which are contained within the following sections of the ES:

- Traffic: Transport Statement (TS) (Volume 3) and Chapter 5: Traffic and Transportation;
- Chapter 8: Noise and Vibration; and
- Chapter 9: Air Quality.

Road Closures and Diversions

- 3.110 No road closures are envisaged at this stage; however closures of local roads may potentially be required in order to establish and remove the tower cranes or to deliver large items of building plant and infrastructure items. This will be agreed with LBW prior to commencement.
- 3.111 Notices regarding any planned closures and diversion of either roads or footpaths shall be given by the principal contractor to the, police, fire brigade and other emergency services sufficiently in advance of the required closure or diversion.

Site Drainage and Effects on Water Resources

- 3.112 Water which is held in the bases of Gasholders 4, 5 and 6 would need to be removed. There is no requirement to lower the water table.
- 3.113 Disposal of some seal and tank water would be to existing sewer connections and would be facilitated by the amendment of existing discharge consent on Site. Discharge consent for dewatering is assumed at 20 l/s.
- 3.114 Permission would be obtained from the Environment Agency (EA) for the connection of a filtration system to the foul drainage system during water removal. Effluent would be discharged into the sewer through a flowmeter and under amended discharge consent. Effluent samples would be taken at weekly intervals for monitoring purposes.
- 3.115 All liquids and solids of a potentially hazardous nature (for example diesel fuel, oils, and solvents) will be stored on surfaced areas, with bunding, to the satisfaction of the EA.
- 3.116 The appointed demolition contractor would be required to ensure that any water which may have come into contact with contaminated materials during the Demolition Works would be disposed of in accordance with the Water Resources Act (1991) and other legislation, and to the satisfaction of the Environment Agency. In addition, any risk will be reduced as far as practicable by adopting good management practices and relevant measures described in the EA's Pollution Prevention Guidelines.
- 3.117 The assessment of potential effects of the Demolition Works on water resources is presented in Chapter 11 Water Resources and Flood Risk.

Neighbour and Public Relations

3.118 A key aspect of the successful management of the Demolition Works would be the maintenance of good relations with Site neighbours and the general public. To successfully develop and implement a 'Neighbour and Public Relations Strategy', the following actions will be undertaken.

- Initial Contact: Once planning consent has been obtained, formal contact will be established with nearest neighbours and those who would be affected by the Demolition Works.
- Contact during works period: A single point of contact will be established, with a senior member of the project staff nominated for the role. This person would usually be the contractor's logistics manager. Outside normal working hours, Site security will act as the main point of contact via a dedicated phone number. Security will alert the Demolition or Logistics Manager if necessary (available 24 hours). Any complaints will be logged, fully investigated and reported to the relevant department of the LBW as soon as possible. The complainant will be informed as to what action has been taken.

3.119 Contact with neighbours and the general public throughout the Demolition Works will be pro-actively maintained with regular update meetings on a quarterly basis and the issuing of a brief news sheet on progress.

3.120 Contact details would be posted at relevant and prominent locations to the Site perimeter boundary giving details to numbers to call if required.

3.121 Any complaints will be logged on-site and, where necessary, reported to the relevant individual within LBW (and vice versa) as soon as practicable.

Prior Notice

3.122 In the event of unusual activities or events, these will be notified to LBW and to the relevant property owners or occupiers wherever possible, in advance of the activity. The relevant activities will be agreed with LBW once the detailed programme and methodology for the Demolition Works has been confirmed. This will include:

- Commencement of demolition in certain areas;
- Road or footpath closures/diversions and movements of wide loads; and
- Regular community liaison meetings and monthly newsletters / flyers will be adopted throughout the full course of the demolition works.
- Prior to commencement on site extensive liaison with and agreement of demolition methods will have to be agreed with Network Rail due to the close proximity of the main line train tracks to the east and west of the site.

- Establishing a dedicated point of contact and assigning responsibility to deal with demolition related issues if they arise. This would be a named representative from the demolition team.

Environmental Management Plan (EMP)

3.123 The preparation of an EMP is an established method of managing environmental impacts resulting from construction works. The EMP would clearly set out the methods of managing environmental issues for all involved with the Demolition Works.

3.124 The EMP would be submitted to LBW (and other relevant bodies) prior to the commencement of the works. Compliance with the EMP is anticipated to be secured by appropriate planning conditions or obligations, and the obligations contained within it passed onto the main contractors as 'Employer's Requirements' within the contract for the works.

3.125 The appointed contractor will be required to demonstrate that their proposals can comply with the content of the EMP and any conditions or obligations secured through the planning permission.

3.126 The structure of the EMP would include the following:

- A table showing the objectives, expected results, activities and responsibilities for the implementation of those activities;
- The broad plan of the phasing of the work and its context within the whole project;
- Inclusion of baseline levels for noise, vibration and dust and monitoring protocols;
- Setting of 'Threshold' and Action Levels' for noise, vibration and dust to warn of activities that may require particular care and control;
- Details of prohibited or restricted operations (location, hours, etc.);
- Institutional arrangements for its implementation and for environmental monitoring: responsibilities, role of the environmental authorities, participation of stakeholders;
- A monitoring and supervision plan (including appropriate indicators, frequency of monitoring, means to gather and analyse the data, reporting system);
- A response plan in case of accidents or unexpected results from the environmental monitoring;
- Reference to ground conditions and remedial measures and/or mitigation associated with ground contamination if necessary;

- Contact during normal working hours and emergency details outside working hours;
- Provision for reporting, public liaison, and prior notification of particular construction related activities;
- The mechanism for the public to register complaints and the procedures for responding to such complaints;
- The details of proposed routes for heavy goods vehicles travelling to and from the site; and
- Reference to management of material resources and waste (see further details in Waste Production, Processing and Removal section as described above).

3.127 The appointed contractor will be required to demonstrate how they will adhere to procedures set out in the EMP, satisfying regulations and best practices regarding environmental control.

3.128 Where individual contracts are required (for example for waste removal) these will incorporate relevant requirements in respect of environmental controls, based largely on the standard of 'good working practice' as outlined in the EMP as well as statutory requirements.

3.129 Sub-contractors will also be required to demonstrate how they would achieve the provisions of the EMP, how targets will be met and how potential effects will be minimised.

3.130 The contractor will be required to comply with all provisions of relevant legislation including:

- The Control of Pollution Act, 1974, Part iv;
- The Health and Safety at Work Act, 1974;
- The Clean Air Act, 1993; and
- The Environmental Protection Act, 1990.

Waste Management

3.131 Demolition waste and materials would be stockpiled for as short a period of time as possible before removal for re-use, recycling or disposal. Hazardous demolition waste (e.g. asbestos) will be managed and removed by authorised specialists only.

3.132 On-site storage of potentially polluting materials (e.g. oils and solvents) will be strictly limited and controlled and waste will be managed in line with the principles of the waste hierarchy and the contractor's policies and procedures.

- 3.133 Waste generation would be carefully managed and cleared to prevent nuisances such as litter, dust, odour and pests, and to maintain a “clean” working and site environment, for the benefit of all parties.
- 3.134 During the Demolition Works, requirements for the management of waste will be communicated to the appointed contractor and any sub-contractors to ensure that waste is managed in accordance with the waste hierarchy and relevant statutory controls. These measures will be controlled through the EMP (as described above) in consultation with the relevant authorities.
- 3.135 All parties will have a duty of care to ensure that waste arisings are handled in accordance with the relevant legislation governing their storage, transfer, treatment and disposal.
- 3.136 A nominated person(s) will be appointed with overall responsibility for waste management handling, inspection and reporting and will be adequately trained for this purpose.
- 3.137 All relevant contractors will be required to investigate opportunities to minimise waste arisings at source and, where such waste generation is unavoidable, to maximise the recycling and reuse potential of construction materials. Recycling of materials will largely take place off-site where noise and dust are less likely to result in effects to the occupants of surrounding properties.
- 3.138 A site waste management plan (SWMP) will be produced for the project in accordance with the requirements of the Site Waste Management Plans (SWMP) Regulations 2008 and will form part of the CEMP requirements. The SWMP will be used to:
- Specify the types and quantities of waste to be generated during the demolition process. Wastes will be identified in accordance with the List of Wastes (England) Regulations 2005 (as amended);
 - Identify opportunities for waste reduction and specify how the waste that is generated is to be managed, i.e. re-used, recycled, recovered or sent to landfill; and
 - Record how much of each type of waste is generated and the quantity re-used, recycled, recovered or sent to landfill.
- 3.139 For waste removed from the Site, notification by the Contractor for approval (via consultation with the authorities) will take place. Loads will only be deposited at authorised waste treatment and disposal sites. Deposition will be in accordance with the requirements of the EA and all relevant legislation;
- 3.140 Any person removing waste from the Site will hold a current waste carrier's licence and all waste shall be received at an authorised waste treatment or disposal facility. The nominated person(s) with responsibility for waste will ensure that all relevant authorisations are in place prior to off-site removal. No burning of construction waste will be undertaken on Site;

- 3.141 In addition, removal of any inert or non-hazardous waste from the Site will be accompanied by a Waste Transfer Note (WTN), signed by both the producer and the carrier of the waste, and correctly completed in accordance with the Environmental Protection (Duty of Care) Regulations 1991 (as amended). This will apply to the removal of both solid and liquid wastes (other than surface water run-off and foul drainage).
- 3.142 To prove the correct depositing of waste material and to prevent the occurrence of fly-tipping, removal of any hazardous waste from the Site would be accompanied by a Hazardous Waste Consignment Note (HWCN), signed by both the producer and the carrier of the waste, and correctly completed in accordance with the Hazardous Waste (England and Wales) Regulations 2005. This will apply to the removal of both solid and liquid wastes (other than surface water run-off and foul drainage).
- 3.143 Where it is identified that at least 200kg of hazardous waste will be generated in any twelve month period, the Site will be registered with the EA and a hazardous waste premises notification code obtained.
- 3.144 In general and in accordance with the principles of the UK Government's 'Waste Strategy for England 2007' a principal aim during demolition will be to reduce the amount of waste generated and exported from Site. This approach complies with the waste hierarchy where by the intention is first to minimize, then to treat at source or compact and, finally, to dispose of off-site as necessary.
- 3.145 All relevant contractors will be required to investigate opportunities to minimise and reduce waste generation, such as:
- Re-use of materials wherever feasible, e.g. re-use of crushed concrete from the demolition process for infill;
 - Segregation of waste at source where practical; and
 - Re-use and recycling of materials off-site where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing).
- 3.146 Skips will be covered to prevent dust and debris blowing around the Site, and will be cleared on a regular basis. Burning of wastes or unwanted materials will not be permitted on Site.
- 3.147 All hazardous material including chemicals, cleaning agents, solvents and solvent containing products will be properly sealed in containers at the end of each day prior to storage in appropriately protected and bunded storage areas.
- 3.148 In summary, the disposal of all waste or other materials removed from the Site will be in accordance with the requirements of the EA, Control of Pollution Act (COPA), 1974, Environment Act 1995, Special Waste Regulations 1996 and the Environmental Protection (Duty of Care) Regulations 1991.

Alternatives Considered

Location

3.149 Due to the nature of the Demolition Works, there are no alternative locations for the Demolition Works as it requires the demolition of existing structures.

Methods

3.150 Possible alternative demolition methods are limited due to the location of the Site, the specialist nature of the demolition works required, and the proximity of surrounding neighbours to the Site. The range of demolition methods are presented in Appendix 3.1. The matrices include all alternatives methods deemed acceptable or possible in the context of the Site location and nature of infrastructure to be removed.

Materials and Waste Transportation

3.151 London Plan Policy seeks to increase the use of the blue ribbon network for the transport of freight and it seeks for development close to navigable waterways to maximise water transport for bulk materials, particularly during demolition and construction phases of new development.

3.152 The Vauxhall Nine Elms Battersea (VNEB) Opportunity Area Planning Framework (OAPF) recommends maximising the use of the river and rail to deliver construction materials for new developments in the OA.

3.153 The OA contains three safeguarded wharves:

1. Cringle Dock – an operational waste site (Western Riverside Waste Authority). Specialist infrastructure enables waste transfer activities to take place in a covered dock.
2. Kirtling Wharf – an operational aggregates wharf (Cemex) which has planning permission to increase throughput of the wharf.
3. Middle Wharf – currently non-operational but considered to be capable of being made viable for waterborne freight handling purposes and may be required for construction of the Thames Tunnel. Following completion of the tunnel it should be brought back into operational wharf use and be able to contribute to the shortfall in wharf capacity in West London.

3.154 Given the estimated volume of fill that is required to infill the voids left by the removal of the gasholders and the proposed timescales for the works, consideration has been given to bringing this material in by water. Consideration has also been given to using the river to remove the demolition arisings from the Site.

- 3.155 However, as the Site is not located on a wharf, road transport would be required in order to transfer the materials to or from the river. This would require transfer of materials to or from the Site to a destination wharf via the local road network and double handling onto river based transportation. It is not possible to access the wharves via land to the north, east or west of the Site due to land ownership constraints and the presence of railway lines.
- 3.156 In addition, the destination of scrap metal to be recycled and sources of infill materials are yet to be determined. It is highly unlikely that these destinations would be located on the river. If the river is used it would lead to double, or possibly triple, handling of materials as the destination for waste steel and the origins of imported fill are not known at this stage.

Summary

- 3.157 Demolition methods have been researched and set out comprehensively with this chapter, including phasing scenarios and quantities of materials and waste. This information has formed the basis of the Environmental Impact Assessment (EIA), the findings of which are contained within Chapters 5-12 of this ES.