Paramount Park Entertainment Resort

Outline Remediation and Earthworks Strategy - Regulatory Options Position Paper

Final

London Resort Company Holdings

December 2015

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1. Introduction

1.1. Introduction

Atkins Limited (Atkins) has been appointed by London Resort Company Holdings Ltd (LRCH) to complete a remediation and earthworks strategy for the development of the Paramount Park Entertainment Resort (herein referred to as the site). The site, as defined by the Development Consent Order (DCO) limits, is an irregularly shaped 600 hectare (ha) area located on the Swanscombe Peninsula and Ebbsfleet valley, Kent. A site layout plan is shown on Drawing 5134008-ADD_Phase1-Figure001.

1.2. Background

As part of the project stakeholder engagement, a series of meetings was held during the summer and autumn of 2015 (16 June, 10 August and 21 October 2015, refer to the minutes in Appendix A from the October meeting), with LRCH and the Environment Agency. The meetings were held to discuss key considerations in terms of the earthworks strategy for development of the resort and, in particular, how the re-use of existing materials, particularly cement kiln dust (CKD) may be managed under appropriate regulatory regimes and taking account of the current waste-related environmental permits which are present in various parts of the site. From these meetings, it was agreed that Atkins would provide a strategy paper which would set out the range of regulatory options which could be applied to the scheme for further consideration by the Environment Agency. Predominantly this relates to the various sites in the northern part of the resort area which have been used for the deposit of CKD and other related industrial wastes but in addition it considers other landfilled areas in the southern part of the resort area which will also be impacted by the proposed development.

Draft versions of the strategy paper (this document) have been discussed both with the Environment Agency and LRCH and the options have been developed based on informal feedback received. Preferred options have now been developed and formal feedback from the Environment Agency is requested.

1.3. Scope

The purpose of this document is to provide an overview of regulatory options with regards to the proposed remediation earthworks strategy and permitting regime, ultimately leading to selected, preferred options, and is designed to facilitate further discussion with the various project stakeholders. This overview will then be developed into a more detailed earthworks and remediation strategy document to support the DCO submission for the proposed development which will take account of the regulatory requirements as well as the overall engineering and environmental considerations.

It is understood DCO submission is currently scheduled for mid-2016.

The scope of the document covers the following areas of the site:

- Resort Core and Broadness Marsh;
- A2 Corridor and Access Corridor, including Northfleet landfill and Bamber Pit areas;
- Swanscombe Marshes; and
- Manor Way and Kent Kraft Industrial Estate.

1.4. Guiding Principles

This remediation and earthworks strategy overview seeks to secure long-term environmental viability and endeavours to:

- encourage a sustainable approach with maximum re-use of suitable materials and minimum import and export, thereby reducing the environmental impact associated with waste disposal, vehicle movements and the exploitation of natural materials;
- ensure the site is made suitable for use in terms of both site users and environmental protection particularly in relation to controlled waters;
- ensure that the completed scheme meets the required engineering criteria for the resort development;

- where possible, seek to improve the environmental status of the wider site area including restoration of Broadness Marsh to reduce its long-term environmental impact and to improve its ecological value;
- work co-operatively with the Environment Agency, local authorities and existing environmental permit holders to achieve an optimal outcome for all parties;
- recognise all existing waste permits within the development area and work in compliance with permit requirements/variations;
- optimise the area of the development site which falls within existing environmental permits by amending the current permit boundaries to exclude the non-landfilled areas; and
- where possible utilise the CL:AIRE Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) to manage the re-use of fill materials outside of environmental permit boundaries.

2. Resort Core and Broadness Marsh

2.1. Background

Much of the northern part of the site was used for the deposition of materials from the adjacent cement industry, predominantly cement kiln dust (CKD). There are three main areas where CKD has been deposited:

- The first, Broadness Marsh, is located in the northern part of the peninsula. Broadness Marsh was the earliest disposal area for CKD on the Swanscombe Peninsula and has no existing waste-related environmental permit in place. The CKD was deposited onto the marsh base of river dredgings within CKD bunds. There is presently a leachate management system to reduce copper concentrations comprising a collection system, holding/treatment lagoons and a wetland filtration area in the north-eastern section of this area. The system has recently been up-graded to include a carbon dioxide dosing plant, to reduce pH levels of the leachate, and is in the process of being commissioned. The treated leachate is discharged to the River Thames via a discharge point on the adjacent jetty and under control of a discharge consent issued by the Environment Agency (ref. WR3237, CATM.3237).

- The second area is referred to as South Pit and Surge Pile, where disposal of CKD took place under environmental permit KP3998HW, previously P1/11/A, EAWML 19373. The permit allowed for the deposition of CKD, metal scrap, scrap rubber, waste filter cloths, empty bags, sacks and containers, snowcem waste and non-toxic excavation and demolition waste. CKD waste was deposited within Phase 1 and Phase 3 of South Pit and Surge Pile. Phase 3 was subsequently re-permitted under a currently active environmental permit RP3039SZ. No waste has been deposited within Phase 2. Both permits are now in the aftercare period with wastes no longer accepted with the exception of a limited volume of material deposited for restoration purposes under the agreed restoration plan. There is a leachate collection system present around Phase 3, which has recently been replaced, with leachate pumped to foul sewer to Springhead Treatment Works. There are existing boreholes around the perimeter of the infill areas for monitoring groundwater quality as part of the permits in addition to leachate monitoring locations.

- A third area, known as North Pit was located to the north of South Pit Phase 1 and was infilled with CKD prior to the licensing of South Pit and Surge Pile landfill in 1977. This area is not subject to a current waste-related environmental permit.

Using the zoning system developed in the desk-study (Atkins, 2014), this area includes Zone 1, Zone 2 and part of Zone 3. Based on the current masterplan, the resort core is centred in Zone 2 and includes parts of Zone 1 and Zone 3. The permitted areas within the Swanscombe peninsula are shown in 5139214-ERS-Figure101.

2.2. Ground Investigation Data

2.2.1. Introduction

A ground investigation was undertaken in 2015 and comprised 5 trial pits, 13 boreholes and 5 window samples primarily completed across the northern portion of the site[1]. Please see attached figures for locations of investigation points:

- 5134008-PHASE2-FIGURE001 (Rev. A) – As-Built Ground Investigation Plan Drawing 1 of 2; and
- 5134008-PHASE2-FIGURE002 (Rev. A) – As-Built Ground Investigation Plan Drawing 2 of 2.

2.2.2. Broadness Marsh

WS101 is located within Broadness Marsh and CKD was found between 1.20 to 6.45 m bgl, above Alluvium (depth not proven). WS102 is also located within Broadness Marsh and CKD was found between 0.5 m to 5.22 m bgl (full depth not proven). The CKD was described as loose locally poorly cemented greyish brown slightly gravelly sandy SILT or silty SAND.

[1] Atkins, 2015. London Paramount Entertainment Resort Geotechnical and Geo-Environmental Interpretative Report. Doc. ref. 5139214/GIR/Draft/Rev1.0

2.2.3. South Pit

WS202 and WS203 are located within the permitted area of South Pit Phase 3. CKD was found between 0.5 and 11.30 m bgl followed by Alluvium in WS202, while in WS203, CKD was found between 0.85 and 4.1 m bgl, and was underlain by peat. WS204 is located within South Pit Phase 1 and CKD was encountered between 0.50 and 8.90 m bgl (full depth not proven).

In locations where no CKD was found, such as BH203 located within South Pit Phase 2, Alluvium was encountered between 2.30 and 11.80 m bgl with potential River Terrace Deposits from 8.7 to 11.6 m bgl.

2.2.4. North Pit

BH202 is located in North Pit and encountered CKD to 8.0 m bgl, followed by peat to 10.60 m bgl and Alluvium to 18.10 m bgl. There was a small band of River Terrace Deposits between 18.10 and 19.70 m bgl, followed by Chalk to the end of the borehole at 32.0 m bgl.

BH201 is located within the North Pit boundary and encountered CKD to 6.5 m bgl, followed by 1.2 m thickness of reworked Alluvium, which was underlain by River Terrace Deposits starting at 7.7 m bgl. The Alluvium is considered reworked as there were pieces of an orange fibrous textile found within the core at a number of depths, and this agrees with anecdotal evidence that the Alluvium within North Pit was stripped out prior to infilling with CKD.

2.2.5. Other Areas

BH204 is located to the south-west of South Pit and encountered Made Ground to 2.30 m bgl, followed by Alluvium to 11.80 m bgl, followed by Chalk to the end of the borehole at 20.10 m bgl.

2.3. Remediation Earthworks Strategy

2.3.1. Cut and Fill Volumes

The cut and fill volumes have been updated based on the most recent masterplan received from Gensler, drawing reference 'LPER-Core Resort-Levels Study-20150901' and the current topography. The gross volume of CKD material which would need to be removed from Phase 1 and Phase 3 to reduce the current elevations to the proposed development elevations is approximately 480,000 m^3.

Based on the resort core plan in its current form, there is an overall surplus of material across the whole resort core area (which includes non-CKD material which may be re-used). Phase 2, which is marshland adjacent to the High Speed 1 (HS1) portal, and areas to the east of South Pit and Surge Pile will likely require infilling. Further design work is presently ongoing to review options for raising development platform levels to achieve a cut/fill balance for the scheme.

2.3.2. Principal Options

Based on current discussions with LRCH, the Environment Agency and the existing permit holder, four possible options for managing the CKD have been identified and are discussed in further detail below:

- Option 1 – amendment of current permit boundary to exclude the unfilled Phase 2 area, excavation to achieve development levels in Phase 1 and Phase 3 and re-use of CKD materials under the auspices of the CL:AIRE Definition of Waste: Code of Practice (DoW CoP) including the use of some of the excavated materials for the restoration of Broadness Marsh;

- Option 2 (i) – excavation of all CKD from Phase 3 together with surplus material from Phase 1 and re-deposition on Broadness Marsh under a variation of the existing waste permit within an engineered cell and subsequent variation to exclude the current Phase 3 area after all waste has been removed;

- Option 2 (ii) – development of an engineered cell in Phase 2 under a variation of the current permit, retaining the majority of the material within the resort core area with excess material deposited at Broadness Marsh;

- Option 2 (iii) – use of the surplus CKD under a Waste Recovery Permit both as geotechnically-suitable fill within the resort core and potentially the use of justifiable volumes of CKD fill for habitat restoration on Broadness Marsh also under a Waste Recovery Permit; and

- Option 3 – treatment of the CKD such that it can be re-used as a non-waste material.

2.3.2.1. Option 1

Option 1 would involve boundary variations of the existing permits for South Pit and Surge Pile. The preferred outcome of this process would be such that the revised permitted area excludes those areas within the current permit boundary where no waste has been deposited, i.e. Phase 2 and the area to the south of Phase 1. Management of the excavated materials and re-deposition in the locations outside of the revised permitted area to achieve development would be performed under the auspices of the CL:AIRE DoW CoP. This option would ensure maximum re-use of material on-site within the resort masterplan area and would reduce the requirements for the import of fill materials. There would also be an opportunity to undertake restoration works at Broadness Marsh using a proportion of the excavated materials to improve drainage and by so doing reduce leachate generation and to enhance the biodiversity of Broadness through the creation of a topography which is more appropriate to support habitat creation.

To achieve this, the following regulatory / waste permit amendments would be required such that only the current Phase 1 and Phase 3 areas would remain as regulated under a waste permit:

- a variation would need to be granted to the existing environmental permit KP3998HW to amend the boundary and exclude areas where no infilling has occurred including the Phase 2 area of the current permit; and
- a variation would need to be granted to the existing environmental permit/s KP3998HW and RP3039SZ to allow for the various development activities within the Phase 1 and Phase 3 areas.

In addition the approval of the Environment Agency would be required for the re-use of CKD material under the auspices of the CL:AIRE DoW CoP both within areas which are currently included in the permit but where no CKD or other waste has been deposited and within Broadness Marsh.

2.3.2.2. Option 2 (i)

In the event that it is not considered acceptable by the Environment Agency to re-use CKD materials which have been excavated from within the permitted South Pit/Surge Pile landfill under the auspices of the CL:AIRE DoW CoP then an alternative option would be to consider the excavation of all of the CKD and other waste materials within Phase 3 of the existing permitted landfill and surplus materials from the Phase 1 area and re-deposit all of this material within a hazardous waste disposal site on Broadness Marsh, following a variation of the existing permit. This would be achieved through initially seeking an extension of the current waste permit to include Broadness Marsh and on completion of this exercise, the intention would be to seek a further amendment/surrender of the permit for the current Phase 3 area i.e. to reduce to that of the Phase 1 area only. This would have the significant advantage of reducing the extent of the waste related environmental permitting within the core area of the resort but will require the movement of a much greater quantity of material and import of replacement materials to achieve development levels in both the Phase 2 and Phase 3 areas.

Option 2 (i) would require the following:

- an initial variation to the existing environmental permits covering Phases 1-3 to amend the boundary to encompass Broadness Marsh;
- design and construction of engineered containment for the CKD from Phase 3 and surplus materials from Phase 1 to include a suitable basal liner, cover system and leachate collection and treatment system;
- further variation of the existing environmental permits for Phases 1-3 and amendment of the permit boundary/permit surrender to exclude the current Phase 2 and 3 areas such that the only remaining permitted areas will be Phase 1 and Broadness Marsh;
- importation of inert fill material to in-fill the Phase 2 and excavated Phase 3 areas to the required development levels.

Phase 3 has been estimated by Lafarge Tarmac to have a volume of approximately 867,400 m^3 and the surplus material from Phase 1, based on a proposed development level of 4.0m AOD, is estimated to be approximately 277,450 m^3.

2.3.2.3. Option 2 (ii)

Based on discussions held with the Environment Agency on 10 August 2015, a variation to Option 2 has been considered. This option includes the development of a hazardous waste disposal cell within the resort core area. Surplus CKD waste material from Phase 1 and Phase 3 (estimated volume 630,700 m^3) would be excavated and placed within an engineered cell in Phase 2 of South Pit. This would be accomplished through variation of the existing environmental permits for Phase 1 and Phase 3 (ref. KP3998HW and RP3039SZ).

Depending on development levels, surplus suitable material from the A2 Roadway and Access Corridor may be used to raise levels within the resort core area outside of Phase 2.

Option 2 (ii) would require the following:

- an initial variation to the existing environmental permits covering Phases 1 – 3 to allow for the deposition of surplus CKD material within Phase 2;
- design and construction of engineered containment for the surplus CKD from Phase 1 and Phase 3, within the Phase 2 area, to include a suitable basal liner, cover system and leachate collection and treatment system;
- design and construction of engineered containment on Broadness Marsh for the surplus CKD material remaining after raising the land to the proposed levels; and
- design of the Resort Core infrastructure to protect the engineered containment cell and associated infrastructure and allowance for ongoing environmental monitoring.

2.3.2.4. Option 2 (iii)

As discussions progressed with the Environment Agency, Option 2 (ii) developed into Option 2 (iii). This option includes the recovery of the surplus CKD material through a Waste Recovery Permit and use of the material as geotechnically suitable fill across the Resort Core area including Phase 2 and north pit. Option 2 (iii) would require the following:

- geotechnical testing to ensure the CKD will be suitable for the development platform;
- development of a Summary of Case to be presented to the Environment Agency prior to application for the Waste Recovery Permit;
- review of comments by the Environment Agency and incorporation into the formal application for the Waste Recovery Permit; and
- engineering controls to ensure that environmental impacts are controlled, for example, to avoid contact between the CKD and the groundwater level.

2.3.2.5. Option 3

The feasibility of treating the CKD to develop an engineered fill material which would no longer be classified as a waste is currently being researched and preliminary contacts have been made. If the waste can be treated to the extent that it can be classified as a product and an End of Waste permit granted, then there is the potential for it to fall outside of waste regulatory control and would not require a permit for deposition/re-use either within or outside of the resort scheme. For this to occur as such, the waste must be converted into a distinct and marketable product which can be used in exactly the same way as a non-waste material and the waste-derived product can be stored and used with a ‘no worse’ environmental effect when compared to the non-waste material it is intended to replace.

To be appropriate, any treatment technology will need to be cost effective in the context of the overall development scheme and capable of treating the quantity of material involved in a suitable timescale to enable its re-use within the anticipated construction programme.

Should this option be adopted, the CL:AIRE DoW CoP may still be utilised for the re-use of other materials excavated outside of the permitted areas, provided it can be demonstrated that they will meet the criteria outlined in the CoP.

Under this option there may be the possibility of varying or reducing the extent of the existing environmental permits within the scheme boundary.

2.3.3. Ongoing Management of Permitted Site(s)

Under all of these options, there will be a requirement to comply with the on-going conditions of the active (varied) environmental permits, and, there are also expected to be additional requirements following the potential variation of current permits as outlined above. CMS-Enviro, the environmental consultancy which manages the current permitted sites for Lafarge Tarmac, has been engaged to support this process. The involvement of CMS-Enviro will provide consistency and the project will benefit from CMS-Enviro's extensive history and knowledge of the site.

Ongoing environmental controls, including leachate collection, treatment and monitoring will be a long-term requirement of any retained, amended or new environmental permit(s). Hence, where appropriate and depending on the selected option, leachate collection and treatment systems will need to be re-established and the network of monitoring boreholes will need to be retained where possible or re-established as part of the development following earthworks.

2.3.4. Options Summary

Based on the options outlined above, the following table summarises the options and associated benefits and disadvantages.

Table 2-1 Resort Core and Broadness Earthworks Options

Options	Description	Advantages	Disadvantages/Constraints
1	Excavation of surplus CKD from Phases 1 and 3 and re-deposition within Phase 2 and Broadness under the CL:AIRE CoP. Amendment of permit boundary to cover the Phase 1 and 3 areas only.	• Allows maximum re-use of materials within the resort core • Minimises the need for importation of fill • Minimises the area of the resort core which is subject to a waste related environmental permit • Enables restoration of Broadness Marsh	• The Environment Agency has confirmed that this would not be an appropriate use of the CL:AIRE CoP • Existing (varied) permits remain within the resort core with associated requirement for long term ongoing monitoring and management and will potentially constrain development activities • Extensive technical work may be required to demonstrate to the Environment Agency there will be no environmental detriment from re-deposition of CKD outside of permit areas under the auspices of the CL:AIRE CoP
2 (i)	Excavation of all CKD and other waste materials from Phase 3 plus surplus materials from Phase 1 and re-deposition on Broadness under permit variation. Amendment of permits to exclude Phase 2 and 3 areas.	• Removes waste related environmental permit from a large section of the resort core (Phase 3) and associated permit obligations for long term monitoring and management together with potential constraints on development activities • Enables restoration of Broadness Marsh • Combines majority of CKD into one area for ease of future management and leachate treatment	• Requires excavation and re-deposition of large volume of CKD • Requires importation of equivalent large volumes of inert materials to in-fill Phases 2 and 3 and the remainder of resort core • The Environment Agency has confirmed that any new permitted hazardous waste landfill on Broadness Marsh would be considered to be separate from the current permitted landfills and as such any CKD materials deposited in this new landfill would be subject to payment of landfill tax (current rate for hazardous waste is £82.60/tonne)
2 (ii)	Excavation of surplus material from Phase 1 and Phase 3 followed by	• Allows maximum re-use of materials within the resort core	• Development of two engineered containment cells • Constraints on development activities imposed by ongoing

Options	Description	Advantages	Disadvantages/Constraints
	deposition within an engineered contaminant cell in Phase 2.	• Minimises the needs for importation of fill material • Allows for re-use of materials within the resort core, albeit within an engineered containment cell	environmental permits and the requirement to protect the engineered containment • The area under control of environmental permits becomes larger
2 (iii)	Excavation of surplus material from Phase 1 and Phase 3 followed by use as geotechnical fill under a Waste Recovery Permit	• Allows maximum re-use of materials within the resort core • Minimises the needs for importation of fill material • Allows for re-use of materials within the resort core • The Environment Agency has also indicated that a Waste Recovery Permit could be used for the reuse of limited/justifiable volumes of CKD on Broadness Marsh for the purposes of habitat creation / enhancement	• No change to the existing environmental permits with associated ongoing long-term monitoring and management and will potentially constrain development activities • An additional permit (for Waste Recovery) will be required
3	Treatment of CKD to render it an engineering product i.e. non-waste, for re-use within the development. Amendment of permit boundary to cover the Phase 1 and 3 areas only.	• Allows maximum flexibility for re-use of materials within the development • Minimises the need for importation of fill • Negates requirement for either waste permitting or other waste related regulatory controls on the re-use of the treated materials	• Existing (varied) permits remain within the resort core with associated requirement for long term ongoing monitoring and management and will potentially constrain development activities • Potentially uneconomic option requiring mobilisation of treatment plant with associated permits • Technical feasibility of treatment still to be established and engineered product may require extensive testing to ensure suitability for intended use

Note: the above excludes requirements in terms of planning permissions which would need to be considered for options 2 and 3.

2.4. Preferred Options

Based on discussions to date with the Environment Agency and LRCH, two current preferred options have been identified; Option 2 (iii) and Option 3.

Option 2 (iii) assumes that a Waste Recovery Permit can be used to recover and reuse the surplus CKD materials on site as part of the resort core development or associated land restoration. This option will require the preparation of a Summary of Case submission for consideration by the Environment Agency along with a separate application for a Waste Recovery Permit, assuming the Summary of Case is successful. The Environment Agency's guidance on Defining Waste Recovery[2] will be used to develop the case for use of a Recovery Permit. It is also noted that should this option progress, then the Environment Agency has a 13 week determination period to process the permit application after it is submitted.

The masterplan and final levels for the Paramount Park Entertainment Resort are still in development and are likely to change from the current proposed levels to achieve a cut/fill balance. A land raise across the resort

[2] Environment Agency, 2010, Environmental Permitting Regulations (England and Wales) 2010, Regulatory Guidance Series , No EPR 13, Defining Waste Recovery: Permanent Deposit of Waste on Land

core area of an additional approximately 1.8m above current proposed levels would be sufficient to achieve a cut/fill balance allowing for a suitable separation layer at surface and in-filling of a portion of Phase 2, above the water table, with imported, clean fill. Under this scenario, excess CKD from Phase 1 and Phase 3 could be reused under a Waste Recovery Permit to enable development of the resort core platform. An additional opportunity also exists to utilise a small volume of this surplus material, also under a Waste Recovery Permit to provide habitat restoration at Broadness Marsh.

Option 3 will be used, where possible, either as a standalone solution or as part of a combination, alongside use of a Recovery Permit. Further review of potential treatment options is to be undertaken and will consider the technical feasibility, cost-effectiveness, associated permit requirements (e.g. 'End of Waste' permit) and suitability of any end products. It is likely this review will be undertaken alongside production of the case for use of a Recovery Permit.

3. Main Access Corridor and A2

3.1. Introduction

The proposed main access corridor comprises the resort road, a land train and pedestrian routes due to be constructed south to north, parallel to HS1. The access corridor will pass through Bamber Pit, Northfleet landfill and Southfleet pit. There will be additional junction improvement works to the south, where the access roads join the A2. Based on the current model of the access corridor provided by WSP, there will be a surplus of 274,000 m^3 although the majority is expected to be natural material or reworked Thanet Sands and the quantity of excess material will depend on the structural solution for the A2 junction area, i.e. cuttings/embankments.

Based on the zoning system in the Phase 1 Geo-environmental and Geotechnical Risk Assessment (Atkins, 2014), this area is Zone 6, 7, 8 and 9.

3.2. Bamber Pit North

3.2.1. Background

Bamber Pit North is a permitted landfill under environmental permit KP3598HT. It was constructed in a former chalk quarry and is currently in the aftercare period. The landfill contains almost exclusively paper industry waste. The landfill is unlined, has limited thickness of cover soils and is currently heavily vegetated. There is an existing gas collection and venting system present in the western section plus a monitoring borehole network. Ongoing monitoring and gas collection forms part of the existing permit requirements. During the construction of the HS1, material was stripped back from the eastern part of the site and re-profiled.

3.2.2. Strategy

The waste material within the access corridor will be excavated from the access corridor and re-deposited within the site under a variation of the Bamber Pit North environmental permit KP3598HT. The environmental permit boundary will be updated to exclude the access corridor, similar to the approach used for Northfleet landfill during the construction of HS1. Where required the landfill gas collection system will be reconstructed within the new waste boundary in advance of any earthworks such that the integrity and effectiveness of the gas control system is maintained throughout the construction period. The existing monitoring network will also be similarly amended as required to ensure that adequate environmental data can be provide to satisfy the Environment Agency that the site is compliant with the permit conditions.

3.3. Bamber Pit South

3.3.1. Background

Bamber Pit South forms part of the same former chalk quarry as Bamber Pit North and was partially in-filled with predominantly cement industry waste (including CKD). It has never been subject to formal waste management licensing or environmental permitting. There is a pond in the north eastern section between Bamber Pit North and South which is in continuity with the underlying chalk aquifer. The area is a potential location for a combined heat and power plant (CHP) for the resort.

3.3.2. Strategy

As Bamber Pit South is not subject to formal waste management licensing or permitting, the excavation and re-use of materials is proposed to be managed in accordance with the CL:AIRE DoW CoP under a suitable MMP and supported by appropriate environmental risk assessments.

3.4. Northfleet Landfill

3.4.1. Background

Northfleet landfill is an actively gassing, permitted landfill (environmental permit KP3898HW) which initially received a mix of domestic waste and some former ‘special’ waste, subsequently waste soils were imported

to the site as part of a restoration programme some of which would now potentially be classified as hazardous waste due to their contamination status . It has no basal liner but considerable thickness of cover soils and is steeply domed to manage surface water drainage. Northfleet landfill is currently managed by Lafarge Tarmac and a closure notice was issued on 29 November 2005. The site status was definitely closed as of 1 April 2012.

There is a gas collection network across the site leading to an active flare on the southern boundary. Surface water drainage feeds to an outfall pond to the south east of the landfill. Monitoring boreholes are present within the waste and down-gradient to the east.

3.4.2. Strategy

Re-profiling along the eastern boundary of Northfleet landfill is anticipated to be required. It is proposed that the waste material within the access corridor is excavated and either re-deposited within the site boundary, subject to agreeing a suitable permit variation with the Environment Agency, or removed from site under a duty of care for off-site treatment or disposal or re-deposited. It is understood from initial discussions held with the Environment Agency that there are potential permitting constraints relating to the re-deposition of the wastes within Northfleet landfill and hence other potential disposal options have been allowed for at this stage..

Where required the landfill gas collection and drainage systems will be reconstructed within the new waste boundary in advance of any earthworks such that their integrity and effectiveness are maintained throughout the construction period. The existing monitoring network will also be similarly amended as required to ensure that adequate environmental data can be provide to satisfy the Environment Agency that the site is compliant with the permit conditions.

The boundary of the existing permit would be amended such that it no longer includes the access roads. This is similar to the approach used for the development of HS1, adjacent to the east of the proposed location of the access roads.

The exact route of the resort road / corridor and associated local road network will be reviewed and, where possible, the impact to the Northfleet landfill and associated infrastructure will be minimised.

3.5. Southfleet Pit

3.5.1. Background

Southfleet Pit, also known as Southfleet quarry, was infilled with Thanet Formation overburden from the adjacent Eastern Quarry to the west plus a smaller volume of CKD from the Northfleet Cement Works. The depth of restoration materials in Southfleet Pit was 20 m and began initially with CKD. The CKD was a silty sand with a 2-15 % clay and 5 % coal ash content. Initially CKD was deposited as dry dust into the north end of the pit. Only small quantities were deposited in this way and the method was abandoned and a new slurry method was used which, at its peak, comprised just under 300,000 tonnes per annum.

The northern half of the former Southfleet Pit was licensed in October 1992 under Waste Management Licence (WML) P/1/36. The licence permitted the deposit of inert waste, slowly degradable waste, putrescible and difficult wastes. However, the landfill operation was never implemented and the planning permission lapsed. The site is not subject to a current waste management licence or environmental permit.

3.5.2. Strategy

As Southfleet Pit is not subject to formal waste management licensing or permitting, the excavation and re-use of materials is proposed to be managed in accordance with the CL:AIRE DoW CoP under a suitable MMP and supported by appropriate environmental risk assessments.

3.6. A2 Corridor

3.6.1. Background

Comparatively little contamination was identified in the A2 Corridor and the potential sources identified generally comprised a disused railway, a recycling centre, a waterworks, an electricity substation, and the roadway itself.

3.6.2. Strategy

The excavation and re-use of materials is proposed to be managed in accordance with the CL:AIRE DoW CoP under a suitable MMP and supported by appropriate environmental risk assessments.

4. Manor Way/Kent Kraft Industrial Estate

4.1. Introduction

To the south of Swanscombe Peninsula is an area which comprises a series of industrial/commercial properties including Northfleet Industrial Estate, Kent Kraft Industrial Estate, Manor Way Business Park and the Sportsfield site. There have been a number of potentially contaminative land uses in this area, as detailed in the Phase 1 Geo-environmental and Geotechnical Risk Assessment (Atkins, 2014) including landfills, cement works, paper mills, tar distilleries, chemical works, joinery works, electricity substations and tanks.

Based on the zoning system used in the Phase 1 Geo-environmental and Geotechnical Risk Assessment (Atkins, 2014), this area is known as Zone 4B, Zone 4C and Zone 5.

4.2. Strategy

The most recent masterplan indicates that the Chalk spine which links Manor Way with the A226 will be removed. It is estimated that this will result in a surplus of 285,000 m^3 which is included in the total surplus volume of 1.09 million m^3. It is anticipated that this material will be suitable for re-use and will be placed under the CL:AIRE CoP DoW to raise the levels to the proposed elevation. The material may be suitable for reuse on Black Duck Marsh or Botany Marsh.

The Manor Way/Kent Kraft Industrial Estate area will be managed in accordance Contaminated Land Report 11 (CLR11) (Environment Agency, 2004) and other up-to-date good practice guidance for the management of development on Contaminated Land.

There are three stages to the Model Procedures: risk assessment, options appraisal, and implementation of the remediation strategy. A preliminary risk assessment was undertaken for the site in December 2014 (Atkins, 2014). An intrusive ground investigation and subsequent environmental monitoring, to be followed by a generic quantitative risk assessment (GQRA), is currently in progress and will inform the DCO submission. A DQRA may be required following the GQRA.

Should there be relevant pollutant linkages that have been shown through risk assessment to represent unacceptable risks, there may be a requirement for remediation. The remediation will be undertaken by identifying feasible remediation options, carrying out a detailed evaluation of the feasible options to identify the most appropriate option for any particular linkage, and producing a remediation strategy.

Then, an implementation plan which will deal with all aspects of the design, preparation, implementation, verification and long-term monitoring and maintenance will be developed and followed.

We would anticipate that any proposals for remediation together with supporting investigations and risk assessments would be subject to the normal regulatory consultation and approvals process.

5. Swanscombe Marshes

5.1. Black Duck Marsh

The majority of Black Duck Marsh will be not be subject to excavation or in-filling. A small area at the eastern edge of Black Duck Marsh will require-infilling as part of the Resort Core. Suitable non-CKD materials will be used to in-fill this area, obtained from other areas of cut/demolition within the proposed development or via importation. It will be ensured that the fill material selected is appropriate given that Black Duck Marsh has moderate ecological value.

Based on the zoning system in the Phase 1 Geo-environmental and Geotechnical Risk Assessment (Atkins, 2014), this area is Zone 3.

5.2. Botany Marsh

Based on the newest masterplan, an area within the northern part of Botany Marsh will be subject to in-filling. Based on the zoning system in the Phase 1 Geo-environmental and Geotechnical Risk Assessment (Atkins, 2014), this area is Zone 4A. Suitable non-CKD material will be used to infill this area will be placed using the CL:AIRE DoW CoP under a suitable MMP and supported by appropriate environmental risk assessments.

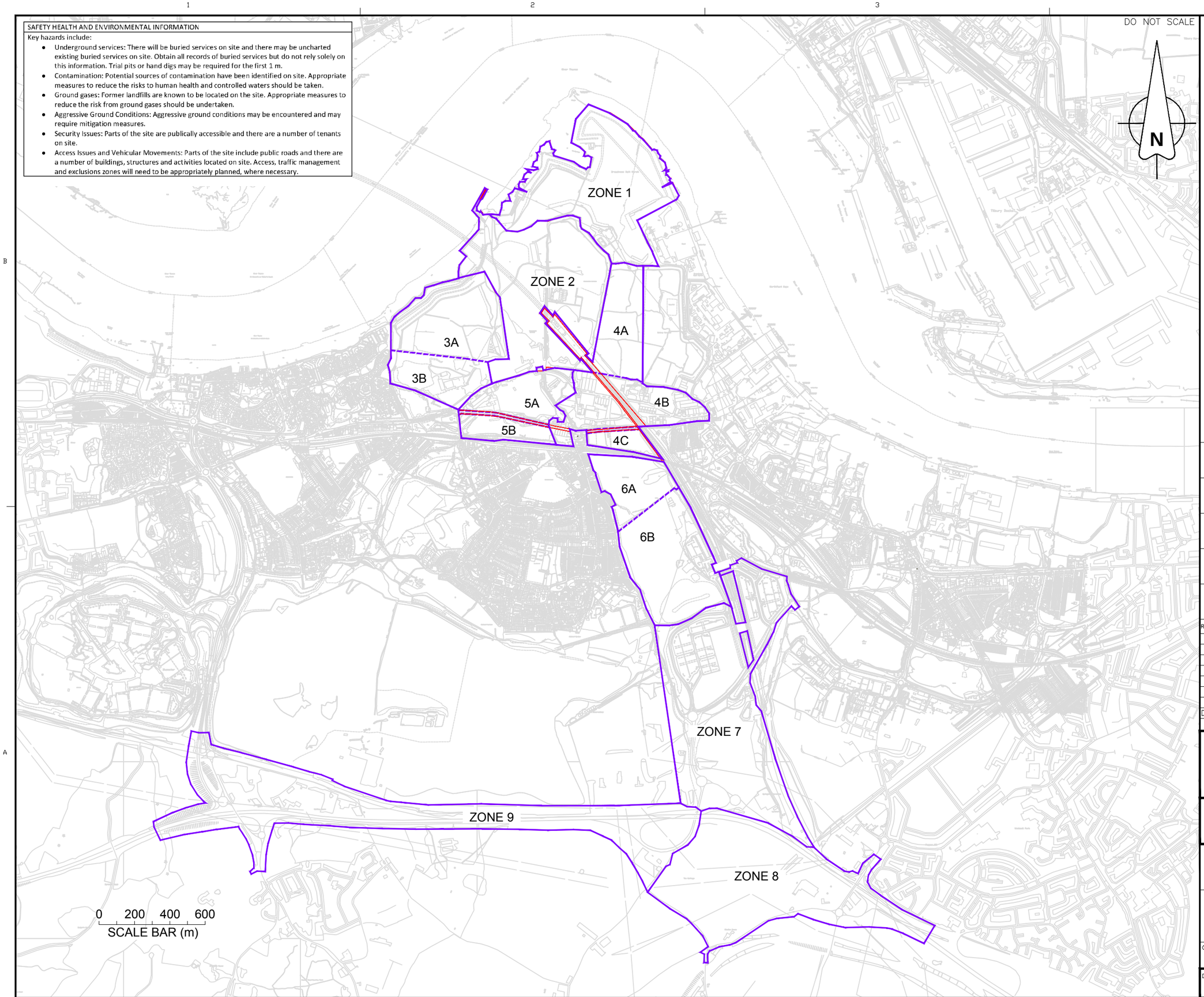
Figures

Figure 1	**5134008-ADD_Phase1-Figure001**	**Site Layout Plan**
Figure 2 1 of 2	**5134008-PHASE2-FIGURE001 (Rev. A)**	**As-Built Ground Investigation Plan Drawing**
Figure 3 2 of 2	**5134008-PHASE2-FIGURE002 (Rev. A)**	**As-Built Ground Investigation Plan Drawing**
Figure 4	**5139214-ERS-Figure101**	**Permitted Landfill Areas Within Swanscombe Peninsula**

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

Key hazards include:

- Underground services: There will be buried services on site and there may be uncharted existing buried services on site. Obtain all records of buried services but do not rely solely on this information. Trial pits or hand digs may be required for the first 1 m.
- Contamination: Potential sources of contamination have been identified on site. Appropriate measures to reduce the risks to human health and controlled waters should be taken.
- Ground gases: Former landfills are known to be located on the site. Appropriate measures to reduce the risk from ground gases should be undertaken.
- Aggressive Ground Conditions: Aggressive ground conditions may be encountered and may require mitigation measures.
- Security Issues: Parts of the site are publically accessible and there are a number of tenants on site.
- Access Issues and Vehicular Movements: Parts of the site include public roads and there are a number of buildings, structures and activities located on site. Access, traffic management and exclusions zones will need to be appropriately planned, where necessary.



DO NOT SCALE

KEY:

- ZONE BOUNDARY
- SUB-ZONE BOUNDARY
- SITE BOUNDARY

Rev.	Description	By	Date	Chk'd	Auth
	DRAFT FOR INFORMATION/COMMENT	A	-		JS
	Purpose of issue	Rev	Date		Authorised

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Client

LONDON RESORT COMPANY HOLDINGS

Project

PARAMOUNT PARK
ENTERTAINMENT RESORT

Title

SITE LAYOUT
PLAN

Original Scale	Drawn	Checked	Authorised	
1:20000	DH/ATP	LD	JS	A3
	Date 26.03.15	Date -	Date -	

Drawing Number: 5134008-ADD_PHASE1-FIGURE001 Rev: A

Job Dept. Sub Unique No.

Drawing Number 5134008-ADD_PHASE1-FIGURE001 Rev. A

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

Key hazards include:

- Underground services: There will be buried services on site and there may be uncharted existing buried services on site. Obtain all records of buried services but do not rely solely on this information. Trial pits or hand digs may be required for the first 1 m.
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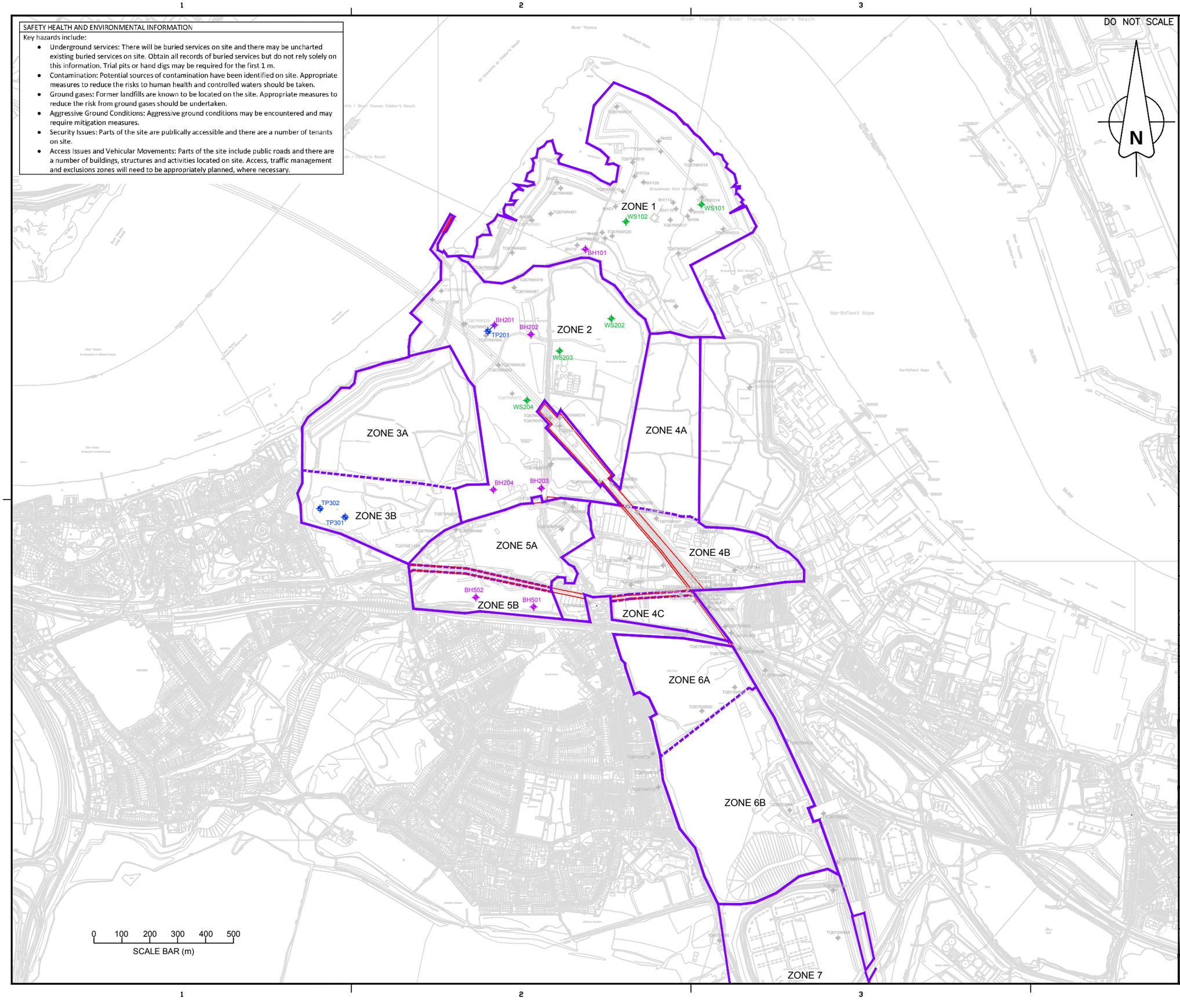

DO NOT SCALE

N

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AS-BUILT EXPLORATORY HOLES

BH604 BOREHOLE WITH STANDPIPE

WS201 WINDOW SAMPLE WITH STANDPIPE

TP301 TRIAL PIT

NOTE:

1. AS-BUILT EXPLORATORY HOLE POSITIONS TAKEN FROM GEOTECHNICAL ENGINEER LIMITED'S SURVEY ON 03 JULY 2015.
2. ZONES 7 - 9 CAN BE FOUND ON DRAWING NUMBER 5134008-PHASE2-FIGURE002.

Rev.	Description	By	Date	Chk'd	Auth
FOR INFORMATION		A	-		-
Purpose of issue		Rev	Date		Authorised

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Project
PARAMOUNT PARK ENTERTAINMENT RESORT

Title
AS-BUILT GROUND INVESTIGATION PLAN DRAWING 1 OF 2

Original Scale	Drawn	Checked	Authorised	
1:12500	ATP/JP	-	-	A3
	Date 14.07.15	Date -	Date -	

Drawing Number
5134008-PHASE2-FIGURE001

Rev
A

Job Dept. Sub Unique No.

Drawing Number 5134008-PHASE2-FIGURE001 Rev. A

DO NOT SCALE

ZONE 6B

ZONE 7

ZONE 8

ZONE 9

BH703
TP701
TP702
BH704
BH707
BH706
BH708
BH705

N

0 100 200 300 400 500
SCALE BAR (m)

ATKINS

LEGEND:

AS-BUILT EXPLORATORY HOLES (2015)

- BH101 — BOREHOLE WITH STANDPIPE
- WS201 — WINDOW SAMPLE WITH STANDPIPE
- TP301 — TRIAL PIT

HISTORICAL EXPLORATORY HOLES

- TQ67NW521 — HISTORICAL EXPLORATORY HOLE

NOTE:

1. AS-BUILT EXPLORATORY HOLE POSITIONS TAKEN FROM GEOTECHNICAL ENGINEERING LIMITED'S SURVEY ON 03 JULY 2015.
2. ZONES 1 - 6 CAN BE FOUND ON DRAWING NUMBER 5134008-PHASE2-FIGURE001.
3.

Rev.	Description	By	Date	Chk'd	Auth
FOR INFORMATION		A	15.07.15		JA
Purpose of issue		Rev	Date		Authorised

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Project
PARAMOUNT PARK
ENTERTAINMENT RESORT

Title
AS-BUILT GROUND INVESTIGATION
PLAN DRAWING 2 OF 2

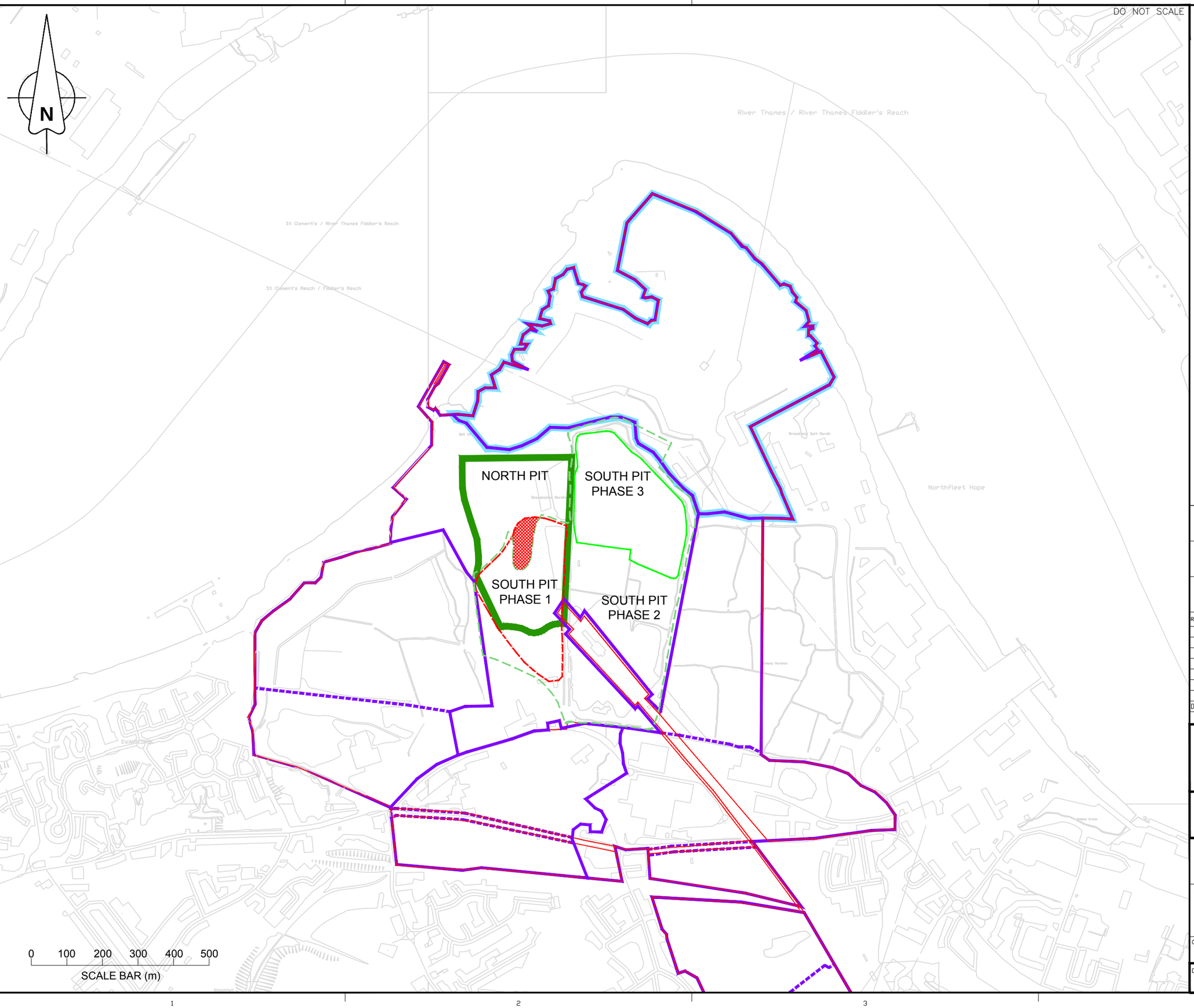
Original Scale	Drawn	Checked	Authorised	
1:12500	ATP/JP	TR	JA	A3
	Date 14.07.15	Date 15.07.15	Date 15.07.15	

Drawing Number: 5134008-PHASE2-FIGURE002
Rev: A

Job Dept. Sub Unique No.

Drawing Number 5134008-PHASE2-FIGURE002
Rev. A

DO NOT SCALE



ATKINS

KEY:

PERMIT BOUNDARIES

- PHASE 3 PERMIT BOUNDARY (REF: RP3039SZ)
- OLD WML BOUNDARY (REF: P1/11/A, EAWML 19373)
- PHASE 1 TIPPING EXTENT
- SURGE PILE AREA - INCLUDED IN PHASE 1
- APPROXIMATE BROADNESS MARSH BOUNDARY
- APPROXIMATE NORTH PIT BOUNDARY

Drawing Number 5139214-ERS-FIGURE101 Rev. A

Rev.	Description	By	Date	Chk'd	Auth
A	DRAFT FOR INFORMATION/COMMENT	A	21.09.15	–	
	Purpose of issue	Rev	Date	Authorised	

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Project
LONDON PARAMOUNT ENTERTAINMENT RESORT

Title
PERMITTED LANDFILL AREAS WITHIN SWANSCOMBE PENINSULA

Original Scale	Drawn	Checked	Authorised	
1:10000	JS	–	–	A3
	Date 21.09.15	Date –	Date –	

Drawing Number 5139214-ERS-FIGURE101 Rev A

Job Dept. Sub Unique No.

Appendices

Appendix A. Meeting Minutes (21 October 2015)

Meeting notes

Project:	Paramount Park Entertainment Resort		
Subject:	Earthworks and Remediation Strategy		
Date and time:	21 October 2015	**Meeting no:**	ATK No.5
Meeting place:	LRCH offices	**Minutes by:**	J Steeds
Present:	Jonathan Atkinson (JA) Steve Swain (SS) Kevin Doyle (KD) Jonathan Steeds (JS)	**Representing:**	EA EA LRCH Atkins

ITEM	DESCRIPTION & ACTION	DEADLINE	RESPONSIBLE
1	CKD Sites JA provided an update on the permitting aspects associated with the possible movement and reuse of CKD wastes following discussions within EA. EA will not allow modification of the current landfill permit boundaries to enable redeposition of CKD materials within Broadness as current permits are not compliant with the requirements of the Landfill Directive. Hence should disposal of CKD be required at Broadness under the scheme then a new environmental permit would be required and in this event movement of CKD from either within or outside of the current permitted areas and redeposit within a new permitted landfill at Broadness would incur landfill tax charges. If surplus CKD materials from South Pit Phases 1 and 3 of the current permitted site were to be used within the Phase 2 and North Pit to raise levels in order to provide a suitable development platform then this could be undertaken via a Recovery Permit. Suitable engineering controls would need to be included as part of the design to ensure that environmental impacts were controlled. For example it would be appropriate to ensure that the base level of any CKD materials deposited within Phase 2 remained above the groundwater level by placing suitable engineering fill below the CKD. The CKD would also need to be shown to be geotechnically suitable to support a Recovery Permit application.		

Next meeting:	TBA		
Distribution:	Attendees plus A Lepez, R Slade		
Date issued:	23/10/15	**File ref:**	5139214

NOTE TO RECIPIENTS:
These meeting notes record Atkins understanding of the meeting and intended actions arising therefrom.
Your agreement that the notes form a true record of the discussion will be assumed unless adverse comments are received in writing within five days of receipt.

ITEM	DESCRIPTION & ACTION	DEADLINE	RESPONSIBLE
	In addition the EA would allow the placement of some CKD material on Broadness under a Recovery Permit providing that it was to create/improve the current ecological status by creation of suitable habitat/topography. Only the volume of material needed for such ecological improvement would be allowed to be placed under a Recovery Permit. Placement of suitable soils on top of the CKD would also be possible under the Recovery Permit providing that the purpose of this was to create suitable habitat rather than providing an engineered cap. However it was accepted that by reducing permeability of the site surface to some degree should reduce infiltration and so have an additional benefit in reducing leachate generation. Placement of CKD under a Recovery Permit would not require payment of landfill tax. As part of the application process for a Recovery Permit a Summary of Case needs to be submitted initially which needs to include suitable sustainability evidence and environmental benefits including carbon emissions etc to support the reuse of materials within the scheme. EA requested that the Summary of Case be prepared as soon as possible. Following submission of the Summary of Case, a full application is submitted which should also address and comments made on the Summary of Case by the EA. EA has 13 weeks following submission to process the application. EA view was that a Recovery Permit may be able to be surrendered in a relatively short time period (five years was mentioned). Criteria for surrender of existing waste permits would remain as currently and there would still be a requirement for long term management and monitoring in accordance with the permit requirements. It would be possible to submit the application for a Recovery Permit in advance of the DCO submission and, should this be done and if accepted by the EA, would substantially de-risk this aspect of the DCO submission. Additional information and guidance is provided in the EA publication Regulatory Guidance Series No EPR 13 Defining Waste Recovery: Permanent Deposit of Waste on Land. This document is currently being updated. EA has requested that Atkins submit an updated version of their Regulatory Options Position Paper		

ITEM	DESCRIPTION & ACTION	DEADLINE	RESPONSIBLE
	to reflect the above and to which the EA would then provide a written response.	ASAP	Atkins
	JA also confirmed that the CL:AIRE COP was not applicable for the reuse/redeposit of CKD wastes with the possible exception of small scale earthworks incorporating CKD from outside of permitted landfill areas. The COP could potentially be applied to other materials such as reuse of suitable soils generated in other parts of the overall scheme.		
	JA offered to send through any further feedback he receives from other EA colleagues on regulatory position in relation to CKD reuse/redeposit.		JA
	Possible treatment of CKD by Carbon8 was discussed briefly. JA emphasised that a new end of waste position may be required if CKD was to be used in foam concrete and hence sufficient time would need to be allowed for this to be approved by the EA.		
	The current soils treatment plant which is located in Atkins zone 5A (Crossway Recycling Ltd?) was suggested by JA as a possible location for a treatment plant which could have the benefit of a faster permitting process by varying the current permit but would need agreement with current operator etc		
	Atkins to progress discussions with Carbon 8.		Atkins
2	Southern landfill areas		
	A brief discussion was held on the southern landfill areas (Bamber and Northfleet) where the transport corridor will require the landfill boundaries to be relocated to the west and for landfill materials to be removed and leachate/gas control systems to be reconfigured.		
	No further progress had been made on this aspect since the previous meeting with the EA pending further development of the design of the transport corridor. However principles of what was required are understood by LRCH and EA and have not changed from previous discussions.		
3	Flood issues		
	Brief discussion was held on flood issues for the scheme and the potential need to provide additional raised areas within the scheme in the event that there is a breach of the perimeter flood defences.		
	SS commented that EA only requires some aspects of essential infrastructure to be protected in this		

ITEM	DESCRIPTION & ACTION	DEADLINE	RESPONSIBLE
	event and offered to provide details/confirmation of flood level requirements		SS
4	Residential developments LRCH commented that there was a possibility that some residential development may need to be included in the scheme for key workers and possibly construction workers. Possible locations for this could include Atkins zone 3B although this included the Lovers Lane landfill site which would present a constraint to residential development or possibly West Quarry (Atkins zone 5B) which may require increasing levels to facilitate development.		
5	Third party discharge consent application EA commented that a Third party developer has submitted a consent application to discharge treated domestic sewage effluent from a proposed private STW for a residential development planned to the south of the Paramount scheme the route of which would cross Black Duck marsh to an outfall close to the current jetty/Bells Wharf and potentially would utilise one of the old slurry pipes owned by Lafarge to discharge into the Thames. A balancing lagoon would also be required as discharge would not be possible at high tide. EA offered to provide details of where relevant planning information associated with this application could be accessed.		SS
6	Further meetings It was agreed that it would be helpful to hold a further meeting once Atkins had submitted the revised Position Paper possibly in mid-November although a firm date was not agreed. EA suggested that it would also be helpful to meet again between now and the end of the year to progress agreement in principle to the Summary of Case. Further meeting date/s to be agreed		All

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