



Method Statement

Work Description: Site Excavation Walkover Surveys, Health Physics Radiation Protection Controls and Lorry Monitoring for Balfour Beatty at Olympic Park	72618/MS/001 Rev. Details: Issue 2
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PRIOR TO COMMENCEMENT																																		
Author: [Redacted] (Radiation Protection Adviser)	Date: 02 May 2014	<p>All persons who will work to this method statement to sign below to acknowledge that they have read and understood this statement and will work in accordance with the methods described within.</p> <table border="0"> <thead> <tr> <th></th> <th><u>NAME</u></th> <th><u>SIGNATURE</u></th> <th><u>DATE</u></th> </tr> </thead> <tbody> <tr><td>1</td><td></td><td></td><td></td></tr> <tr><td>2</td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td></tr> </tbody> </table>		<u>NAME</u>	<u>SIGNATURE</u>	<u>DATE</u>	1				2				3				4				5				6				7			
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Background and Scope

During the site excavation of the Queen Elizabeth Olympic Park, as part of the original enabling works, several discrete areas of low levels of radioactively contaminated spoil were discovered. This radioactive material was present due to the former use of part of the site as a landfill along with the former industries located in this part of East London, some of which incorporated processes which concentrated Naturally Occurring Radioactive Material (NORM) to elevated levels. The work that has historically been completed in dealing with this radioactive legacy is documented elsewhere.

Balfour Beatty is contracted to start the transformation of the main stadium in Queen Elizabeth Olympic Park to a legacy structure. A number of operations in this transformation will involve the disturbance of earth groundwork and consequently may carry a risk, albeit low, of revealing radioactively contaminated soil and potential exposure to operatives. Drilling, piling and excavation operations may reveal the presence of radioactively contaminated soil since they will be penetrating through the "marker layer" which demarcates the transition between materials that are known to be free from contamination and materials whose historical provenance is unknown.

As required by the Ionising Radiations Regulations 1999 (IRRs1999) (regulation 13), **if radioactivity is detected** Balfour Beatty will appoint an RPA to provide radiation protection advice to comply with the IRRs1999, guidance on compliance with the Environmental Permitting Regulations 2010 and any other associated regulations regarding ionising radiations and radioactive material.

The radiological prior risk assessment 72618/PRA/001 identified the controls to be implemented for groundwork operations within Queen Elizabeth Olympic Park. This forms the basis of controls as described in this method statement to ensure that personnel exposure (and equipment) from ionising radiations is minimised and dose uptake is maintained at levels that are As Low As Reasonably Practicable (ALARP).

The role of Nuvia Health Physics initially is to provide a watching brief and carry out radiological re-assurance monitoring of excavated material and plant, machinery and equipment – which requires one Health Physics surveyor on-site. If radioactivity is detected the RPA is to be contacted, and additional resources may be required.

Radiological "hold points" are defined within this Method Statement to determine whether any additional controls are required. Where material is identified as potentially radiologically contaminated, the relevant parties will be informed and appropriate way forward agreed (e.g. removal of the material, assay and appropriate disposal, or leaving material in place etc).

Note that any accumulation or disposal of radioactive material is subject to the requirements of the Environmental Permitting Regulations 2010, and therefore may be subject to a permit, which will need to be put in place following agreement with the Environment Agency should the requirement arise.

Welfare facilities are provided to Nuvia personnel by Balfour Beatty. Toilets, showers, canteen arrangements etc. are as per the site induction, as are the site emergency procedures. All site personnel are asked to check notice boards daily which will advise upon any changes; including assembly points; which are identified on site notice boards and advised at induction. The surveyor is to attend the daily Balfour Beatty briefing for works being monitored.

In the event of a site emergency, which requires support from the emergency services, dial the number as advised in the site induction.

No	ACTIVITY	HAZARDS	RISKS	SAFEGUARDS	EQUIPMENT, TOOLS, DRAWING ETC	SERVICES REQUIRED
1	Preliminaries					
1.1	Locate area of planned excavations below the marker layer on a daily basis, as shown by Balfour Beatty and mark on site plans. <i>(Site plans to be provided by Balfour Beatty)</i>	Excavated area	Slips, trips and falls	Pre-works brief by Site Supervisor	<ul style="list-style-type: none"> ▪ Site Plans/drawing provided by Balfour Beatty 	Site Supervisor Health Physics Surveyor (HPS)
1.2	Ensure that all conventional hazards are adequately explained by the Balfour Beatty site supervisor, and undertake a Point of Work Risk Assessment if necessary.	Conventional site hazards	Slips, trips and falls	Pre-works brief by Site Supervisor		Site Supervisor
1.3	Undertake a radiological walkover of all accessible areas of the planned excavations, prior to excavation commencement (see Hold Point in Section 1.5). Record survey on a survey report form, including a plan of the area surveyed.	Rough Terrain Moving plant/machinery	Slips, trips and falls Fatal Injury	Site supervisor to advise HPS when it is safe to survey Excavators and drivers made aware of HPS presence on site HPS to stay out of working range of plant unless they are turned off and operator given permission to approach. Use segregated pedestrian routes.	<ul style="list-style-type: none"> ▪ High visibility clothing ▪ Safety boots ▪ Gloves ▪ Safety specs ▪ Groundhog detector ▪ Field notebook to record survey data 	Site Supervisor HPS

No	ACTIVITY	HAZARDS	RISKS	SAFEGUARDS	EQUIPMENT, TOOLS, DRAWING ETC	SERVICES REQUIRED
1.4	Undertake a walkover survey of spoil as it is excavated, paying particular attention to spoil excavated from below the marker layer (see Hold Point in Section 1.5).	Rough Terrain Moving plant/machinery	Slips, trips and falls Fatal Injury	Site supervisor to advise HPS when it is safe to survey Excavators and drivers made aware of HPS presence on site. HPS to stay out of working range of plant unless they are turned off and operator given permission to approach. Use segregated pedestrian routes.	<ul style="list-style-type: none"> ▪ High visibility clothing ▪ Safety boots ▪ Gloves ▪ Safety specs ▪ Groundhog detector ▪ Field notebook to record survey data 	Site Supervisor HPS
1.5	<p>Groundhog Walkover Hold Point:</p> <p>>1300cps = mark out area for further investigation (see 1.6)</p> <p><1300cps = no remedial action required, however investigate any readings greater than twice local background and record findings on survey report</p>	Contamination	Dose uptake	Demarcate area where counts are greater than 1300cps	GroundHog probe	HPS

No	ACTIVITY	HAZARDS	RISKS	SAFEGUARDS	EQUIPMENT, TOOLS, DRAWING ETC	SERVICES REQUIRED
1.6	<p>Counts >1300cps</p> <p>Don PID and demarcate contaminated site with barrier and signage stating 'contaminated land'.</p> <p>Carry out dose rate measurement. Temporarily designate area as a Supervised Area if (>2.5µSv/h <7.5µSv/h) or Controlled area if >7.5µSv/h) in accordance with IRR99 and demarcate/sign as appropriate.</p> <p>If dose rate exceeds 7.5µSv/h, contact Site Supervisor and RPA.</p> <p>Determine if contamination is widespread or detection is caused by discrete items in ground by deploying 44B probe to contaminated area.</p> <p>Mark contaminated site on map/drawing, obtain site plot reference from Balfour Beatty and record.</p> <p>Inform Balfour Beatty site supervisor, management and RPA of presence of contaminated material.</p>	<p>Contamination</p> <p>Radiation</p> <p>Contamination spread</p>	<p>Dose uptake</p> <p>Uncontrolled site contamination leading to dose uptake</p>	<ul style="list-style-type: none"> ▪ Ori-nasal mask ▪ Coveralls ▪ Gloves ▪ Safety specs 	<ul style="list-style-type: none"> ▪ Groundhog probe ▪ 44B probe ▪ Radiation dose rate monitor ▪ Site map and drawing ▪ Field notebook ▪ Barrier netting & stakes (provided by Balfour Beatty) ▪ Personal Indicating Dosimeter (PID) 	<p>HPS</p> <p>Site supervisor</p>

No	ACTIVITY	HAZARDS	RISKS	SAFEGUARDS	EQUIPMENT, TOOLS, DRAWING ETC	SERVICES REQUIRED
2	Evidence of discrete items	<i>(This section is only to be undertaken following agreement of RPA, Balfour Beatty and relevant parties)</i>				
2.1	<p>Provided dose rates are < 7.5 microSv/h at near contact, extract discrete item from the ground and place into a sealed bag (using tools – no direct handling).</p> <p>Mark up bag with contamination and radiation details, noting the plot location the item came from.</p> <p>Arrange for discrete item to be stored securely (as directed by Balfour Beatty).</p> <p>Re-survey the ground until Groundhog action level is <1300cps.</p> <p>If survey result is <1300cps revoke the demarcation and signage</p> <p>All survey data must be recorded including the site plot reference.</p> <p>An inventory of items must be maintained (Appendix 1).</p> <p>All discrete items to be placed into secure storage location – take advice from RPA.</p>	<p>Contamination</p> <p>Radiation</p> <p>Contamination spread</p>	<p>Dose uptake</p> <p>Uncontrolled site contamination leading to dose uptake</p>	<ul style="list-style-type: none"> ▪ Ori-nasal mask ▪ Coveralls ▪ Gloves ▪ Safety specs 	<ul style="list-style-type: none"> ▪ Groundhog probe ▪ 44B probe ▪ Dose rate meter ▪ Trowel to collect sample ▪ Sealable bag to collect discrete items ▪ Secure storage area (provided by Balfour Beatty as advised by RPA) ▪ Inventory details form as shown in Appendix 1 ▪ Personal Indicating Dosimeter (PID) 	HPS

No	ACTIVITY	HAZARDS	RISKS	SAFEGUARDS	EQUIPMENT, TOOLS, DRAWING ETC	SERVICES REQUIRED
3	Widespread contamination	<i>(This section is only to be undertaken following agreement of RPA, Balfour Beatty and relevant parties)</i>				
3.1	<p>Inform Balfour Beatty site management that widespread contamination has been detected, and work in the area should not continue until it is safely removed.</p> <p>Ensure that the area remains cordoned off until a way forward has been agreed.</p> <p>Contact the RPA for advice.</p>	<p>Contamination</p> <p>Radiation</p> <p>Contamination spread</p>	<p>Dose uptake</p> <p>Uncontrolled site contamination leading to dose uptake</p>	<ul style="list-style-type: none"> ▪ Ori-nasal mask ▪ Coveralls ▪ Gloves ▪ Safety specs ▪ Hold Point to stop operations until safe way forward has been agreed ▪ Personal Indicating Dosimeter (PID) 		HPS
3.2	Determine whether any personnel or plant have come into contact with the contaminated spoil, and undertake reassurance contamination monitoring as required.	Contamination spread.	Potential dose uptake	<ul style="list-style-type: none"> ▪ Contamination monitoring by HPS 		Site supervisor to advise on plant or personnel that may require monitoring
3.3	Arrange for the contaminated spoil to be photographed and forwarded to the RPA for review.	-	-	-	Digital camera	HPS or Site Engineer

No	ACTIVITY	HAZARDS	RISKS	SAFEGUARDS	EQUIPMENT, TOOLS, DRAWING ETC	SERVICES REQUIRED
4	Lorry Monitoring – for lorries containing spoil destined for disposal off-site					
4.1	<p>Carry out background checks in the vicinity of the area, where lorry monitoring will take place using the Groundhog probe and ratemeter.</p> <p>If scaffolding is not provided by Balfour Beatty, use the Groundhog monitoring “staff” to minimise any manual handling hazard during lorry monitoring (where there is a significant number of lorries to be monitored). The Groundhog probe is to be placed in the designed for purpose holder (with the lead connectors facing upwards), with the ratemeter placed in the holder at the side (see picture in Appendix 2). Note that two lengths of staff extension are available to accommodate varying lorry heights.</p>	<p>Height (if scaffolding is provided)</p> <p>Monitoring equipment</p>	<p>Fall</p> <p>Dropped equipment</p> <p>Slips and falls</p> <p>Moving plant</p>	<p>Scaffold to be certified for safe use (if used).</p> <p>Barriers in place to minimise risk of dropped equipment.</p> <p>Suitable access to scaffold platform, i.e. stair case arrangement (if scaffold platform used)</p> <p>Ensure lorries are turned off and driver aware of presence before approaching lorry.</p>	<p>Groundhog probe and ratemeter</p> <p>Lorry monitoring form (Appendix 3)</p> <p>Groundhog monitoring staff.</p>	<p>Scaffold inspector (if scaffolding used).</p>

No	ACTIVITY	HAZARDS	RISKS	SAFEGUARDS	EQUIPMENT, TOOLS, DRAWING ETC	SERVICES REQUIRED
4.2	<p>Lorry's skip monitoring hold point: Groundhog gamma detector probe: <300 cps above background = Exempt waste >300 cps above background = potentially active waste; vehicle/load must be quarantined for further assessment</p> <p>These measurements will be averaged from the 10 measurements (5 per side, 1 metre apart – each taken at the same height – approximately half way up the load) off the lorry's skip.</p> <p>Collect radiation dose rate measurements from the 10 Groundhog locations.</p>	<p>Inappropriate radioactive waste disposal</p>	<p>Potential Breach under EPR2010</p>	<p>Health Physics to carry out lorry monitoring prior to exit from site</p> <p>Groundhog monitoring "staff" or scaffolding platform (if used)</p>	<ul style="list-style-type: none"> ▪ Groundhog gamma detector ▪ 44B probe ▪ Dose rate meter ▪ Lorry Monitoring Form – see Appendix 3 	<p>HPS</p>

No	ACTIVITY	HAZARDS	RISKS	SAFEGUARDS	EQUIPMENT, TOOLS, DRAWING ETC	SERVICES REQUIRED
4.3	<p>Carry out monitoring of lorry, while it is parked in between the scaffold platform, or using the Groundhog monitoring staff, if the scaffolding is not available (see photograph in Appendix 2).</p> <p>Perform the 5 measurements on each side of the lorry's skip with the Groundhog and radiation dose rate meter (1 meter apart from each measurement) – at the same height in the centre of the lorry's load.</p> <p>Monitoring will take approximately 10 minutes to complete. Record results on lorry monitoring form given in Appendix 3.</p> <p>Refer to 4.4 and 4.5 for hold points.</p>	<p>Contamination</p> <p>Radiation</p>	<p>Contamination spread</p> <p>External dose uptake</p>	<p>Carry out contamination checks of the lorry's wheels before it leaves the site.</p> <p>Groundhog monitoring "staff"</p>	<ul style="list-style-type: none"> ▪ 44B probe ▪ Groundhog gamma detector ▪ Radiation dose rate meter (RO10 or equivalent) ▪ Lorry Monitoring Form – see Appendix 3 	HPS
4.4	<p>Averaged measurement is <300 cps (above background) and vehicle wheels are free from contamination, the Banksman will issue the driver with a waste ticket and Health Physics will verbally confirm it is satisfactory screening for radioactivity.</p>	-	-	-	<ul style="list-style-type: none"> ▪ Waste ticket system (Balfour Beatty) ▪ HP monitoring records 	<p>Banksman</p> <p>HPS</p>
4.5	<p>If averaged measurement is >300 cps (above background), then the load must be quarantined for further assessment.</p>	-	-	-	<ul style="list-style-type: none"> ▪ HP Monitoring records 	HPS

No	ACTIVITY	HAZARDS	RISKS	SAFEGUARDS	EQUIPMENT, TOOLS, DRAWING ETC	SERVICES REQUIRED
4.6	If contamination is detected on lorry, i.e. >20 cps on 44B above background, Health Physics will decontaminate.				<ul style="list-style-type: none"> ▪ HP Monitoring records ▪ Lorry Monitoring Form – see Appendix 3 	Health Physics surveyor
5	Reporting					
5.1	Positive survey or lorry monitoring results are to be verbally reported to the Radiation Protection Adviser as soon as is practicable.	-	-	-	-	HPS
5.2	All survey results are to be documented onto standard contamination and radiation survey report.	-	-	-	-	HPS

Appendix 2

Lorry Monitoring Groundhog™ Probe “Staff” Picture



Note that this picture is to demonstrate the correct orientation of the Groundhog™ probe and ratemeter when using the staff. In the event of any uncertainty – contact the project RPA. The staff is designed such that the probe should be approximately in the centre height of the load, with the size of staff extension chosen based on the lorry load size. The staff should be rested on the ground at all times, removing the manual handling involved in lifting the Groundhog ratemeter. Five readings on each side of the lorry are taken, at equidistant points along the centre of the load (at the same height).

Appendix 3 – Lorry Monitoring Form

Lorry Registration Number	
Transfer Ticket Number	

CPS					
CPS					

Average CPS
Including
Background
for the Load:

Ground Hog Serial Number:	
Background cps:	
Dose Rate Instrument:	
Serial Number:	
If average cps > 300 NET cps = FAIL If average cps < 300 NET cps = PASS	
Wheel contamination survey completed if vehicle has entered supervised / contaminated area:	
Maximum dose rate:	
Surveyor name and signature:	
Date:	
Time:	
Comments:	