NUVIA	Technical Report	Document Ref. 72618/TR/001 Issue 1 Date 02/05/14 Page 1 of 20 Author [redacted]
Radiological Survey of Queen Elizabeth Olympic Park		

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CONTENTS

1 INTRODUCTION

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 resulting in 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 IRR1999, 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 method statement 72618/MS/001 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.

2 SCOPE OF WORK

The proposed scope of work as discussed will include:

- Radiation Protection Advice including the preparation of Radiological Risk Assessments and Method statements associated with Nuvia's work on the site.
- Provision of suitably qualified and experienced radiation monitoring personnel on site to provide a "watching brief".
- Radiation survey ("Groundhog™" survey) of the site following completion of the works.
- Additional consultancy as required including the determination of appropriate monitoring hold points (there has been a recent change in UK legislation and the Hold Points previously used for the site may no longer be appropriate).
- Provision of appropriate risk assessments for leaving any radioactive material in place (as required).
- Assistance with arranging for the disposal of radioactive wastes.

3 EQUIPMENT USED FOR SITE SURVEY

The radiation monitoring equipment used during the survey were:

- Mini-Rad 1000 - s/n 933
- Mini-Monitor 900 c/w 44b probe- s/n 036745/1045
- Electra rate meter c/w DP6 probe– s/n 2061/1767
- Electra rate meter c/w 3" NaI probe – s/n 6635/1761
- PCM5 rate meter c/w 3" NaI probe – s/n-1883/0079

4 SURVEY METHODOLOGY

The survey was conducted using a combination of the above radiation monitoring equipment by a a trained surveyor. Where possible, the survey consisted of a walkover of all accessible areas of the planned excavations, prior to excavation commencement. Areas surveyed are in shown in Appendix 7.13 - 7.16. Surveys were also undertaken of:

- the excavated pits and trenches
- excavator bucket and
- spoil heaps.

5 MONITORING RESULTS

Results were recorded on survey report forms- see Appendix 7.1 – 7.12

6 CONCLUSION

Method statement 72618/MS/001 identifies a key hold point at a threshold of 1300 Counts Per Second (CPS) for Ra-226 at 0.5Bq/g for walkover surveys – which makes the material subject to the radioactive substances legislation.

The site's background radiation readings for the monitors used was:

- Electra rate meter c/w 3" NaI probe detector is ~300 CPS,
- PCM5 c/w 3" NaI detector is ~300 CPS,
- Electra rate meter c/w DP6 is ~5CPS
- Mini Instruments 900 c/w 44b probe is ~8CPS ,
- Min Rad 1000 is ~0.1µSv/h

Given the above background readings, there were only three areas that showed slightly elevated, readings, but all were well below the 1300CPS threshold:

- (T0010), Trench to man-hole near N8 gave a response 200 to 300 CPS, but the man-hole itself provided a response of 700 CPS.
- (T009), Man-hole at N9 and trench towards N10 gave a response of 15-20 CPS in a few hotspots.
- Careys work south of stadium, in small areas in T0011, survey of areas dug gave a response of 500 - 600 CPS.

It should be noted that changes to the survey geometry (as in the cases above) can result in variations to the counts detected.

As such, no areas surveyed so far, have been identified as being likely to contain material that is likely to be subject to radioactive substances legislation. In addition, the radiological risk to workers (and by extension to members of the public) from this work was judged to be negligible.

7 APPENDICES

7.1 Survey Sheet - 2nd April 2014

NUVIA

Radiation & Contamination Survey Report
Health Physics

Date: 2nd APRIL 14

Building: QUEEN ELIZABETH PARK SITE STADIUM

Area Surveyed: AREA N6/N7 DRAIN EXCAVATION (PODIUM LEVEL) (T0011 + T0012)

Area Designation (tick)		Hazard Rating: (H, M, L)		Survey Type (tick)	
Controlled	☐			Routine	☐
Supervised	☐	Radiation	L	Request	☐
Non-Des	☑	Contamination	L	Alarm/Incident	☐
Start Time:	1430			Other	☐
Survey No:	B/B7				☐

Instruments	Serial No.	Pre Test	Bgd*	Post Test
ELECTRA/DP6	2001/1767	☑	α <0.1 β 5cps	☑
ELECTRA/C.HTC	6635/1761	☑	200-300 cps	☑
		☐		☐
		☐		☐
		☐		☐

No	Survey Details	Radiation µSv/h βγ	Radiation γ	Radiation mSv/h η	Contamination CPS α	Contamination CPS βγ	Contamination Bqcm² α	Contamination Bqcm² βγ	P or S♦	R or FM ‡	U/S S or K**
	DUE TO NATURE OF EXCAVATION NO ENTRY TO PIT										
	SPOILS FROM BELOW MARKER LAYER SURVEYED		200-300								S
	BUCKET FROM EXCAVATOR SURVEYED		150-200		<0.1	4			P		S

General Comments: ALL READINGS INCLUDE B/G

Survey completed by Print: [redacted] Sign: [redacted]
HP Supervisor Sign: Date:
RPS or Area Supervisor Sign: Date:

HP Supervisor's Comments:

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NUVIA

Radiation & Contamination Survey Report

Health Physics

Date:	Building:	Area Designation (tick)		Hazard Rating:	Survey Type (tick)		Instruments	Serial No.	Pre Test	Bgd*	Post Test
3rd APRIL 14	QUEEN ELIZABETH PARK SITE STADIUM	Controlled	☐	(H, M, L)	Routine	☐	ELECRA/DP6	2061/17467	☑	~~<0.1 B/G 300 - 350~~	☑
Area Surveyed:		Supervised	☐	Radiation L	Request	☑	ELECTRA/CHRG	6495/1761	☑	200 - 300	☑
AREA N6/N7 DRAIN EXCAVATIONS (PODIUM LEVEL) (T0011)&(T0012)		Non-Des	☑	Contamination L	Alarm/Incident	☐			☐		☐
		Start Time:	0800		Other	☐			☐		☐
		Survey No:	B/B 2			☐			☐		☐

No	Survey Details	Radiation (circle units) µSv/h βγ	Radiation (circle units) CPS or cps γ	Radiation (circle units) mSv/h η	Contamination CPS α	Contamination CPS βγ	Contamination Bqcm² α	Contamination Bqcm² βγ	P or S♦	R or FM ‡	U/S S or K**
	SPOILS FROM MANHOLE EXCAVATION AT N6/N7 SURVEYED		200-300								S
	PITS ENTERED AND AREA SURVEYED (APPROX 4M DEEP)										
	CONCRETE FLOORING FOR SPOTS		200-300								S
			500-600								S
	BUCKETS USED DURING EXCAVATION				<0.1	4cps			P		
	PERSONNEL ENTERING PITS SHOES SURVEYED				<0.1	4cps			P		
	WORKING SURVEY COMPLETED BETWEEN N7 & N6 BEFORE EXCAVATIONS		200-500								S

General Comments: ALL READINGS INCLUDE B/G

Survey completed by Print: [redacted]	Sign: [redacted]	HP Supervisor's Comments:
HP Supervisor Sign:	Date:	
RPS or Area Supervisor Sign:	Date:	

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NUVIA

Radiation & Contamination Survey Report

Health Physics

Date:	Building:
4th APRIL 14	PARK SITE STADIUM

Area Surveyed:
MANHOLES BETWEEN N6 & 7
+ TRENCH TO N8
(T0011 & T0012)

Area Designation (tick)		Hazard Rating:
Controlled	☐	(H, M, L)
Supervised	☐	Radiation L
Non-Des	☑	Contamination L
Start Time:	0800	
Survey No:	RWG B83	

Survey Type (tick)	
Routine	☐
Request	☑
Alarm/Incident	☐
Other	☐

Instruments	Serial No.	Pre Test	Bgd*	Post Test
ELSZRA/N86	2061/1767	☑	<10.1 βSCps	☑
ELSZRA/G-HSG	633/761	☑	200-300 cps	☐
		☐		☐
		☐		☐
		☐		☐

No	Survey Details	Radiation (circle units) µSv/h βγ	cps or γ	mSv/h η	Contamination CPS α	CPS βγ	Bqcm² α	Bqcm² βγ	P or S♦	R or FM ‡	U/S S or K**
	EXCAVATIONS IN ABOVE AREAS. SPOILS MOVED TO LANDRAISE AREA. DUMPERS CHECKED & LANDRAISE AREA AFTER TIPPING.		200-300								S
	EXCAVATOR BUCKETS CHECKED AFTER USE.				<0.1	S			P		S
	PERSONNEL SURVEYED AFTER BIT CHANGES				<0.1	S			P		S

General Comments:
ALL READINGS INCLUDE BK

Survey completed by Print: [redacted]	Sign [redacted]
HP Supervisor Sign:	Date:
RPS or Area Supervisor Sign:	Date:

HP Supervisor's Comments:

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Radiation & Contamination Survey Report

Health Physics

Date: 7 APR 14	Building: O.E. PARK SITE STADIUM	Area Designation (tick)	Hazard Rating:	Survey Type (tick)	Instruments	Serial No.	Pre Test	Bgd*	Post Test
Area Surveyed: TRENCH TO M/H NEAR N8 + MANHOLE (ALREADY DUG ON SAT.) (T0010)		Controlled ☐	(H, M, L)	Routine ☐	ELDRA/DP6	2061/1767	☑	10-14 4cps	☑
		Supervised ☐	Radiation L	Request ☑	ELDRA/CH06	6635/7961	☑	200-300 cps	☑
		Non-Des ☑	Contamination L	Alarm/Incident ☐			☐		☐
		Start Time: 0800		Other ☐			☐		☐
		Survey No: B154		☐			☐		☐

No	Survey Details	Radiation (circle units) µSv/h βγ	cps γ	mSv/h η	Contamination CPS α	CPS βγ	Bqcm² α	Bqcm² βγ	P or S♦	R or FM ‡	U/S S or K**
	SPOILS FROM ABOVE MOVED TO LAYDOWN AREA. SURVEYED		200-300								S
	ENTRY INTO PIT & TRENCH + MANHOLE SURVEYED		200-300 (CHANGEABLE) 700 *								S S
	PERSONNEL WORKING IN TRENCHES CHECKED				<0.1	5cps			P		S
	EXCAVATOR BUCKETS SURVEYED				<0.1	5cps			P		S

General Comments:
ALL READINGS INCLUDE B/G
* FOR SPOTS OF UP TO 700 cps FOUND

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RPS or Area Supervisor Sign:	Date:	

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7.5 Survey Sheet - 8th April 2014

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Radiation & Contamination Survey Report
Health Physics

Date: 8th APRIL 14	Building: QUEEN ELIZABETH PARK SITE STADIUM	Area Designation (tick)	Hazard Rating: (H, M, L)	Survey Type (tick)	
Area Surveyed: MANHOLE AT N9 + TRENCH TOWARDS N10 (T009)		Controlled ☐		Routine ☐	
		Supervised ☐	Radiation L	Request ☑	
		Non-Des ☑	Contamination L	Alarm/Incident ☐	
		Start Time: 0800		Other ☐	
		Survey No: 6/65		☐	

Instruments	Serial No.	Pre Test	Instrument background	Post Test
ELECTRA DP6	2061/1767	☑	<0.1 βγ 5cps	☑
MINI. MON/44B	036745/1045	☑	7-10 cps	☑
ELECTRA C/W 10G	6635/1761	☑	200-300 cps	☒
		☐		☐
		☐		☐

No	Survey Details	Radiation (circle units) µSv/h βγ	cps γ	mSv/h η	Contamination CPS α	CPS βγ	Bq/cm² α	Bq/cm² βγ	P or S♦	R or FM ‡	U/S S or K**
	DUE TO INST FAILURE										
	SURVEYS CARRIED OUT WITH										
	44B										
	SPOILS SURVEYED AS										
	REMOVED BY DUMPER		5-10								S
	COMPREHENSIVE SURVEYS										
	CARRIED OUT OF EXCAVATION		8-12								S
	AREAS										
			15-20	(ON FEW SMALL SPOTS)							S
	PERSONNEL + EXCAVATOR				<0.1	5cps			P		S
	BUCKETS SURVEYED										

General Comments:

Survey completed by Print: [redacted] Sign [redacted]
HP Supervisor Sign: Date
RPS or Area Supervisor Sign: Date:

HP Supervisor's Comments:

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7.6 Survey Sheet - 9th April 2014

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Radiation & Contamination Survey Report

Health Physics

Date:	Building: QUEEN ELIZABETH	Area Designation (tick)		Hazard Rating:	Survey Type (tick)		Instruments	Serial No.	Pre Test	Bgd*	Post Test
9 APRIL 14	PARK S.TE STADIUM	Controlled	☐	(H, M, L)	Routine	☐	ELECTRA D/G	2061/1767	☑	X 0·1 β 4πs	☑
Area Surveyed: PODIUM LEVEL NORTH		Supervised	☐	Radiation L	Request	☑	MINIM / 44B	036745/10445	☑	6 - 8 cps	☑
TRENCH FROM T009 TO T007		Non-Des	☑	Contamination L	Alarm/Incident	☐			☐		☐
		Start Time:	0800		Other	☐			☐		☐
		Survey No:	B/B 6			☐			☐		☐

No	Survey Details	Radiation (circle units) µSv/h βγ	cps (α) γ	mSv/h η	Contamination CPS α	CPS βγ	Bqcm² α	Bqcm² βγ	P or S♦	R or FM ‡	U/S S or K**
	SURVEYS CARRIED OUT WITH 44B										
	EXCAVATING TRENCH BETWEEN T009 TO T007 DUMPERS SURVEYED BEFORE REMOVAL TO LAYDOWN AREA		7-10								S
	NO ACCESS TO THIS PART OF TRENCH - TO BE SURVEYED LATER										
	LAYDOWN AREA SPOIL SURVEYED		7-12								
	EXCAVATOR BUCKET SURVEYED				<0·1	4-5			P		S
	PERSONNEL WORKING IN MINIMS SURVEYED				<0·1	4-5			P		S

General Comments: ALL READINGS IN CPS UNLESS B/G

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RPS or Area Supervisor Sign:	Date:	

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Radiation & Contamination Survey Report

Health Physics

Date:	Building: QUEEN ELIZABETH PARK STADIUM	Area Designation (tick)		Hazard Rating:		Survey Type (tick)		Instruments	Serial No.	Pre Test	Bgd*	Post Test
10 APRIL 14		Controlled	☐	(H, M, L)		Routine	☐	ELECTRA/DP6	2061/1767	☑	x 0.1 βγ cps	☑
Area Surveyed: PODIUM LEVEL TRENCH FROM TOO9 TO TOO7 & CARRYS WORK SOUTH OF STADIUM		Supervised	☐	Radiation	L	Request	☑	MINI/MAN/46	05745/10445	☑	5-7 cps	☑
		Non-Des	☑	Contamination	L	Alarm/Incident	☐	PRM5/XPROBE (3" NAI)	1883/00079	☑	280-320 cps	☑
		Start Time:	0800			Other	☐			☐		☐
		Survey No:	BB7				☐			☐		☐

No	Survey Details	Radiation (circle units) µSv/h βγ	cps γ	mSv/h η	Contamination CPS α	CPS βγ	Bqcm² α	Bqcm² βγ	P or S♦	R or FM ‡	U/S S or K**	General Comments:
	CONTINUATION OF EXCAVATION FROM TOO9 TO TOO7											ALL READINGS INCLUDE BACKGROUND
	DUMPER CONTAINING SPOIL SURVEYED		200-300								S	
	EXCAVATOR BUCKETS & PERSONNEL SURVEYED				<0.1	5 cps			P		S	
	SURVEY OF AREA DUG SO FAR WITH 3" NaI PROBE		250-350 500-600	GENERALLY ON SMALL AREA IN TOO11							S S	
	CARRYS CARRYING ON √ EXCAVATION WORK. SPOIL FROM BELOW MARKER LEVEL SURVEYED		200-300 *								S	* LARGE PILE ALREADY DUG. ONLY SMALL PORTION SURVEYED

Survey completed by Print: [redacted]	Sign: [redacted]	HP Supervisor's Comments:	
HP Supervisor Sign:	Date:		
RPS or Area Supervisor Sign:	Date:		

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7.8 Survey Sheet - 11th April 2014

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Radiation & Contamination Survey Report

Health Physics

Date:	Building: QUEEN ELIZABETH	Area Designation (tick)		Hazard Rating:		Survey Type (tick)		Instruments	Serial No.	Pre Test	Bgd*	Post Test
11 APRIL 14	PARK STADIUM	Controlled	☐	(H, M, L)		Routine	☐	ELECTRA / DP6	200/1767	☑	<0.1 β γ CPS	☑
Area Surveyed: PODIUM LEVEL SPOILS FROM MH "TO12 & TO11		Supervised	☐	Radiation		Request	☑	PCM5/8 PROBE	1883/0079	☑	250 - 300 cB	☑
		Non-Des	☑	Contamination		Alarm/Incident	☐	MINI/MON - 148	031745/1045	☑	5.7 cps	☑
CABEYS HV DIVERSION SOUTH OF STADIUM		Start Time:	0800			Other	☐	MINI RAD 1000	953	☑	<0.1 μSv/h	☑
		Survey No:	S/S 8				☐			☐		☐

No	Survey Details	Radiation (circle units) μSv/h β γ	CPS γ	mSv/h η	Contamination CPS α	CPS βγ	Bqcm² α	Bqcm² βγ	P or S♦	R or FM ‡	U/S S or K**	General Comments:
	SPOILS FROM MANHOLES TO11 & TO12 SURVEYED		200-300								S	ALL READINGS INCLUDE B/G
	EXCAVATOR BUCKETS & PERSONNEL SURVEYED				<0.1	5cps			P		S	
	CABEYS EXCAVATING HV DIVERSION TRENCH, TRENCH SURVEYED		200-350								S	
	SPOILS STOCKPILES SURVEYED		200-300								S	
	2x LORRY LOADS OF SPOILS REMOVED FROM SITE LORRY MONITORING FORMS COMPLETED		250-290								S	

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RPS or Area Supervisor Sign:	Date:	

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Symbol Comments

* Instrument Background

♦ Probe or Smear

** U/S - Unsatisfactory
S - satisfactory
K- Known

‡ R - Removed
FM - Fixed and Marked

7.9 Survey Sheet - 14th April 2014

NUVIA

Radiation & Contamination Survey Report
Health Physics

Date: 14th APRIL 14	Building: QUEEN ELIZABETH PARK STADIUM	Area Designation (tick)	Hazard Rating: (H, M, L)	Survey Type (tick)	Instruments	Serial No.	Pre Test	Instrument background	Post Test
Area Surveyed: CAREYS SPOILS LAYDOWN AREA		Controlled ☐		Routine ☐	ELECTRA/DP6	2061/1767	☑	<0.1 β 5cps	☐
		Supervised ☐	Radiation L	Request ☑	RIMS/γ PROBE	1883/0079	☑	200-280 cps	☐
		Non-Des ☑	Contamination L	Alarm/Incident ☐	MINI/MON 44B	036745/1045	☐	5-7 cps	☐
		Start Time: 0800		Other ☐			☐		☐
		Survey No: 889		☐			☐		☐

No	Survey Details	Radiation (circle units) µSv/h or mSv/h (cps) βγ	γ	η	Contamination CPS α	CPS βγ	Bq/cm² α	Bq/cm² βγ	P or S•	R or FM ‡	U/S S or K**
	SPOILS IN ABOVE AREA SURVEYED FROM WEEKEND EXCAVATIONS		200-350								S
	NO EX.										

General Comments:

ALL READINGS INCLUDE B/G

NO EXCAVATIONS ON PODIUM LEVEL WORK AS LAYING DRAINS & MANHOLES

Survey completed by Print [redacted]	S[redacted]	HP Supervisor's Comments:
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RPS or Area Supervisor Sign:	Date:	

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7.10 Survey Sheet - 15th April 2014

NUVIA

Radiation & Contamination Survey Report

Health Physics

Date: 15 APR 2014	Building: QUEEN ELIZABETH PARK STADIUM	Area Designation (tick): Controlled ☐ Supervised ☐ Non-Des ☑	Hazard Rating (H, M, L): Radiation L; Contamination L	Survey Type (tick): Routine ☐ Request ☑ Alarm/Incident ☐ Other ☐ ☐
Area Surveyed: CAREYS - S.E UNDER PODIUM HV DIVERSION; OKEEFE - SEAST DRAIN EXCAVATION		Start Time: 0800	Survey No: B/B 10	

Instruments	Serial No.	Pre Test	Instrument background	Post Test
ELECTRA/DP6	2001/1767	☐	<0.1 β 5 cps	☑
PCMS/8 PROBE	1883/0079	☐	250-300 cps	☑
MINI/MON/44B	036745/046	☐	4 cps	☑
		☐		☐
		☐		☐

No	Survey Details	Radiation (circle units) µSv/h βγ	CPS γ	mSv/h η	Contamination CPS α	CPS βγ	Bq/cm² α	Bq/cm² βγ	P or S•	R or FM ‡	U/S S or K**
	CAREYS CARRYING OUT HV DIVERSION										
	WORK UNDER MARKER LAYER										
	EXPOSED BUT NOT EXCAVATED.										
	WALKOVER SURVEY OF TRENCH		250-400								S
	EXCAVATOR BUCKETS				<0.1	4			P		S
	O'KEEFE EXCAVATING AROUND		250-300								S
	EXISTING MANHOLE IN										
	S.E CORNER OF SITE										
	(1 DUMPER LOAD)										

General Comments: ALL READINGS INCLUDE B/G.

Survey completed by Print: [redacted] Sign: [redacted]

HP Supervisor Sign: Date:

RPS or Area Supervisor Sign: Date:

HP Supervisor's Comments:

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7.11 Survey Sheet - 16th April 2014

Radiation & Contamination Survey Report
Health Physics

Date: 16 APRIL 2014	Building: QUEEN ELIZABETH PARK STADIUM	Area Designation (tick)	Hazard Rating: (H, M, L)	Survey Type (tick)	Instruments	Serial No.	Pre Test	Instrument background	Post Test
Area Surveyed: CAREYS SPOILS LAYDOWN AREA; O'KEEFE SPOILS LAYDOWN AREA		Controlled ☐		Routine ☐	ELECTRA/DP6	2061/1767	☑	<0.1x 4c cps β	☑
		Supervised ☐	Radiation L	Request ☑	[illegible] 1x PROBE	1883/0079	☑	250 cps	☑
		Non-Des ☑	Contamination L	Alarm/Incident ☐	MINI MON/44B	036745/1044	☑	4 cps	☑
		Start Time: 0800		Other ☐	MINI 680 1000	933	☑	0.1 µSv/h	☑
		Survey No: B/B 11		☐			☐		☐

No	Survey Details	Radiation (circle units) µSv/h βγ	cps γ	mSv/h η	Contamination CPS α	CPS βγ	Bq/cm² α	Bq/cm² βγ	P or S♦	R or FM ‡	U/S S or K**
	CAREYS SPOILS SURVEYED IN LAYDOWN AREA		250-300								S
	2 x LORRIES OF MUCK AWAY		250-280	<0.1 µSv/h							S
	O'KEEFE SPOILS SURVEYED IN LAYDOWN AREA AFTER FURTHER EXCAVATIONS		180-250								S

General Comments: ALL READINGS INCLUDE BACKGROUND

Survey completed by Print: [redacted] Sign: [redacted]
HP Supervisor Sign: Date:
RPS or Area Supervisor Sign: Date:
HP Supervisor's Comments:

DISTRIBUTION – White Prime Copy to Health Physics   Yellow Carbonated Copy Retained by Client

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NUVIA

Radiation & Contamination Survey Report

Health Physics

Date: 17th April 2014	Building: QUEEN ELIZABETH PARK STADIUM	Area Designation (tick)	Hazard Rating: (H, M, L)	Survey Type (tick)	Instruments	Serial No.	Pre Test	Instrument background	Post Test
Area Surveyed: CAREYS LAYDOWN AREA & KEEFE LAYDOWN AREA		Controlled ☐		Routine ☐	ELECTRA / 2216	2061 / 17677	☑	x0.1 Range	☐
		Supervised ☐	Radiation L	Request ☑	PMS / X PROBE	1853 / 0039	☑	260-300	☐
		Non-Des ☑	Contamination L	Alarm/Incident ☐	MINI-MON / 44B	036745 / 1045	☑	5 cps	☐
		Start Time: 0800		Other ☐	MINI RAD 1000	933	☑	0.1 µSv/hr	☐
		Survey No: 6/R 12		☐			☐		☐

No	Survey Details	Radiation (circle units) µSv/h βγ	Radiation (circle units) CPS γ	Radiation (circle units) mSv/h η	Contamination CPS α	Contamination CPS βγ	Contamination Bq/cm² α	Contamination Bq/cm² βγ	P or S+	R or FM ‡	U/S S or K**	General Comments:
												ALL READINGS INCLUDE B/G
	2x LORRIES OF CAREYS SPOILS FROM BELOW MARKER LAMP 4V DIVERSION		260-290								S	
	WALKOVER SURVEY OF ABOVE LAYDOWN AREA		250-320								S	
	KEEFE CARRYING OUT FURTHER EXCAVATIONS IN FAR SOUTHEAST OF ~~EASTERN~~ SITE. SPOILS SURVEYED IN KEEFE LAYDOWN AREA		280-350								S	

Survey completed by Print [redacted]	Sign: [redacted]	HP Supervisor's Comments:
HP Supervisor Sign:	Date:	
RPS or Area Supervisor Sign:	Date:	

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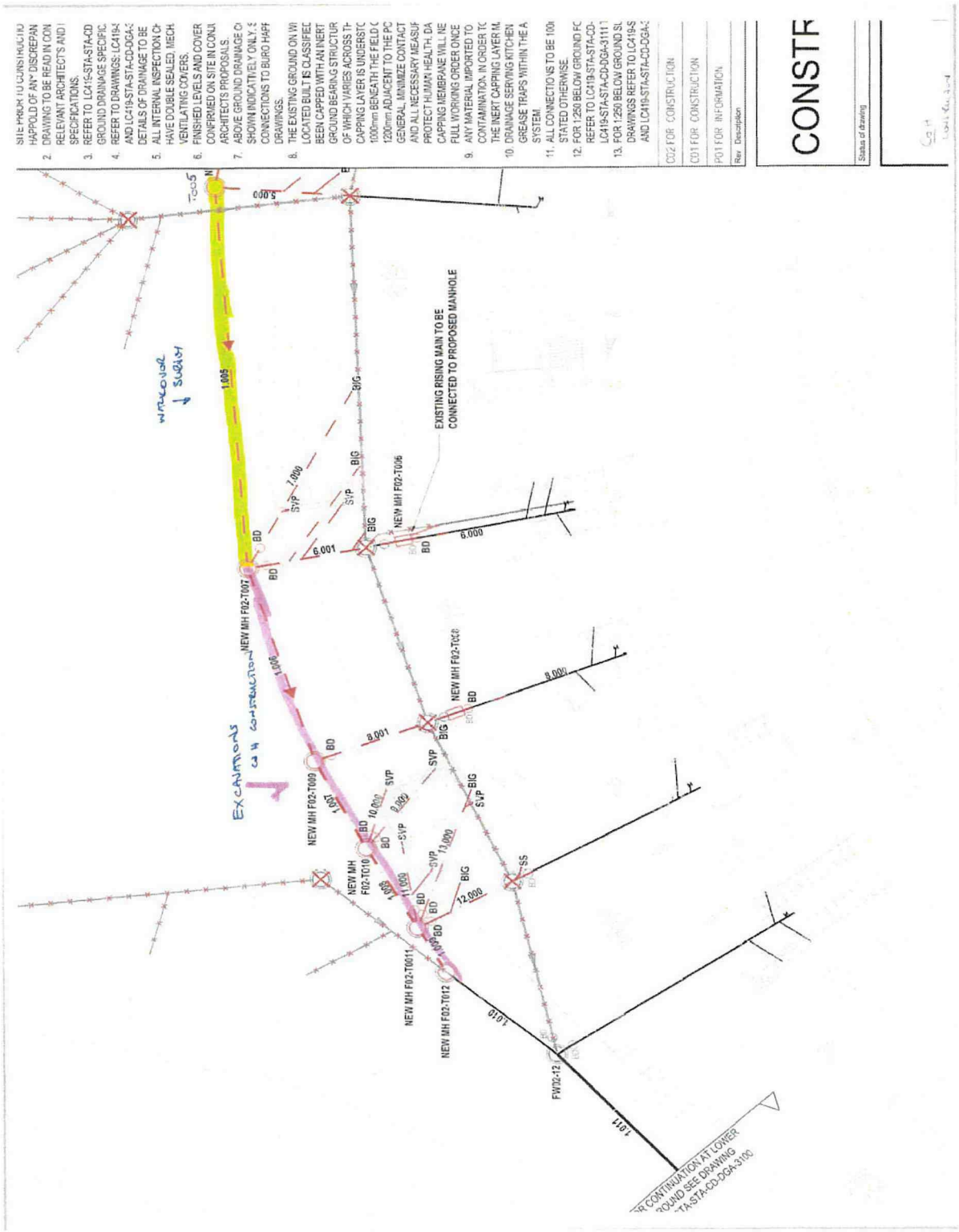
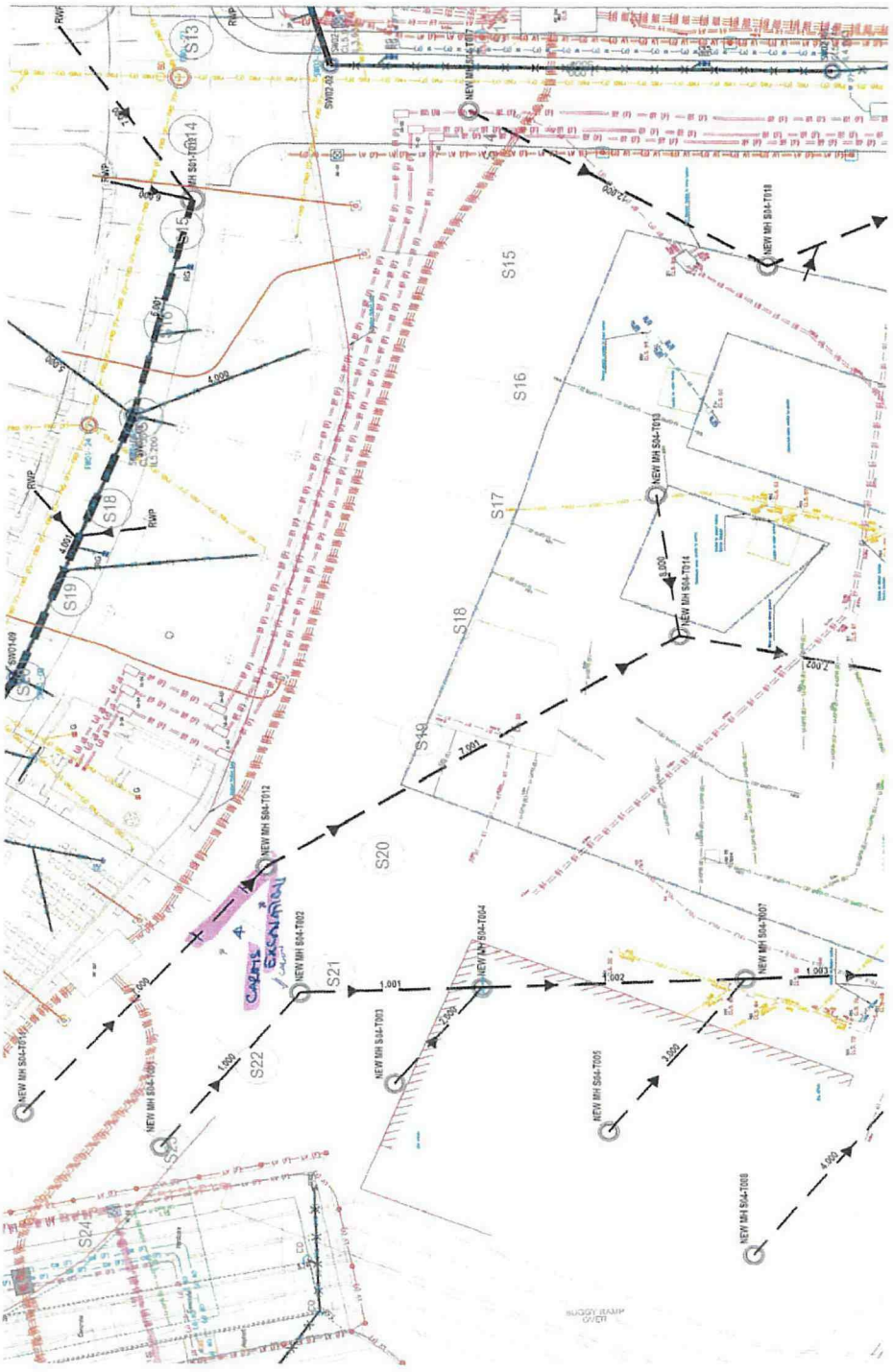
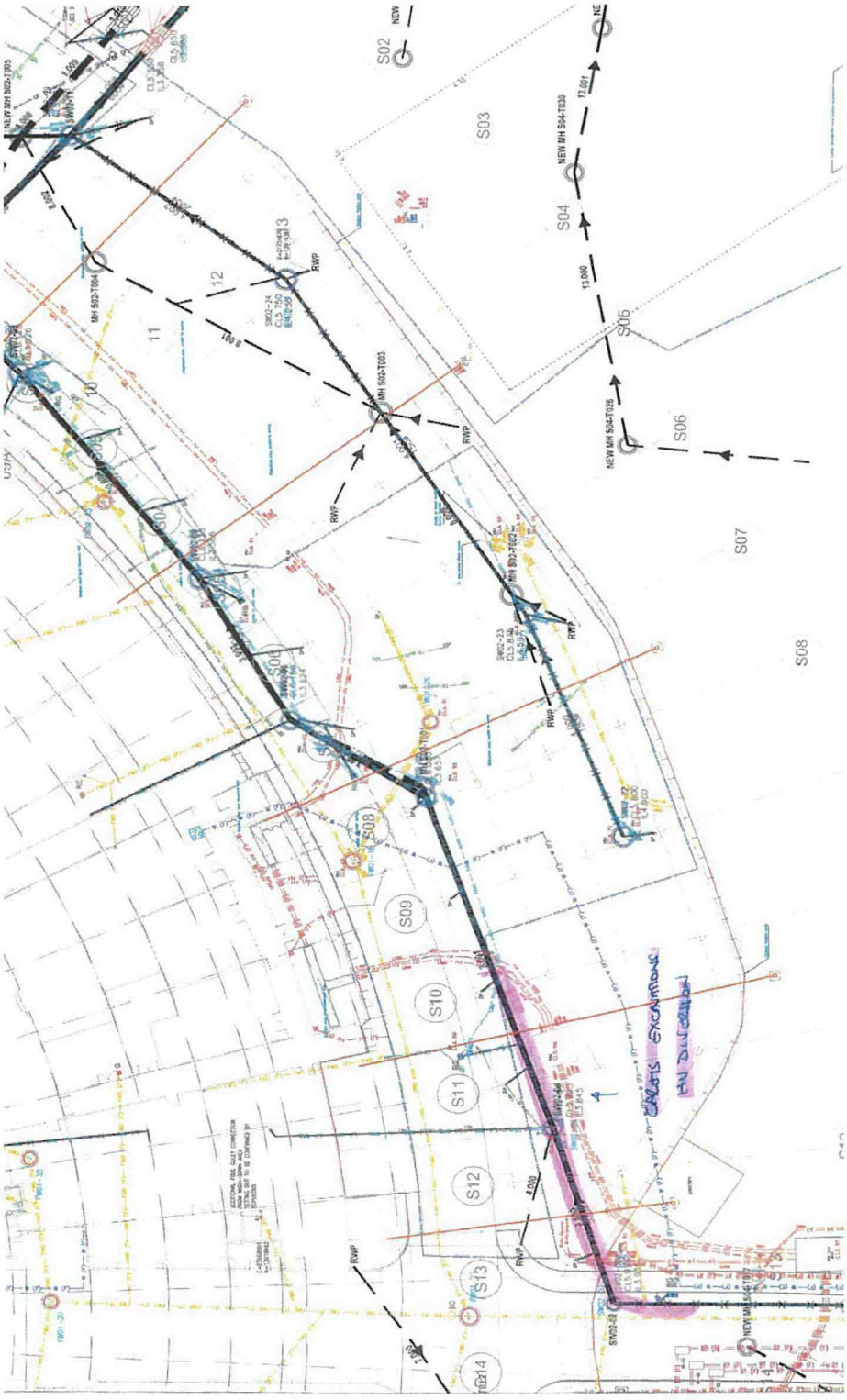
7.13 Areas monitored on site plan – C & H Construction N6 to N10 and T007 to T012



7.14 Areas monitored on site plan – Careys Excavation S21 to S20



7.15 Areas monitored on site plan – Careys Excavation S-10 – S13 and HV Diversion



7.16 Areas monitored on site plan – O'Keefe South East Drain Excavation