

# **Site Investigation Report**

The Old Colliery
Wick Lane
Pensford



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### **Appendices**

Appendix A - Drawing D886/001 Rev. A

Appendix B - Exploratory Hole Logs

Appendix C - Sanctus Chemical Analysis Results (Soil)

Appendix D - Statistical Analysis of Chemical Results (Soil)

Appendix E - Gas Monitoring Results



### 6.0 Contamination Appraisal

Sanctus has reviewed potential contamination issues by undertaking an intrusive investigation.

There were four exceedances of the CLR SGV's for Arsenic at TP01, TP02, TP03, TP12, TP13 and TP14. The concentrations were relatively low and consistent within the soils and would suggest that contaminants are naturally occurring, which is reasonably common in rock formations in the South West of the UK. However, the 95<sup>th</sup> Percentile exceeded the SGV and therefore some form of ground remediation will be necessary to break the potential pollutant pathway with the human end users for the site (intended for development for residential dwellings).

Sanctus identified no other potential contaminants at levels of concern within any of the other samples taken, and so no risk to human health was identified from other potential contaminants.

The identified sources of pollution have been assessed within the conceptual model below, examining the potential pollutant pathways identified to qualify the potential risks that they represent.



**Table 2. Phase 2 Conceptual Model** 

Source	Pathway	Receptor	Significant Pollutant Linkage?
	Dermal contact with soils	Current site occupants, maintenance workers, future site occupants	Yes – Arsenic concentrations with soil samples exceeded the relevant guidelines.
Soil and water	Ingestion of contaminated soil	Current site occupants, maintenance workers, future site occupants	Yes – Arsenic concentrations with soil samples exceeded the relevant guidelines.
contamination associated with former land uses as a Colliery & Precast	Leaching / mobilisation into underlying groundwater	Groundwater and possible onward migration to surface water bodies (Salters Brook)	No – Groundwater was not encountered during the SI and no significant contamination encountered
Concrete Manufacture.	Deterioration of water pipework onsite leading to contamination of Potable water supply	Current site occupants, maintenance workers, future site occupant	No – no significant contamination encountered
	Consumption of home grown fruit and vegetables	Future site occupants	Yes – Arsenic concentrations with soil samples exceeded the relevant guidelines.

Cont...



Soil and water contamination associated with the commercial	Migration of contaminants via ground and surface water on to the subject site	Current site occupants, maintenance workers, future site occupants	No – No groundwater encountered.
vehicle storage, repair and maintenance facility on the adjacent plot directly to the south of the site. Including dismantling and disposal of end of life vehicles.	Migration of soil gas via permeable/fractur ed strata on to the subject site		Possible – ground gas still to be assessed
Historic coal mining activities including railway	Migration of contaminants via ground and surface water on to the subject site.	Current site occupants, maintenance workers, future site occupants	No – No groundwater encountered.
sidings, spoil tips, mine shafts and associated mining buildings, directly surrounding the site. Numerous landfill activities within a 250m radius of the site.	Migration of soil gas via permeable/fractur ed strata on to the subject site		Possible – ground gas still to be assessed

The conceptual model has identified a number of pollutant linkages at the site, which could be significant in relation to the arsenic levels identified at the site. As such, remediation works are recommended to addresses these linkages and protect construction workers and future users of the site.



Remediation options are discussed in Section 7.

The trial pits identified a varying thickness of aesthetically unsuitable made ground from 0.10m to 1.80m bgl. The made ground comprised dark grey coarse-grained sand with ash, clinker and coal in certain areas (TP01, TP03, TP06, TP08, TP09, TP10, TP12, TP13 and TP14) and demolition type waste in other areas (TP02, TP07 and TP11). This material will be unsuitable for aesthetic reasons within garden and landscape areas of the new development.

The investigation and assessment for ground gases found that due to the maximum percentage of Carbon Dioxide being above 5% Characteristic Situation 2 for ground gas protection will be considered, in order for the residential development to incorporate adequate protection measures for the gassing regime present.

Further, from the materials observed and the results of chemical analysis, Sanctus has noted that potentially Inert, Non Hazardous and Hazardous (asbestos sheets on shed roofs) wastes are present on site. Any waste, including soils, should be characterised under current waste legislation before being disposed of. Sanctus can advise on waste characterisation if disposal is necessary.



#### 9.0 Conclusions

Sanctus had been instructed by Tom Smart to investigate the ground conditions at their site, The Old Colliery, Wick Lane, Pensford. BS39 4BU.

Sanctus carried out fourteen trial pits to a maximum depth of 3.20m bgl on the 11<sup>th</sup> November 2009 and obtained soil samples, which were subsequently analysed for contaminants of concern. Monitoring wells to assess the gassing and hydraulic regimes beneath the site were installed on the 8<sup>th</sup> December 2009.

The trial pits identified varying types and thicknesses of made ground at the site. In general the surface 500mm of made ground was composed of dark grey sand with much ash, clinker and coal fragments and several trial pits encountered demolition type waste. Below this, Made Ground comprised colliery spoil (natural reworked mudstones and sandstones) from the historic mining operations. No groundwater was encountered within any of the trial pit excavations.

Chemical analysis returned levels of Arsenic exceeding the Residential SGV, which statistical analysis confirmed to be potentially significant. The analysis results did not identify any other contaminants elevated above the relevant guidance for a residential development scenario.

Therefore, remediation was recommended to break the pollutant pathway, in the form of a capping layer. To implement this, some 600mm of Made Ground will need to be removed from areas proposed for gardens or soft landscaping and either used as engineering fill below 600mm in areas of garden or soft landscaping, or disposal offsite. The capping layer should comprise a geomembrane overlain by suitable subsoil and topsoil (at least 150mm).

The Sanctus ground gas investigation concluded that due to the maximum concentration of Carbon Dioxide being above 5%, within the guidance detailed in CIRIA C665, Characteristic Situation 2 for ground gas protection will be considered,



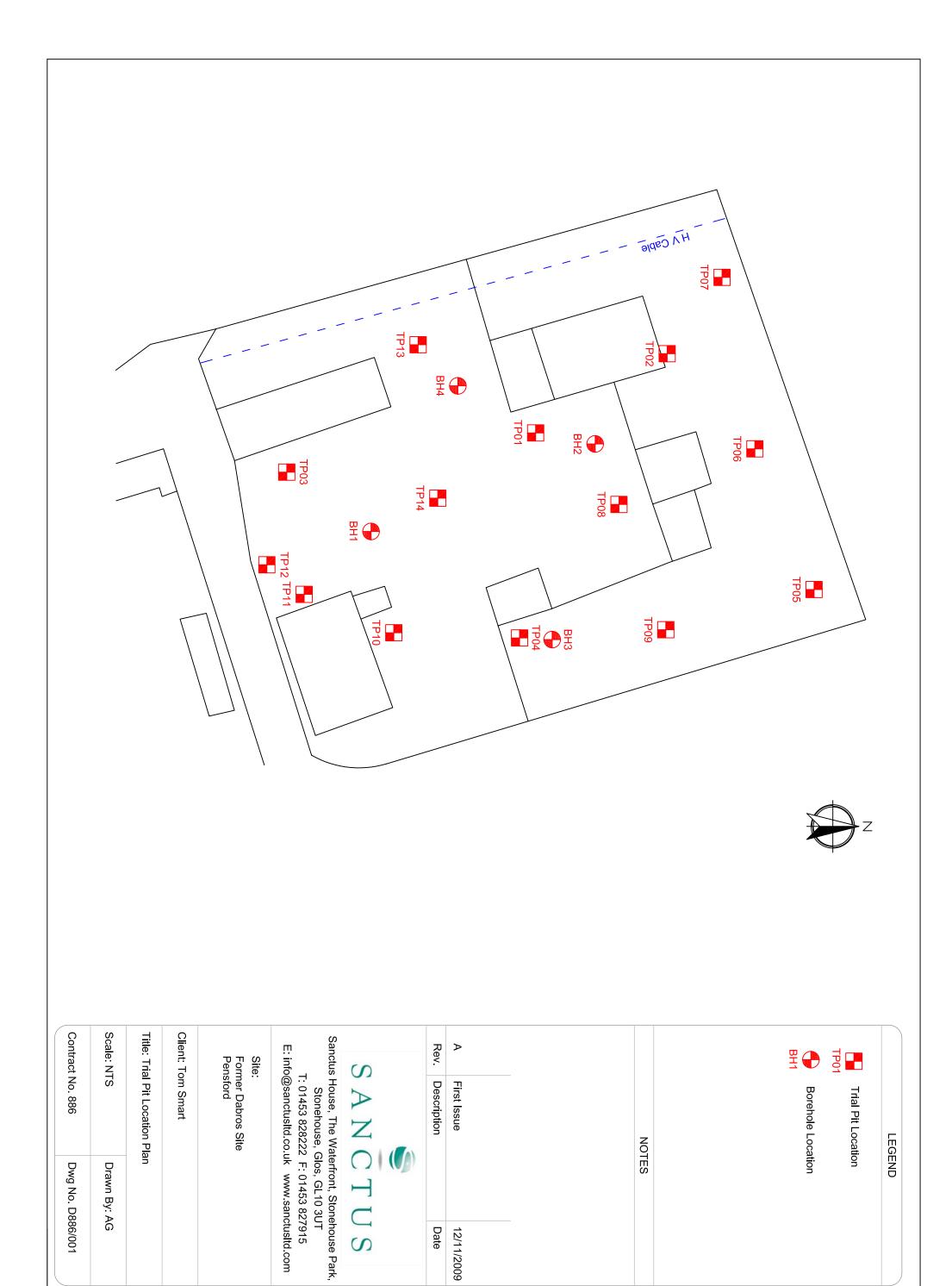
in order for the residential development to incorporate adequate protection measures for the gassing regime present. Further details are found in section 7.2.

A remediation strategy will need to be produced in line with the recommendations made in this report, possibly including ground gas protection measures, and agreed with Bath and North East Somerset Council prior to any remedial works commencing.



### Appendix A

Drawing D886/001 Investigation Location Plan





# Appendix B

Exploratory Hole Logs

SAN	© CTU	S		Borehole No  BH1  Sheet 1 of 1				
Project N	lame		of a val		oject N	lo.	Co-ords: -	Hole Type WS
Location:	Dabros Site, Wick La			30	386		Level: -	Scale 1:50
Client:	Tom Sm			ı	ı		Dates: 08/12/2009	Logged By AW
Well Water Strikes	Sample Depth (m)	<b>s &amp; In</b> Type	Situ Testing Results	Depth (m)	Level (m AOD)		Stratum Des	
		Туре	Results				End of Borehole at	
Remarks:	No groun	dwate	er encountered					(Bid 414.4)
								AGS SEE

SAN	CTU	S			Tel: 014 Fax: 01	s Limited 153828222 453827915 nfo@sanctu	sltd.co.uk		Borehole No BH2 Sheet 1 of 1
Project N				Pr	oject N	0			Hole Type
	abros Site,	Pensf	ord		386	0.	Co-ords: -		ws
Location:							Level: -		Scale 1:50
Client:	Tom Sm						Dates: 08/12/2009		Logged By AW
Well Water Strikes	Samples Depth (m)	s & In S Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum	Description	
	Bopin (in)						End of Boreho		-11 -2 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3
D- :		Туре	Results						(4) Standa
Remarks:	No ground	dwater	encountered						AGS

SAN	S NCTU	S		Sanctus Limited Tel: 01453828222 Fax: 01453827915 email: info@sanctusItd.co.uk							
Project Former	Name Dabros Site	, Pens	sford		oject N 386	0.	Co-ords: -		Hole Type WS		
Location							Level: -		Scale 1:50		
Client:	Tom Sr						Dates: 0	8/12/2009	Logged By AW		
Well Wate Strike	er Sample es Depth (m)	es & In Type	Situ Testing Results	Depth (m)	Level (m AOD)	Legend		Stratum Description	1		
								End of Borehole at 2.25 m	-1 -2 -4 -4 -8		
Remarks	s: No grour	Type ndwate	Results er encountered								
	,								AGS		

SAN	€ CTU	S			Sanctus Tel: 014 Fax: 01 email: ii	Borehole No BH4 Sheet 1 of 1				
Project Na	ame				oject N	0.	Co-ords	· _	Hole Type	1
Former D Location:	abros Site, Wick La			S	386		Level:	-	WS Scale 1:50	
Client:	Tom Sm						Dates:	08/12/2009	Logged By AW	
Well Water Strikes	Sample: Depth (m)	s & In Type	Situ Testing Results	Depth (m)	Level (m AOD)	Legend		Stratum Description		
		Type	Results					End of Borehole at 2.25 m	-1 -1 -3 -3 -5 -5	W 03
Remarks:			er encountered		I					d 414.4) Stē
									AGS	3BASE 3.1 (BI

	3					Sanctus Limited Fel: 01453828222			Trialpit No
	-				F			01	
SA	N C	CTUS			е	email: info@sanctus	ltd.co.uk		Sheet 1 of 1
Project	Nam	е			Proj	ect No.	Co-ords: -		Date
Former	Dabr	os Site, Pensfor	d		S88	36	Level: -		11/11/2009
Location	n: \	Nick Lane, Pens	ford				Dimensions:	2.00m	Scale
							Depth 50		1:25
Client:		Γom Smart	ı				2.30m \( \frac{7}{6}		Logged By AW
Samp Depth (m)	les & Ir Type	Situ Testing Results	Depth (m)	Level (m AOD)	Legend		Stratum	Description	
			0.10	}		Grey angular subb (MADE GROUND)	ase stone with vegetati	on and roots.	
							parse sand with fragme	ents of clinker, ash, coal and	
						occasional brick co (MADE GROUND)	obbles.		
0.50	EW					,			
									-
			1.00			Soft brown sandy (	CLAY with much suban	nular gravel	1
						(CLAY)	DEATT WITH THE CIT SUBULT	guiai gravoi.	
				2					
									-
4.00			4.00						
1.60	ES		1.60	0		Soft brown sandy ( SANDSTONE.	CLAY with much angula	ar gravels and cobbles of weather	red
				0	2	(CLAY)			-
				0					
				9					-2
			2.20		·	Grev/brown coarse	grained SANDSTONE	E with occasional lenses of soft, I	orown
			2.30			CLAY. (SANDSTONE)	9.4	- mar occasional terrore or con, i	/ I
						<u> </u>	Trialpit Comp	olete at 2.30 m	
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									- F
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Remarks	): :								AGS
									AGS
Groundw	ater:								

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Project N				ect No.	Co-ords: - Level: -	Dat	е
Location:	Dabros Site, Pensfor Wick Lane, Pens		S886	<u> </u>	Dimensions: 2.00m	11/11/2 Sca 1:25	le
Client:	Tom Smart				Depth & CO 1.80m CO 1.80m	Logged AW	
	s & In Situ Testing Type Results	Depth Le (m) (m /	evel AOD) Legend		Stratum Description		
		0.10		Disused cast iro	ND)		
1.20	ES	4.00		Grey brown ang lintels and curb reinforcing bar, (MADE GROUN	gular subbase gravel with soil matrix including concrete stones, bricks, concrete, plastic bags, corrugated iron, general demolition material.  ND)		-1
		1.80	-		Trialpit Complete at 1.80 m		-
							-2 - 3 - 4
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						Ļ	, Standard Tr
Remarks:	Trial pit termina	ated on a so	olid concrete	wall/floor at 1.	.8m		G S S S S S S S S S S S S S S S S S S S
Groundwa	ter:					A	HoleBASk

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Project	Name	 9			Proj	ect No. Co-ords: -	Date
		os Site, Pensfor	ď		S88		/11/2009
Location	n: \	Wick Lane, Pens	sford			Dimensions: 3.00m	Scale
						Depth မြ	1:25
Client:		Γom Smart			•		gged By AW
Samp Depth (m)	les & In Type	Situ Testing Results	Depth (m)	Level (m AOD)	Legend	Stratum Description	
			0.10			Grey angular subbase stone with vegetation and roots. (MADE GROUND)	
0.25	ES					Dark grey/black coarse sand with fragments of clinker, ash, coal and occasional brick cobbles. (MADE GROUND)	
			0.50			Soft brown sandy CLAY with much angular gravels and cobbles of weathered SANDSTONE. (MADE GROUND?)	-
1.00	ES		0.80			Red/brown coarse clayey, crumbly SAND with much angular gravels and cobbles SANDSTONE. (MADE GROUND?)	-1
			1.40				-
				Dark grey, coarse SAND. (MADE GROUND?)	-		
			1.80		XXXXX	Grey/brown coarse grained SANDSTONE with occasional lenses of soft, brown	
			2.00			CLÁY. (SANDSTONE)	2
						Trialpit Complete at 2.00 m	-3
Remarks		Two foundation	s found	in initia	l trialoit	so it was excavated perpendicular to these	4) Shandard Triaght Logy 2 dated 27th Nov 03
Remarks	<b>:</b> :	Two foundation	ns found	l in initia	ıl trialpit	so it was excavated perpendicular to these	(BId 414.4)
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Cidallaw	aici.						Hole By

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Colority   Tom Smart				rd		1				Date	
Semple & In   Stu Testing   Depth   (m)   Type   Results   (m)   (m)   AND   Logard   Stratum Description							·-	Dimensions:	3.00m	Scale	
Depth (m)   Type   Reaulta   (m)   m ADD    Legend	Client:	Т	Fom Smart					2.90m 2.90m			1
1.50 ES  1.50 Previous coarse clayer, crumbly SAND with much angular gravets and cobbles SANDS ONE.  SANDS ONE.  SON Express one clayer, crumbly SAND with much angular gravets and cobbles SANDS ONE.  SON Express one clayer, crumbly SAND with much angular gravets and cobbles SANDS ONE.  Son Express one clayer, crumbly SAND with much angular gravets and cobbles SANDS ONE.  Traight Companies at 2.00 m.  Traight Companies at 2.00 m.  2.00  Traight Companies at 2.00 m.  2.00  Traight Companies at 2.00 m.  3.00  Traight Companies at 2.00 m.				Depth (m)	Level (m AOD)	Legend		Stratum [	Description		1
Dark gray, fine grained, faministed MUDSTONE, weak (Celliery spoil).  1.50  Reddrown coarse clayer, crumbly SAND with much angular gravels and codolors (MADS GROUND)  SCHAY with much subangular gravel.  (CLAY)  2.90  Remarks:	,						Grey angular s	subbase stone with vegetation	on and roots.		1
Redirown coarse clayer, crumbly SAND with much angular gravels and cobbles (NADE GROUND)  Soft brown sandy CLAY with much subangular gravel. (CLAY)  2.90  Traipe Complete at 2.50 m  3  Remarks:	150	Fo		150						-1	
Soft brown sandy CLAY with much subangular gravel.  (CLAY)  2 2  4 4  Remarks:	1.50	LS		1.50			SANDSTONE		with much angular gravels	and cobbles	
2.90  Trialpit Complete at 2.90 m  -4				1.75			Soft brown sai		gular gravel.		
Remarks:							(CLAY)			-2	
Remarks:				2.90				Trialpit Compl	ete at 2.90 m	-3	
A C S										-4	andard Trialpit Log v2 dated 27th Nov 03
Groundwater:  AGS  Groundwater:	Remarks	s:		1							(BId 414.4) St
	Groundw	vater:								AGS	HoleBASE 3.1

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Project	Name	<del></del>			Proj	ect No.	Co-ords: -			Date	
		os Site, Pensfor			S88	6	Level: -			11/2009	
Location	n: v	Vick Lane, Pens	stord				Dimensions:	2.00m		Scale 1:25	
							Depth 2.60m			ged By	,
Client:	T	om Smart					2.00111			AW	
Samp Depth (m)	les & In Type	Situ Testing Results	Depth (m)	Level (m AOD)	Legend		Stratum	Description	'		
(···)	. 7/2		, ,		****	Grey angular subb	ase stone with vegeta	tion and roots.			-
0.50	ES		0.20				CLAY with much angul casional fragments of	ar gravels and cobbles of weatl clinker and ash.	hered		-
			1.10								-1
1.20	ES		2.60			Dark grey, fine gra (MADE GROUND?	rey, fine grained, laminated MUDSTONE, weak (Colliery spoil). E GROUND?)				
							maipit oon	plete at 2.60 m			-
											IdeBASE 3.1 (Bld.414.4) Standard Trialpit Log.v.z dated 27th Nov 03
Remarks	<u>                                       </u>										114.4) Stanc
										AGS	3.1 (Bld 4
Groundw	ater:										HoleBAS

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Project	Name	e			Proj	oject No. Co-ords: - Date	
		os Site, Pensfor			S88		
Location	n: \	Vick Lane, Pens	sford			Dimensions: 2.00m Scal	
						Deptin io	
Client:	٦	Tom Smart				2.20m Column Logged AW	l Dy
Samp Depth (m)	les & In Type	Situ Testing Results	Depth (m)	Level (m AOD)	Legend	Stratum Description	
Deptil (III)	туре	Nesuits	0.10	(1117100)	XXXX	Grey angular subbase stone with vegetation and roots. (MADE GROUND)	
			0.10			Dark grey/black coarse sand with fragments of clinker, ash, coal and occasional brick cobbles.	
0.40	ES		0.50			(MADE GROUND)	
			0.50			Dark grey, fine grained, laminated MUDSTONE, weak (Colliery spoil). (MADE GROUND)	-
						(	-
					****		
							-1
1.20	ES		1.20		****		
1.20	ES		1.20			Red/brown coarse clayey, crumbly SAND with much angular gravels and cobbles SANDSTONE	
						(MADE GROUND)	-
							-
							-2
			2.10				
			2.20			CLÁY. (SANDSTONE)	<b>A</b> L
						Trialpit Complete at 2.20 m	-
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							ard Trialp
Remarks							2 2
remains							1 (Bld 414
Groundw	ater:					A	GS SBASE 3.1
							Hole

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Project			Proje S88	ect No.	Co-ords: - Level: -	Date 11/11/2009
Location			300	<u> </u>	Dimensions: 2.00m	Scale 1:25
Client:	Tom Smart				Depth 50 1.40m 0	Logged By AW
Samp Depth (m)	les & In Situ Testing Type Results	Depth (m) (n	Level n AOD) Legend		Stratum Description	
Dopar (III)	Typo	0.10		Grey angular s	subbase stone with vegetation and roots.	
1.00	ES			Grey brown ar	ngular subbase gravel with soil matrix including combstones, bricks, concrete, plastic bags, corrugated i, rubber tyre, general demolition material.	
		1.40	***************************************		Trialpit Complete at 1.40 m	
						-2 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7
						-
						-4
						and Traspit Log v2 dated 277th Nov 03
Remarks	Trial pit te	rminated at 1.4	4m due to con	crete/brick flo	or structure	
Groundw	·					AGS (* PROBLEM )
						İ

Sanctus Limited Tel: 01453828222 Fax: 01453827915									
SANCTU	S	email: info@sanctus	sltd.co.uk	<b>08</b> Sheet 1 of 1					
Project Name Former Dabros Site,		Project No. S886	Co-ords: - Level: -	Date 11/11/2009					
	ne, Pensford		Dimensions: 2.00m	Scale					
				1:25					
Client: Tom Sma			Depth 5.7 1.90m 2.0	Logged By AW					
Samples & In Situ Testin  Depth (m) Type Res		gend	Stratum Description						
	0.10	Grey angular subl (MADE GROUND	pase stone with vegetation and roots.						
0.30 ES 0.50 ES	0.50	occasional brick of (MADE GROUND	e clayey, crumbly SAND with much angular gravels	_					
	1.80			-1					
	1.90	Grey/brown coars CLAY. (SANDSTONE)	e grained SANDSTONE with occasional lenses of	soft, brown  -2  -3					
				AGS					
Remarks: Clay pi	pe observed at 1.0m with a	a solid black crystallin	ne resdiue in pipe	Id 414.4) S					
Groundwater:				AGS 1.(B					

	\$				S	anctus Limited el: 01453828222				pit No
SAI	NI C	TUS			F	ax: 01453827915 mail: info@sanctus	ltd.co.uk			9
										t 1 of 1
Project Former		e os Site, Pensfor	ď		S88	ect No.	Co-ords: - Level: -			ate /2009
Location		Vick Lane, Pens			000	0	Dimensions:	2.00m		cale
							Depth		l l	25
Client:		Tom Smart					3.20m	0.75m	Logg	led By <i>N</i>
Samp Depth (m)	les & In Type	Situ Testing Results	Depth (m)	Level (m AOD)	Legend		Stratu	um Description		
,	71		0.10			Grey angular subb	ase stone with vege	etation and roots.		
								gments of clinker, ash, coal and		
						occasional brick of (MADE GROUND)	obbles.			
			0.50		*****	Dork grov fine gro	inad Iaminatad MIII	DSTONE wook with appaignal a	ool	
0.60	ES				****	fragments (Collier (MADE GROUND)	/ spoil).	DSTONE, weak, with occasional c	Uai	-
						(MADE GROOND)				
					****					-
										-1
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Remarks		Trial pit termina	nea aue	O COIIA	pse					(Bld 414.
Groundw	ater:									AGS 1.6810
2.00110W	۵.01.								-	Ноев

						Sanctus Limited			Tria	lpit No	
					F	el: 01453828222 ax: 01453827915			1	10	
SAI	N C	TUS			е	email: info@sanctus	td.co.uk		Shee	et 1 of 1	
Project	Name	!			Proj	ect No.	Co-ords: -			Date	1
Former	Dabro	s Site, Pensfor	d		S88	6	Level: -		11/1	1/2009	╝
Location	n: V	lick Lane, Pens	ford				Dimensions:	2.00m		cale	
							Depth 52.70			:25	4
Client:		om Smart					1.90m <sup>2</sup> .			ged By .W	
Sampl Depth (m)	Type	Situ Testing Results	Depth (m)	Level (m AOD)	Legend		Stratum I	Description			
. , ,			0.10			Grey angular subba	ase stone with vegetation	on and roots.			
0.40	ES					Dark grey/black co occasional brick co (MADE GROUND?	)	nts of clinker, ash, coal and		-	
			0.80			Soft brown sandy C SANDSTONE. (MADE GROUND?	CLAY with much angula	ar gravels and cobbles of weathe	ered		1
			1.80		XXXX	CANDSTONE					
			1.90		::::::	SANDSTONE (SANDSTONE)	Trialpit Comp				2
										-	Hode BASE 3.1 (Sid 414.4) Standard Trialpit Log v2 dated 27th Nov 03
Remarks	<u>                                     </u>										14.4) Stand:
Groundw									-	AGS	oleBASE 3.1 (Bld 4

			S T	2	Iri	alpit No	
SAN	CTUS		ei	ax: 014538279 mail: info@sand	tusltd.co.uk	She	eet 1 of 1
Project Na			Proje	ect No.	Co-ords: -		Date
Former Da	abros Site, Pensfo		S880	6	Level: -	11/	11/2009
Location:	Wick Lane, Pens	sford			Dimensions: 2.00m		Scale 1:25
Client:	Tom Smart				Depth 5 1.60m 0		gged By AW
	& In Situ Testing /pe Results	Depth L (m) (m	Level Legend		Stratum Description		
Depth (m) 1	rue Results	0.50		Grey brown an lintels, bricks, (MADE GROU	gular subbase gravel with soil matrix including concrete, general demolition material.	concrete	2 2 3 4 4
							, , , , , , , , , , , , , , , , , , ,
Remarks: Groundwate	Trial terminated	d at 0.5m d	due to concre	te obstruction			AGS
							90Н

	3			•	9	Sanctus Limito	ed						7		it No	
C A 1	NI C	TIIC			F	ax: 0145382 mail: info@s	7915	ltd oo uk						12	2	
		TUS					anctus	IIO.CO.UK					S		1 of 1	
Project					1	ect No.		Co-ords: -						Da		
Former Location		os Site, Pensfor Wick Lane, Pens			S886			Level: - Dimensions:			00		1		2009	-
Location	ii. V	Wick Lane, Fens	sioiu						٦	2.00m		Scale 1:25				
Client:	7	Гот Smart						Depth 1.60m	0.75m				L		ed By	
		Situ Testing	Depth	Level	Legend			Strati	ım Da	escription						
Depth (m)	Туре	Results		(m AOD)	XXXXX	Grey angula	ar subb	ase stone with vege								_
			0.10		^^^^	(MADE GR	OUND)									
						matrix with (MADE GR	occasi	and boulders of an onal fragments of c	linker	and ash.	JNE IN a	coarse g	gravei		-	
			0.50													
			0.50			SANDSTO	NE.	CLAY with much an	gular	gravels an	d cobble	s of weat	thered			
						(MADE GR	OUND)								-	
1.00	ES														-	-1
															-	
															-	
			1.50		<b>****</b>											
			1.60			CLAY.		grained SANDSTO	ONE v	vith occasi	onal lens	es of so	ft, brown	l	1	
						\((SANDSTO	INE)	Trialpit C	Complet	te at 1.60 m					/	
															-	
																-2
															-	
															-	
															-	
															-	
															-	
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																-3
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															-	
																-4
															-	
															-	
																Nov 03
															-	ated 27th
															-	:Log v2 d
																rd Trialpit
Domonico															-	.4) Standa
Remarks															GS	ldeBASE 3.1 (Bld 414.4) Standard
Groundw	ater:													1		HoleBAS

				Sanctus Limited el: 0145382822		Trialpit No
SAI	NCTUS		F	ax: 014538279 mail: info@san	15	13
						Sheet 1 of 1
Project				ect No.	Co-ords: - Level: -	Date 11/11/2009
Location	Dabros Site, Pensfer: Wick Lane, Pe		S88	90		Scale
Location	i. Wick Laile, Fe	isioiu				1:25
Client:	Tom Smart				Depth 5.3.10m 2.3	Logged By AW
	les & In Situ Testing	Depth	Level (m AOD) Legend		Stratum Description	
Depth (m)	Type Results		(m AOD) Legend	Grey angular s	subbase stone with vegetation and roots.	
		0.10	^^^	(MADE GROL	IND)	
1.50	ES	1.80		(MADE GROL	arse clayey, crumbly SAND with much angular gra	-1
		2.80		Soft brown sai (CLAY)	ndy CLAY with much subangular gravel.  Trialpit Complete at 3.10 m	AGS (BIOLEGE) Canada Traight Log 2 dated 27th Nov. 03
Remarks	:	1				d414.4) Si
Groundw	ater.					AGS IS
Croundw	a.o					HoleB

Sanctus Limited Tel: 01453828222	Trialpit No
SANCTUS  Fax: 01453827915 email: info@sanctusltd.co.uk	14 Short 4 of 4
Project Name Project No. Co-ords: -	Sheet 1 of 1  Date
Former Dabros Site, Pensford S886 Level: -	11/11/2009
Location: Wick Lane, Pensford  Dimensions: 2.00m  Depth	Scale 1:25
Client: Tom Smart  Depth 5 3.00m 7	Logged By AW
Samples & In Situ Testing Depth (m) Type Results Depth (m) AOD Legend Stratum Description	
Depth (m) Type Results (m) (m AOD) Legend Stratum Description  O.10 Grey angular subbase stone with vegetation and roots. (MADE GROUND)	
Dark grey/black coarse sand with fragments of clinker, ash, coal occasional brick cobbles. (MADE GROUND)  Red/brown coarse clayey, crumbly SAND with much angular grav SANDSTONE (MADE GROUND)  0.90 ES	
2.90 3.00  Grey/brown coarse grained SANDSTONE with occasional lenses CLAY. (SANDSTONE)  Trialpit Complete at 3.00 m	s of soft, brown
	AGS 18 BY
Groundwater:	A Soliton Property of the Parket Property of



# Appendix C

Chemical Analysis Results (Soil)



Depot Road Newmarket CB8 0AL Tel: 01638 606070

Sanctus Limited Sanctus House Stonehouse Park Stonehouse, Glos **GL10 3UT** 

**FAO Alexa Gray** 19 November 2009

Dear Alexa Gray

**Test Report Number** 

97743

Your Project Reference

Former Dabios Site, Pensford - SL886

Please find enclosed the results of analysis for the samples received 13 November 2009.

All soil samples will be retained for a period of one month and all water samples will be retained for 7 days following the date of the test report. Should you require an extended retention period then please detail your requirements in an email to customerservices@chemtest.co.uk. Please be aware that charges may be applicable for extended sample storage.

If you require any further assistance, please do not hesitate to contact the Customer Services team.

Yours sincerely

Authorised Signatory

Darrell Hall

□ Phil Hellier **Operations Director** □ Keith Jones

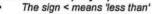
□ John Crawford □ Malcolm Avis

**Technical Development Manager** Quality Manager

Laboratory Manager

**Technical Director** 

Notes to accompany report:



- Tests marked 'U' hold UKAS accreditation
- Tests marked 'M' hold MCertS (and UKAS) accreditation Tests marked 'N' do not currently hold UKAS accreditation
- Tests marked 'S' were subcontracted to an approved laboratory
- n/e means 'not evaluated'
- i/s means 'insufficient sample
- u/s means 'unsuitable sample'
- Comments or interpretations are outside of the scope of UKAS accreditation
- The results relate only to the items tested
- Stones represent the quantity of material removed prior to analysis
- All results are expressed on a dry weight basis
- The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, phenois
- For all other tests the samples were dried at < 37°C prior to analysis
- Uncertainties of measurement for the determinands tested are available upon request
- Soil descriptions, including colour and texture, are beyond the scope of MCertS accreditation

Test Report 97743 Cover Sheet

FAO Alexa Gray

# LABORATORY TEST REPORT



Report Date
19 November 2009

Results of analysis of 11 samples received 13 November 2009

Former Dabios Site, Pensford - SL886

Login E	Batch No							97	743			
Chemte	est LIMS ID				AE47489	AE47491	AE47493	AE47494	AE47498	AE47499	AE47500	AE47502
Sample	ID				TP01	TP02	TP03	TP04	TP06	TP07	TP08	TP09
Sample	• No											
Samplii	ng Date				11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009
Depth					0.5m	1.2m	1m	1.5m	1.2m	1m	0.3m	0.6m
Matrix					SOIL							
SOP↓	Determinand↓	CAS No↓	Units↓	*								
2120	Boron (hot water soluble)	7440428	mg kg-1	М	0.8	1.7	1.2	2.2	1.6		1.3	2.2
	Sulfate (2:1 water soluble) as SO4	14808798	g l-¹	М	0.28	0.90	0.10	0.14	0.14		0.11	1.4
2175	Sulfur (total TRL report 447)		%	N	0.53	0.39	0.58	0.06	0.20		0.03	0.25
2300	Cyanide (free)	57125	mg kg-1	М	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50
	Cyanide (total)	57125	mg kg-1	М	<0.50	<0.50	<0.50	<0.50	<0.50		<0.50	<0.50
2430	Sulfate (total) by BS1377 (HCl extract)	14808798	%	N	0.65	0.45	0.50	0.08	0.29		0.05	0.25
2450	Arsenic	7440382	mg kg-1	М	35	58	62	27	25		29	16
	Cadmium	7440439	mg kg-1	М	0.31	2.4	0.22	0.81	0.13		0.83	0.19
	Chromium	7440473	mg kg-1	М	18	36	29	12	14		18	9.9
	Copper	7440508	mg kg-1	М	77	56	17	37	9.1		40	24
	Mercury	7439976	mg kg-1	М	0.10	0.12	0.36	0.46	0.15		0.23	0.25
	Nickel	7440020	mg kg-1	М	120	66	19	52	17		30	12
	Lead	7439921	mg kg-1	М	31	100	41	410	30		100	36
	Selenium	7782492	mg kg-1	М	<0.20	<0.20	1.6	0.27	0.52		<0.20	0.58
	Zinc	7440666	mg kg-1	М	81	800	35	160	51		120	54
2490	Chromium (hexavalent)	18540299	mg kg-1	N	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5
2675	TPH aliphatic >C5-C6		mg kg-1	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
	TPH aliphatic >C6-C8		mg kg-1	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
	TPH aliphatic >C8-C10		mg kg-1	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
	TPH aliphatic >C10-C12		mg kg-1	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		0.9	< 0.1
	TPH aliphatic >C12-C16		mg kg-1	N	< 0.1	2.1	< 0.1	< 0.1	< 0.1		7.6	< 0.1
	TPH aliphatic >C16-C21		mg kg-1	N	< 0.1	57	< 0.1	< 0.1	< 0.1		36	< 0.1
	TPH aliphatic >C21-C35		mg kg-1	N	< 0.1	130	< 0.1	< 0.1	< 0.1		90	< 0.1
	TPH aromatic >C5-C7		mg kg-1	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
	TPH aromatic >C7-C8		mg kg-1	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
	TPH aromatic >C8-C10		mg kg-1	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1
	TPH aromatic >C10-C12		mg kg-1	N	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		4.4	< 0.1
	TPH aromatic >C12-C16		mg kg-1	N	1.9	0.7	< 0.1	< 0.1	< 0.1		11	< 0.1
	TPH aromatic >C16-C21		mg kg-1	N	3.8	2.9	< 0.1	< 0.1	< 0.1		7.8	< 0.1

All tests undertaken between 13-Nov-2009 and 19-Nov-2009

<sup>\*</sup> Accreditation status

FAO Alexa Gray

# LABORATORY TEST REPORT



Results of analysis of 11 samples received 13 November 2009

Former Dabios Site, Pensford - SL886

Report Date
19 November 2009

	Batch No					97743	
Chemt	test LIMS ID				AE47504	AE47505	AE47506
ample	e ID				TP12	TP13	TP14
Sample	e No						
Sampli	ing Date				11/11/2009	11/11/2009	11/11/2009
Depth					1m	1.5m	0.9m
Иatrix					SOIL	SOIL	SOIL
SOP↓	Determinand↓	CAS No↓	Units↓				
2120	Boron (hot water soluble)	7440428	mg kg-1	M	0.7	1.3	0.8
	Sulfate (2:1 water soluble) as SO4	14808798	g l-¹	M	0.07	0.23	0.23
2175	Sulfur (total TRL report 447)		%	N	0.76	0.15	0.30
2300	Cyanide (free)	57125	mg kg-1	M	<0.50	<0.50	<0.50
	Cyanide (total)	57125	mg kg-1	М	<0.50	<0.50	<0.50
2430	Sulfate (total) by BS1377 (HCl extract)	14808798	%	N	0.80	0.13	0.32
2450	Arsenic	7440382	mg kg-1	М	57	58	42
	Cadmium	7440439	mg kg-1	М	0.50	0.60	0.17
	Chromium	7440473	mg kg-1	М	46	19	20
C	Copper	7440508	mg kg-1	М	20	68	15
	Mercury	7439976	mg kg-1	М	0.19	0.52	0.33
	Nickel	7440020	mg kg-1	М	27	62	20
	Lead	7439921	mg kg-1	М	66	110	40
	Selenium	7782492	mg kg-1	М	1.8	0.24	2.0
	Zinc	7440666	mg kg-1	М	94	110	35
2490	Chromium (hexavalent)	18540299	mg kg-1	N	<0.5	<0.5	<0.5
2675	TPH aliphatic >C5-C6		mg kg-1	N	< 0.1	< 0.1	< 0.1
	TPH aliphatic >C6-C8		mg kg-1	N	< 0.1	< 0.1	< 0.1
	TPH aliphatic >C8-C10		mg kg-1	N	< 0.1	< 0.1	< 0.1
	TPH aliphatic >C10-C12		mg kg-1	N	< 0.1	< 0.1	< 0.1
	TPH aliphatic >C12-C16		mg kg-1	N	< 0.1	< 0.1	< 0.1
	TPH aliphatic >C16-C21		mg kg-1	N	< 0.1	< 0.1	< 0.1
	TPH aliphatic >C21-C35		mg kg-1	N	< 0.1	< 0.1	< 0.1
	TPH aromatic >C5-C7		mg kg-1	N	< 0.1	< 0.1	< 0.1
	TPH aromatic >C7-C8		mg kg-1	N	< 0.1	< 0.1	< 0.1
	TPH aromatic >C8-C10		mg kg-1	N	< 0.1	< 0.1	< 0.1
	TPH aromatic >C10-C12		mg kg-1	N	< 0.1	< 0.1	< 0.1
	TPH aromatic >C12-C16		mg kg-1	N	0.7	1.5	< 0.1
	TPH aromatic >C16-C21		mg kg-1	N	1.5	1.2	< 0.1

FAO Alexa Gray

# LABORATORY TEST REPORT



Report Date
19 November 2009

Results of analysis of 11 samples received 13 November 2009

Former Dabios Site, Pensford - SL886

								97	743	97743										
					AE47489	AE47491	AE47493	AE47494	AE47498	AE47499	AE47500	AE47502								
					TP01	TP02	TP03	TP04	TP06	TP07	TP08	TP09								
					11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009	11/11/2009								
					0.5m	1.2m	1m	1.5m	1.2m	1m	0.3m	0.6m								
					SOIL															
2675	TPH aromatic >C21-C35		mg kg-1	N	2.0	4.0	< 0.1	< 0.1	< 0.1		150	< 0.1								
	Total Petroleum Hydrocarbons		mg kg-1	N	< 10	200	< 10	< 10	< 10		310	< 10								
2700	Naphthalene	91203	mg kg-1	M	0.18	0.11	< 0.1	< 0.1	< 0.1		0.1	< 0.1								
	Acenaphthylene	208968	mg kg-1	M	0.75	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1								
	Acenaphthene	83329	mg kg-1	M	1.1	< 0.1	< 0.1	0.17	< 0.1		0.21	< 0.1								
	Fluorene	86737	mg kg-1	M	1.9	0.25	< 0.1	< 0.1	< 0.1		0.25	< 0.1								
	Phenanthrene	85018	mg kg-1	М	3	1.1	0.15	0.48	0.12		2	0.51								
	Anthracene	120127	mg kg-1	М	0.18	< 0.1	< 0.1	< 0.1	< 0.1		0.15	< 0.1								
	Fluoranthene	206440	mg kg-1	М	0.85	0.53	< 0.1	< 0.1	< 0.1		0.96	0.1								
	Pyrene	129000	mg kg-1	М	0.8	1.1	< 0.1	< 0.1	0.13		1	0.35								
	Benzo[a]anthracene	56553	mg kg-1	М	0.25	< 0.1	< 0.1	< 0.1	< 0.1		0.44	< 0.1								
	Chrysene	218019	mg kg-1	М	1.4	0.21	< 0.1	< 0.1	< 0.1		1	< 0.1								
	Benzo[b]fluoranthene	205992	mg kg-1	М	0.18	0.42	< 0.1	< 0.1	< 0.1		0.76	< 0.1								
	Benzo[k]fluoranthene	207089	mg kg-1	М	0.2	0.13	< 0.1	< 0.1	< 0.1		0.16	< 0.1								
	Benzo[a]pyrene	50328	mg kg-1	М	0.16	0.21	< 0.1	< 0.1	< 0.1		0.73	< 0.1								
	Dibenzo[a,h]anthracene	53703	mg kg-1	М	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1								
	Indeno[1,2,3-cd]pyrene	193395	mg kg-1	М	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		0.25	< 0.1								
	Benzo[g,h,i]perylene	191242	mg kg-1	М	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1		0.29	< 0.1								
	Total (of 16) PAHs		mg kg-1	М	11	4.1	< 2	< 2	< 2		8.3	< 2								
2920	Phenols (total)		mg kg-1	N	<0.3	<0.3	<0.3	<0.3	<0.3		<0.3	<0.3								
2010	рН		-	М	8.3	8.0	7.5	8.1	7.7		8.1	6.0								
	Moisture		%	n/a	20.2	22.2	16.5	8.51	13		14.7	14.3								
	Stones content (>50mm)		%	n/a	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02								
2140	Soil colour			n/a	black	brown	brown	brown	brown		brown	brown								
	Soil texture			n/a	sand	sand	sand	sand	sand		sand	clay								
	Other material			n/a	stones	stones	stones	slate	stones		stones	slate								
2186	Asbestos Containing Material		_	N	not found															

All tests undertaken between 13-Nov-2009 and 19-Nov-2009

FAO Alexa Gray

# LABORATORY TEST REPORT



Results of analysis of 11 samples received 13 November 2009

Former Dabios Site, Pensford - SL886

Report Date 19 November 2009

						97743	
					AE47504	AE47505	AE47506
					TP12	TP13	TP14
					11/11/2009	11/11/2009	11/11/2009
					1m	1.5m	0.9m
					SOIL	SOIL	SOIL
2675	TPH aromatic >C21-C35		mg kg-1	N	0.9	1.2	< 0.1
	Total Petroleum Hydrocarbons		mg kg-1	N	< 10	< 10	< 10
2700	Naphthalene	91203	mg kg-1	М	< 0.1	< 0.1	< 0.1
	Acenaphthylene	208968	mg kg-1	М	< 0.1	0.13	< 0.1
	Acenaphthene	83329	mg kg-1	М	< 0.1	0.17	< 0.1
	Fluorene	86737	mg kg-1	М	< 0.1	< 0.1	< 0.1
	Phenanthrene	85018	mg kg-1	М	0.67	1.1	0.21
	Anthracene	120127	mg kg-1	М	< 0.1	< 0.1	< 0.1
	Fluoranthene	206440	mg kg-1	М	0.36	0.4	0.13
	Pyrene	129000	mg kg-1	М	0.48	0.12	0.12
	Benzo[a]anthracene	56553	mg kg-1	М	0.2	0.21	< 0.1
	Chrysene	218019	mg kg-1	М	0.47	0.65	< 0.1
	Benzo[b]fluoranthene	205992	mg kg-1	М	< 0.1	0.11	< 0.1
	Benzo[k]fluoranthene	207089	mg kg-1	М	< 0.1	< 0.1	< 0.1
	Benzo[a]pyrene	50328	mg kg-1	М	< 0.1	0.11	< 0.1
	Dibenzo[a,h]anthracene	53703	mg kg-1	М	< 0.1	< 0.1	< 0.1
	Indeno[1,2,3-cd]pyrene	193395	mg kg-1	М	< 0.1	< 0.1	< 0.1
	Benzo[g,h,i]perylene	191242	mg kg-1	М	< 0.1	< 0.1	< 0.1
	Total (of 16) PAHs		mg kg-1	М	2.2	3	< 2
2920	Phenols (total)		mg kg-1	N	<0.3	<0.3	<0.3
2010	рН		-	М	7.3	7.7	6.2
2030	Moisture		%	n/a	15.9	19.3	14.8
	Stones content (>50mm)		%	n/a	<0.02	<0.02	<0.02
2140	Soil colour			n/a	brown	brown	brown
	Soil texture			n/a	sand	sand	sand
	Other material			n/a	stones	stones	stones
2186	Asbestos Containing Material		-	N	not found	not found	not found



# Appendix D

Statistical Analysis



Site: Dabro, Pensford

			Con	taminant Con	centration (mo	g/kg)	
		Contam 1	Contam 2	Contam 3	Contam 4	Contam 5	Contam 6
Sample ID	Depth (m)	Arsenic					
TP01	0.5	35.00					
TP02	1.2	58.00					
TP03	1.0	62.00					
TP04	1.5	27.00					
TP06	1.2	25.00					
TP08	0.3	29.00					
TP09	0.6	16.00					
TP12	0.6	57.00					
TP13	0.5	58.00					
TP14	0.9	42.00					
max value test							
max y		1.79239169	0	0	0	0	0
mean y		1.57382616	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
standard deviation y		0.19901672	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
T=		1.09822697	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Tcrit=		2.18	#N/A	#N/A	#N/A	#N/A	#N/A
Any Outliers?		No Outliers	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Action?		None	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
mean value test							
mean x		40.90	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
standard deviation x		16.7759749	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
t		1.833	#N/A	#N/A	#N/A	#N/A	#N/A
number, n		10	0	0	0	0	0
square root of n		3.16227766	0	0	0	0	0
US95		50.6241183	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Notes:
It is recommended that at least 5-samples are required to perform a suitable mean value test
A maximum of 50-samples can be inputted into the table
Maximum values are returned in bold



# Appendix E

**Ground Gas Monitoring Results** 



Weather: Co	old and Su	nny, frozen gi	round			
Atmospheric	Pressure	: 1004mb,	Groundwater: D	ry, Base of	Borehole: n	n bgl.
Equipment L	Jsed: GA2	2000 Landfill G	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
18/12/2009	BH01	0	0.0	0.0	21.3	-0.1 to + 0.1
		+1	0.0	0.1	21.2	
		+2	0.0	0.1	21.1	
		+3	0.0	0.1	21.2	
		+4	0.0	0.1	21.3	
		+5	0.0	0.1	21.2	
		+8	0.0	0.1	21.3	
		+10	0.0	0.1	21.3	
		+13	0.0	0.1	21.3	
		<b>±</b> 15	0.0	0.1	21.4	

Weather: Co	old and Su	nny, frozen gi	round			
Atmospheric	Pressure	: 1004mb,	Groundwater: Dr	y, Base of	Borehole: ı	m bgl.
Equipment U	Jsed: GA2	2000 Landfill C	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
18/12/2009	BH02	0	0.0	0.0	21.3	-0.1 to + 0.1
		+1	0.0	0.8	20.3	
		+2	0.0	0.8	20.4	
		+3	0.0	0.8	20.4	
		+4	0.0	0.8	20.3	
		+5	0.0	0.8	20.3	
		+8	0.0	0.8	20.3	
		+10	0.0	0.8	20.3	
		+13	0.0	0.8	20.3	
		+15	0.0	0.8	20.3	

14/ // 0		,				
		nny, frozen gi				
Atmospheric	Pressure	: 1004mb,	Groundwater: Dr	y, Base of	Borehole: r	m bgl.
Equipment U	Jsed: GA2	2000 Landfill C	Sas Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
18/12/2009	BH03	0	0.0	0.0	21.3	-0.1 to + 0.1
		+1	0.0	0.2	21.3	
		+2	0.0	0.2	21.3	
		+3	0.0	0.2	21.3	
		+4	0.0	0.2	21.3	
		+5	0.0	0.1	21.3	
		+8	0.0	0.1	21.2	
		+10	0.0	0.1	21.3	
		+13	0.0	0.1	21.3	
		+15	0.0	0.1	21.2	

Weather: Co	old and Su	nny, frozen gi	round			
Atmospheric	Pressure	: 1004mb,	Groundwater: Dr	y, Base of	Borehole: r	m bgl.
Equipment L	Jsed: GA2	2000 Landfill C	as Analyser	•		
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
18/12/2009	BH04	0	0.0	0.0	21.3	-0.1 to + 0.1
		+1	0.0	0.6	20.6	
		+2	0.0	0.6	20.6	
		+3	0.0	0.6	20.6	
		+4	0.0	0.6	20.6	
		+5	0.0	0.6	20.6	
		+8	0.0	0.6	20.6	
		+10	0.0	0.6	20.6	
		+13	0.0	0.6	20.6	
		+15	0.0	0.6	20.6	



Weather: Ov	ercast, fro	zen ground				
Atmospheric	Pressure	: 992mb, G	roundwater: Dry	, Base of E	Borehole: m	bgl.
Equipment (	Jsed: GA2	2000 Landfill G	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
21/01/2010	BH01	0	0.0	0.0	21.3	-0.1 to + 0.1
		+1	0.0	0.1	21.2	
		+2	0.0	0.1	21.1	
		+3	0.0	0.2	21.1	
		+4	0.0	0.2	21.1	
		+5	0.0	0.2	21.1	
		+8	0.0	0.2	21.1	
		+10	0.0	0.2	21.1	
		+13	0.0	0.2	21.1	
		+15	0.0	0.2	21.1	

Atmospheric	Pressure	: 992mb, G	roundwater: Dry	, Base of E	Borehole: m	bgl.
Equipment l	Jsed: GA2	2000 Landfill G	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
21/01/2010	BH02	0	0.0	0.0	21.3	-0.1 to + 0.1
		+1	0.0	0.8	20.3	
		+2	0.0	0.9	20.3	
		+3	0.0	0.9	20.2	
		+4	0.0	0.9	20.2	
		+5	0.0	0.9	20.2	
		+8	0.0	0.9	20.2	
		+10	0.0	0.9	20.2	
		+13	0.0	0.9	20.2	
		+15	0.0	0.9	20.2	

Atmospheric		zen ground : 992mb. G	roundwater: Dry	. Base of E	Borehole: m	bal.
Equipment l	Jsed: GA2	2000 Landfill G	as Analyser	<u></u>		•
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
21/01/2010	BH03	0	0.0	0.0	21.3	-0.1 to + 0.1
		+1	0.0	0.2	21.2	
		+2	0.0	0.2	21.2	
		+3	0.0	0.2	21.2	
		+4	0.0	0.2	21.2	
		+5	0.0	0.2	21.2	
		+8	0.0	0.2	21.2	
		+10	0.0	0.2	21.2	
		+13	0.0	0.2	21.2	
		+15	0.0	0.2	21.2	

Weather: Ov	ercast, fro	zen ground				
Atmospheric	Pressure	: 992mb, G	roundwater: Dry	, Base of E	Borehole: m	bgl.
Equipment L	Jsed: GA2	2000 Landfill G	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
21/01/2010	BH04	0	0.0	0.5	21.3	-0.1 to + 0.1
		+1	0.0	0.6	20.6	
		+2	0.0	0.6	20.6	
		+3	0.0	0.6	20.6	
		+4	0.0	0.7	20.6	
		+5	0.0	0.7	20.6	
		+8	0.0	0.7	20.6	
		+10	0.0	0.6	20.6	
		+13	0.0	0.6	20.6	
		+15	0.0	0.6	20.6	



Weather: Co	old and Su	nny				
Atmospheric			Groundwater: Dr	y, Base of	Borehole: r	m bgl.
Equipment l	Jsed: GA2	2000 Landfill C	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
01/03/2010	BH01	0	0.0	0.0	21.3	-0.1 to + 0.1
		+1	0.0	0.0	19.5	
		+2	0.0	0.0	19.5	
		+3	0.0	0.0	19.5	
		+4	0.0	0.1	19.5	
		+5	0.1	0.1	19.5	
		+8	0.2	0.1	19.4	
		+10	0.4	0.2	19.6	
		+13	1.8	0.4	19.6	
		+15	2.4	0.4	19.7	
		18	3.1	0.4	19.6	
		20	4.5	0.5	19.7	
		25	5.0	0.5	19.7	

Weather: Co	old and Su	nny				
Atmospheric	Pressure	: 1000mb,	Groundwater: Dr	y, Base of	Borehole: r	m bgl.
Equipment (	Jsed: GA2	2000 Landfill C	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
01/03/2010	BH02	0	0.0	0.0	21.4	-0.1 to + 0.1
		+1	0.1	0.1	19.9	
		+2	0.1	0.1	19.9	
		+3	0.1	0.1	19.9	
		+4	0.1	0.1	19.9	
		+5	0.1	0.1	19.8	
		+8	0.1	0.1	19.7	
		+10	0.1	0.1	19.7	
		+13	0.1	0.1	19.8	
		+15	0.1	0.1	19.8	

Weather: Co			Groundwater: Di	ry, Base of	Borehole: r	n bgl.
Equipment L	Jsed: GA2	2000 Landfill G	as Analyser	<b>,</b>		
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
01/03/2010	BH03	0	0.0	0.0	21.3	-0.1 to + 0.1
		+1	0.0	0.1	20.2	
		+2	0.0	0.1	20.2	
		+3	0.0	0.1	20.3	
		+4	0.0	0.1	20.3	
		+5	0.0	0.1	20.3	
		+8	0.1	0.1	20.3	
		+10	0.1	0.1	20.3	
		+13	0.1	0.1	20.3	
		+15	0.1	0.1	20.3	

Weather: Co	old and Su	nny				
Atmospheric	Pressure	: 1000mb,	Groundwater: D	ry, Base of	Borehole: r	n bgl.
Equipment l	Jsed: GA2	2000 Landfill G	Sas Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
01/03/2010	BH04	0	0.0	0.0	21.6	-0.1 to + 0.1
		+1	0.0	0.1	20.1	
		+2	0.0	0.4	19.9	
		+3	0.0	0.5	19.9	
		+4	0.0	0.6	19.9	
		+5	0.0	0.7	19.9	
		+8	0.0	0.7	19.9	
		+10	0.0	0.8	19.9	
		+13	0.0	0.8	19.9	
		+15	0.0	0.8	19.9	



CO <sub>2</sub> (%vol)	· · · · · · · · · · · · · · · · · · ·	Time (mins)		Equipment L Date
0.1	,	` ′	Location	Date
	0.0	Λ		
C 7		U	BH01	09/03/2010
6.7	0.0	+1		
6.7	0.0	+2		
6.7	0.0	+3		
6.7	0.0	+4		
6.8	0.0	+5		
6.7	0.0	+8		
6.7	0.0	+10		
	6.7 6.7 6.8 6.7	0.0 6.7 0.0 6.7 0.0 6.8 0.0 6.7	+3 0.0 6.7 +4 0.0 6.7 +5 0.0 6.8 +8 0.0 6.7	+3 0.0 6.7 +4 0.0 6.7 +5 0.0 6.8 +8 0.0 6.7

Atmospheric	Pressure	: 1017mb, (	Groundwater: D	ry, Base of	Borehole: m	n bgl.
Equipment l	Jsed: GA2	2000 Landfill G	Sas Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
09/03/2010	BH02	0	0.0	0.1	20.8	+0.1
		+1	0.0	0.2	20.8	
		+2	0.0	0.2	20.7	
		+3	0.0	0.2	20.7	
		+4	0.0	0.2	20.7	
		+5	0.0	0.2	20.7	
		+8	0.0	0.2	20.7	
		+10	0.0	0.2	20.7	

		with cold blue	stery breeze Groundwater: Di	ry Rase of	Borehole: r	n hal
		2000 Landfill G		ry, Base or	Borchole, 1	ii bgi.
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
09/03/2010	BH03	0	0.0	0.1	21.3	-0.1
		+1	0.0	1.3	18.9	
		+2	0.0	1.3	19.0	
		+3	0.0	1.3	19.0	
		+4	0.0	1.3	19.0	
		+5	0.0	1.3	19.0	
		+8	0.0	1.3	19.0	
		+10	0.0	1.3	19.0	

Weather: Su	inny spells	with cold blu	stery breeze			
Atmospheric	Pressure	: 1017mb, (	Groundwater: Dr	y, Base of	Borehole: r	m bgl.
Equipment L	Jsed: GA2	2000 Landfill G	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
09/03/2010	BH04	0	0.0	0.1	21.3	0.0
		+1	0.0	0.7	20.6	
		+2	0.0	1.0	20.6	
		+3	-	-	-	
		+4	0.0	1.4	20.6	
		+5	0.0	1.3	20.6	
		+8	0.0	1.3	20.6	
		+10	0.0	1.2	20.6	



Weather: Su			roundwater: Dry	Page of F	Borehole: m	hal
		2000 Landfill C		, Dase of E	sorenoie. III	i bgi.
- 10-1						
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
16-Mar	BH01	0	0.0	0.1	20.2	'-0.1 to + 0.1
		+1	0.0	7.0	14.3	
		+2	0.0	6.9	14.3	
		+3	0.0	7.0	14.3	
		+4	0.0	6.9	14.2	
		+5	0.0	6.9	14.3	
		+8	0.0	6.9	14.3	
		+10	0.0	6.8	14.3	
		+13	0.0	6.7	14.3	
		+15	0.0	6.7	14.3	

Weather: S	unny and c	alm				
Atmospheri	c Pressure	: 1014mb Gr	oundwater: Dry,	Base of Bo	orehole: m l	ogl.
Equipment	Used: GA2	2000 Landfill G	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
16-Mar	BH02	0	0.0	0.1	20.1	'-0.1 to + 0.1
		+1	0.0	1.4	18.3	
		+2	0.0	1.4	18.2	
		+3	0.0	1.4	18.4	
		+4	0.0	1.4	18.3	
		+5	0.0	1.4	18.4	
		+8	0.0	1.4	18.5	
		+10	0.0	1.3	18.5	
		+13	0.1	1.3	18.5	
		+15	0.0	1.3	18.6	

Weather: St	inny and c	alm				
			roundwater: Dry	Rase of F	Borehole: m	hal
		2000 Landfill C		, Dasc of E	Sorenoie. III	Dgi.
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
16-Mar	BH03	0	0.0	0.0	20.6	'-0.1 to + 0.1
		+1	0.0	0.5	19.8	
		+2	0.0	0.5	19.9	
		+3	0.1	0.5	19.9	
		+4	0.0	0.5	19.9	
		+5	0.0	0.5	20.0	
		+8	0.0	0.5	19.9	
		+10	0.0	0.5	20.0	
		+13	0.1	0.5	19.9	
		+15	0.0	0.5	20.1	

Weather: Si	unny and c	alm				
Atmospheri	c Pressure	: 1014mb Gro	undwater: Dry,	Base of Bo	rehole: m b	gl.
Equipment	Used: GA2	2000 Landfill G	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
16-Mar	BH04	0	0.0	0.0	20.7	'-0.1 to + 0.1
		+1	0.0	0.6	20.2	
		+2	0.0	0.6	20.2	
		+3	0.0	0.6	20.3	
		+4	0.0	0.6	20.4	
		+5	0.0	0.6	20.4	
		+8	0.0	0.5	20.5	
		+10	0.0	0.5	20.6	
		+13	0.0	0.5	20.5	
		+15	0.0	0.5	20.6	



Weather: W	/indy and c	loudy some ra	ain			
Atmospheri	c Pressure	: 1002mb G	roundwater: Dry	, Base of E	Borehole: m	bgl.
Equipment	Used: GA2	2000 Landfill G	Sas Analyser			-
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
22-Mar	BH01	0	0.0	0.1	20.6	'-0.1 to + 0.1
		+1	0.0	7.3	14.6	
		+2	0.0	7.3	14.4	
		+3	0.0	7.3	14.4	
		+4	0.0	7.2	14.4	
		+5	0.0	7.2	14.4	
		+8	0.0	7.2	14.4	
		+10	0.0	7.1	14.4	
		+13	0.0	7.1	14.4	
		+15	0.0	7.1	14.4	

Atmospheri	c Pressure	: 1002mb Gr	oundwater: Dry	, Base of B	orehole: m l	ogl.
Equipment	Used: GA2	2000 Landfill G	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
22-Mar	BH02	0	0.0	0.1	20.5	'-0.1 to + 0.1
		+1	0.0	1.1	18.4	
		+2	0.0	1.2	18.3	
		+3	0.0	1.2	18.3	
		+4	0.0	1.2	18.3	
		+5	0.0	1.2	18.3	
		+8	0.0	1.2	18.3	
		+10	0.0	1.2	18.3	
		+13	0.0	1.2	18.3	
		+15	0.0	1.1	18.3	

Weather: W	indv and c	loudy some ra	ain			
			roundwater: Dry	, Base of E	Borehole: m	bgl.
Equipment	Used: GA2	2000 Landfill G	as Analyser			<u> </u>
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
22-Mar	BH03	0	0.0	0.0	20.6	'-0.1 to + 0.1
		+1	0.0	0.3	19.9	
		+2	0.0	0.4	19.8	
		+3	0.0	0.3	19.8	
		+4	0.0	0.3	19.8	
		+5	0.0	0.4	19.8	
		+8	0.0	0.3	19.8	
		+10	0.1	0.3	19.8	
		+13	0.0	0.3	19.8	
		+15	0.0	0.3	19.9	

Weather: W	/indy and c	loudy some ra	ain			
Atmospheri	c Pressure	: 1002mb G	roundwater: Dry	, Base of E	Borehole: m	bgl.
Equipment	Used: GA2	2000 Landfill C	as Analyser			
Date	Location	Time (mins)	CH <sub>4</sub> (%vol)	CO <sub>2</sub> (%vol)	O <sub>2</sub> (%vol)	Flow Rate (I/hr)
22-Mar	BH04	0	0.0	0.0	20.6	'-0.1 to + 0.1
		+1	0.0	0.2	20.2	
		+2	0.0	0.3	20.2	
		+3	0.0	0.3	20.2	
		+4	0.0	0.3	20.2	
		+5	0.0	0.3	20.2	
		+8	0.0	0.5	20.2	
		+10	0.0	0.5	20.2	
		+13	0.0	0.4	20.2	
		+15	0.0	0.5	20.2	