

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP065		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 10/12/03		DRILLING METHODS : JCB	
							DRILLER : JCB		BOREHOLE DIAMETER : -	
							LOGGED BY : HM		SCREEN TYPE & DIAM: -	
							CHECKED BY : SG		SCREEN SLOT SIZE: -	
							DESCRIPTION	COMMENTS	S,V	
	WSTP065 - 0.1 - 0.2m (2XP)				0.0		Soft to firm, dark brown to black slightly sandy silt with occasional fine to coarse gravel and rootlets. (MADE GROUND)	NVO, damp.	0,0	
			*0.2		0.5		Soft to firm, orange to brown slightly sandy silt with occasional fine to coarse gravel and occasional subangular to subrounded sandstone cobbles. (MADE GROUND)	NVO, damp.	0,0	
	WSTP065 - 0.9m (S,L)				1.0		Loose, light brown slightly silty sand with frequent fine to coarse gravel, with frequent subangular to subrounded sandstone cobbles. (MADE GROUND)	NVO, damp.	0,0	
			*0.2		1.5		Abundant angular to subangular sandstone cobbles and occasional sandstone boulders from 1.5m.	NVO, damp.	0,0	
			*1.1		2.0			NVO, damp.	0,0	
			*0.2		2.5			NVO, damp.	0,0	
			*0.2		3.0			NVO, damp.	0,0	
	WSTP065 - 3.0m (S,L)		*0.4		3.5		Loose to medium dense, brown sand, with abundant black gravel (bitumen and ash) with abundant subangular sandstone cobbles.(MADE GROUND)	NVO, damp.	0,0	
			*0.1		4.0		Trial pit terminated at 4.0m due to refusal.			
					4.5					
					5.0					

LOCATION / NOTES:	LEGEND	BOREHOLE LOG	
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)	Disturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table Perched Water Table	BOREHOLE LOG Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA 	
		App'd:	Date: December 2003
		Drawn : HM	Ref:
		Scale: As scale	Job No: 39991-044-785
		Drg. Size: A4	BOREHOLE LOG

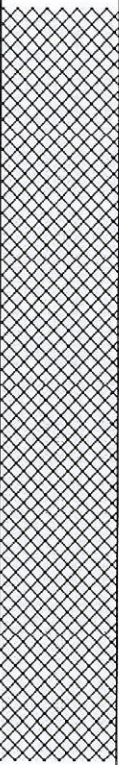
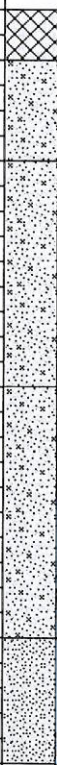
BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP066		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 10/12/03		DRILLING METHODS: JCB	
							DRILLER: JCB		BOREHOLE DIAMETER: -	
							LOGGED BY: HM		SCREEN TYPE & DIAM: -	
							CHECKED BY: SG		SCREEN SLOT SIZE: -	
DESCRIPTION							COMMENTS	S,V		
					0.0	Soft, dark brown slightly sandy silt with occasional fine to coarse gravel, and rootlets. (MADE GROUND).	nvo, damp	0,0		
					0.5	Soft to firm, orange to brown clayey silt with occasional fine to coarse gravel, and occasional subangular sandstone cobbles. (MADE GROUND)	nvo, damp	0,0		
	WSTP066 - 0.5m (2xP)		*0.2							
	WSTP066 - 0.85m (S,L)		*0.2		1.0		Electricity cable at 0.7m - pit extended	0,0		
					1.5	Soft to firm, brown silty SAND with frequent much fine to coarse gravel, frequent angular to subangular sandstone cobbles.	nvo, damp	0,0		
					2.0	Soft to firm, black slightly silty SAND with frequent fine to coarse gravel, and frequent angular to subangular sandstone cobbles.				
	WSTP066 - 2.0m (S,L)		*0.2		2.5		Slight hydrocarbon odour, minimal black hydrocarbon staining	1,0		
			*0.2		3.0	Occasional subangular to angular boulders from 2.8m.		1,0		
			*0.4		3.5	Trial pit terminated at 3.1m due to refusal.				
			*0.1		4.0					
					4.5					
					5.0					

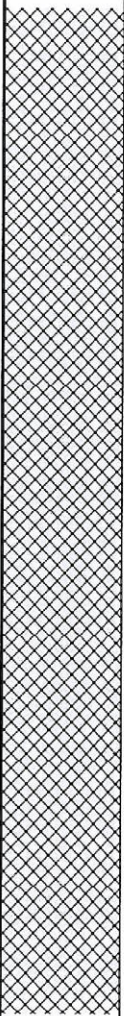
LOCATION / NOTES:	LEGEND	BOREHOLE LOG	
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)	Disturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table Perched Water Table	Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA	
			App'd: _____ Date: December 2003 Drawn: HM Ref: _____ Scale: As scale Job No: 39991-044-785 Drg. Size: A4 BOREHOLE LOG

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP112		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 18/11/03		DRILLING METHODS : JCB	
							DRILLER : JCB - Leighton		BOREHOLE DIAMETER : -	
							LOGGED BY : OG		SCREEN TYPE & DIAM: -	
							CHECKED BY : SG		SCREEN SLOT SIZE: -	
						DESCRIPTION	COMMENTS	S,V		
	WSTP112 - 0.45m (2XP,S,L)	☒	*2.2		0.0	Loose, mottled brown to black, slightly silty, fine to coarse sand with frequent angular sandstone gravel to cobbles, occasional cobble size slag and frequent gravel size ashy material. (MADE GROUND)	Dry to Damp NVO, Electric cable bricks at 0.5m.	0,0		
			*10.5		0.5					
			*2.8		1.0	Becoming loose, silty fine to medium, clayey sand with frequent angular gravel and cobbles and occasional cobble to gravel size slag fragments. (MADE GROUND)	Damp	0,0		
					1.5	With frequent angular cobbles and small sandstone boulders from 1.3m.	Damp	0,0		
			*1.9		2.0	With occasional large slag cobbles and metal fragments from 1.9m.	Strong hydrocarbon odour within black clay	0,0		
	WSTP112- 2.15m (S,L)	☒			2.5	With whole bricks and patches of black silty clay from 2.1m.				
			*8.2		3.0	Soft to firm, orange, very silty clay with occasional subangular to rounded gravel. (MADE GROUND)		3,0		
					3.5	Loose, light to dark grey, slightly silty, fine to coarse sand with frequent angular gravel to cobbles and frequent gravel size slag. (MADE GROUND)				
					4.0	Trial pit terminated at 2.7m.				
					4.5					
					5.0					

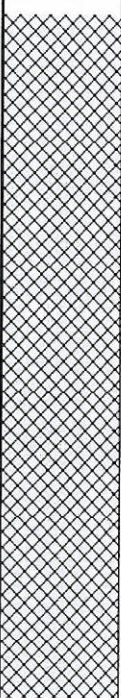
LOCATION / NOTES:	LEGEND	BOREHOLE LOG	
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)	Disturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table Perched Water Table	Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA 	
		App'd:	Date: November 2003
		Drawn : OG	Ref:
		Scale: As scale	Job No: 39991-044-785
		Drg. Size: A4	BOREHOLE LOG

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP114		PAGE 1 of 1						
	NUMBER	TYPE					DRILLING DATES: 10/12/03		DRILLING METHODS : JCB						
							DRILLER : JCB		BOREHOLE DIAMETER : -						
							LOGGED BY : HM		SCREEN TYPE & DIAM: -						
							CHECKED BY : SG		SCREEN SLOT SIZE: -						
DESCRIPTION		COMMENTS	S,V												
	WSTP114 - 0.75m (S,L)		* <0.1	0.0	Loose, light brown silty sand with frequent rootlets and occasional fine to coarse gravel. (MADE GROUND)	NVO, damp.	0,0								
			* <0.1	0.5	Soft to firm, dark brown sandy silt with some fine to coarse gravel comprising of ash. (MADE GROUND)	NVO, damp.	0,0								
			* <0.1	1.0	Soft to firm orange brown SILT	NVO, damp.	0,0								
			* <0.1	1.5	Soft to firm, light brown sandy SILT with frequent fine to coarse gravel with frequent subrounded to subangular sandstone cobbles.	NVO, damp.	0,0								
			* <0.1	2.0	With abundant angular to subangular cobbles from 1.8m. Trial pit terminated at 2.0m at refusal on bedrock	NVO, dry.	0,0								
LOCATION / NOTES:		LEGEND		BOREHOLE LOG											
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)		 Disturbed Sample  Undisturbed Sample  Headspace Analysis  Down Borehole Analysis  Groundwater Table  Perched Water Table		Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA  <table><tr><td>App'd:</td><td>Date: December 2003</td></tr><tr><td>Drawn : HM</td><td>Ref:</td></tr><tr><td>Scale: As scale</td><td>Job No: 39991-044-785</td></tr><tr><td>Drg. Size: A4</td><td>BOREHOLE LOG</td></tr></table>				App'd:	Date: December 2003	Drawn : HM	Ref:	Scale: As scale	Job No: 39991-044-785	Drg. Size: A4	BOREHOLE LOG
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Drawn : HM	Ref:														
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Drg. Size: A4	BOREHOLE LOG														

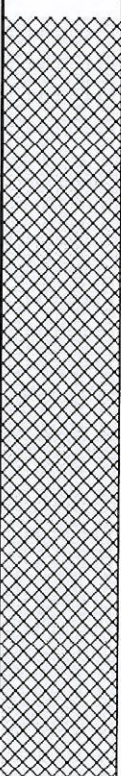
BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP115		PAGE 1 of 1		
	NUMBER	TYPE					DRILLING DATES: 10/12/03		DRILLING METHODS : JCB		
							DRILLER : JCB		BOREHOLE DIAMETER : -		
							LOGGED BY : HM		SCREEN TYPE & DIAM: -		
		CHECKED BY : SG		SCREEN SLOT SIZE: -							
	WSTP115 - 0.2m (2xP)				0.0		DESCRIPTION		COMMENTS	S,V	
							Soft, dark brown slightly sandy silt with much rootlets, slightly ashy. (MADE GROUND)	NVO, tar on surface.	0,0		
	WSTP115 - 0.5-0.6m (PSD)		*<0.1		0.5		Soft, orange brown slightly sandy SILT with occasional fine to coarse gravel, occasional subrounded to subangular cobbles.	Dry - damp, NVO.	0,0		
	WSTP115 - 0.9m (S,L)		*<0.1		1.0		Loose, light brown silty SAND with frequent fine to coarse gravel, occasional subrounded to subangular cobbles.	Dry - damp, NVO.	0,0		
					1.5		With abundant fine to coarse gravel and frequent subangular to subrounded cobbles.	Dry - damp, NVO.	0,0		
					2.0		Becoming less silty.	Dry - damp, NVO.	0,0		
	WSTP115 - 2.5m (S,L)		*1.8		2.5		Medium dense, light brown SAND with abundant fine to coarse gravel and abundant angular to subrounded sandstone cobbles.	Dry - damp, NVO.	0,0		
					3.0		With occasional to frequent angular sandstone boulders at base.				
					3.5		Trial pit terminated at 3.0m due to refusal on bedrock.				
					4.0						
LOCATION / NOTES: NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)						LEGEND  Disturbed Sample  Undisturbed Sample  Headspace Analysis  Down Borehole Analysis  Groundwater Table  Perched Water Table		BOREHOLE LOG Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA 			
						App'd: _____ Date: December Drawn : HM Ref: _____ Scale: As scale Job No: 39991-044-785 Drg. Size: A4 BOREHOLE LOG					

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP116		PAGE 1 of 1																
	NUMBER	TYPE					DRILLING DATES: 9/12/03		DRILLING METHODS : JCB																
							DRILLER : JCB		BOREHOLE DIAMETER : -																
							LOGGED BY : HM		SCREEN TYPE & DIAM: -																
		CHECKED BY : SG		SCREEN SLOT SIZE: -																					
	WSTP116 - 0.9m (S,L)	☒	*0.1		0.0		Soft, dark brown sandy silt with occasional fine to coarse gravel, frequent subangular to subrounded sandstone cobbles and tarmac, occasional black ash and rootlets, occasional subangular sandstone boulders. (MADE GROUND)	NVO	0,0																
					0.5			5-10cm uneven ash layer from 1.0m.	6" Diameter pipe. 12" diameter pipe diagonal on E wall.	0,0															
					1.0				Dry, NVO.	0,0															
					1.5				Dry, NVO.	0,0															
					2.0				Dry, NVO.	0,0															
					2.5				Dry, NVO.	0,0															
					3.0				Grey staining and moderate fairly light hydrocarbon odour, fairly wet - damp.	3,3															
					3.5				Mid range hydrocarbon odour, stained grey.	3,3															
					4.0																				
					5.0																				
LOCATION / NOTES: NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)						LEGEND  Disturbed Sample  Undisturbed Sample  Headspace Analysis  Down Borehole Analysis  Groundwater Table  Perched Water Table						BOREHOLE LOG Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA  <table border="1"> <tr> <td>App'd:</td> <td>Date: December</td> </tr> <tr> <td>Drawn : HM</td> <td>Ref:</td> </tr> <tr> <td>Scale: As scale</td> <td>Job No: 39991-044-785</td> </tr> <tr> <td>Drg. Size: A4</td> <td>BOREHOLE LOG</td> </tr> </table>						App'd:	Date: December	Drawn : HM	Ref:	Scale: As scale	Job No: 39991-044-785	Drg. Size: A4	BOREHOLE LOG
App'd:	Date: December																								
Drawn : HM	Ref:																								
Scale: As scale	Job No: 39991-044-785																								
Drg. Size: A4	BOREHOLE LOG																								

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP118		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 12/11/03		DRILLING METHODS : JCB	
							DRILLER : JCB		BOREHOLE DIAMETER : -	
							LOGGED BY : JW		SCREEN TYPE & DIAM: -	
							CHECKED BY : SG		SCREEN SLOT SIZE: -	
				DESCRIPTION		COMMENTS	S,V			
WSTP118-0.5m (S,L,2xP)		*1.5	0.0	Tarmac. (MADE GROUND)	NVO.	0,0				
		*1.3	0.5	Loose purple brown black ashy sand with occasional brick and abundant fine to coarse angular gravel and cobbles. (MADE GROUND)	Slight odour and discoloration.	1,1				
WSTP118-3.0m (S,L)		*1.6	1.0	Loose light brown slightly sandy silt with fine to coarse sub angular gravel. (MADE GROUND)	NVO.	0,0				
		*0.9	1.5	Firm orange to brown fine sandy SILT with gravel.	Slight light hydrocarbon odour to base.	1,0				
		*6.3	2.0	With cobbles and boulders from 1.3m.						
			2.5	Cobbles and boulders becoming frequent from 1.95m.						
		*1.7	3.0	Loose light brown silty fine SAND with some medium to coarse sub rounded gravel, cobbles and boulders.						
			3.0	Trial pit terminated at 3.0m due to refusal.						
LOCATION / NOTES:			LEGEND			BOREHOLE LOG				
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)			Disturbed Sample ■ Undisturbed Sample * Headspace Analysis † Down Borehole Analysis ▽ Groundwater Table ▽ Perched Water Table			Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA URS App'd: _____ Date: December 2003 Drawn : JW Ref: _____ Scale: As Shown Job No: 39991-044-785 Drg. Size: A4 BOREHOLE LOG				

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP149		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 7/11/03		DRILLING METHODS: JCB	
							DRILLER: JCB		BOREHOLE DIAMETER: -	
							LOGGED BY: SS		SCREEN TYPE & DIAM: -	
				CHECKED BY: SG		SCREEN SLOT SIZE: -				
					0.0		DESCRIPTION		COMMENTS	S,V
	WSTP149 - 0.6m. (P)				0.5		Loose to medium dense, brown, very sandy silt with some rootlets and occasional angular to rounded cobbles with less than 5% ash/coal fragments. (MADE GROUND)	Dry-damp. Slight organic (non-hydrocarbon) odour	0,0	
	WSTP149 - 0.7m (S,L)		*1.9		1.0		Increasing silt content from 0.9m.	Damp-wet. NVO	0,0	
			*2.0		1.5		Colour change from brown to yellow-brown and increase in tabular cobbles content from 1.2m.			
			*2.3		2.0		With frequent flaggy cobbles (weathered bedrock) from 2.0m	Dry-damp. NVO	0,0	
	WSTP149 - 2.3m (S,L)		*2.8		2.5					
			*2.4		3.0	Terminated at 2.8m due to refusal on bedrock.				
					3.5					
					4.0					
					4.5					
					5.0					

LOCATION / NOTES:	LEGEND	BOREHOLE LOG	
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)	 Disturbed Sample  Undisturbed Sample  Headspace Analysis  Down Borehole Analysis  Groundwater Table  Perched Water Table	Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA 	
		App'd:	Date: November 2003
		Drawn: SS	Ref:
		Scale: As scale	Job No: 39991-044-785
		Org. Size: A4	BOREHOLE LOG

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP150		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 7/11/03		DRILLING METHODS: JCB	
							DRILLER: JCB		BOREHOLE DIAMETER: -	
							LOGGED BY: SS		SCREEN TYPE & DIAM: -	
							CHECKED BY: SG		SCREEN SLOT SIZE: -	
							DESCRIPTION	COMMENTS	S,V	
	WSTP150 - 0.8m (S,L,P)		*1.0			0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0	Loose, dark brown, slightly sandy SILT with frequent cobbles and gravels of sandstone.	Dry-damp. NVO	0,0	
							Becoming more sandy with less frequent cobble-sized material.	Damp. NVO	0,0	
							With frequent, small angular cobbles of sandstone from 2.5m.	Damp-wet. NVO	0,0	
							Cobbles becoming larger from 2.8m	NVO	0,0	
							Terminated at 3.1m due to refusal.			
	WSTP150 - 2.6m (S,L)		*1.7							
			*1.9							

LOCATION / NOTES:

NVO = No visual or olfactory evidence of contamination
S,V = Contamination Observations
S - Odour score (0-5)
V - Visual score (0-5)

LEGEND

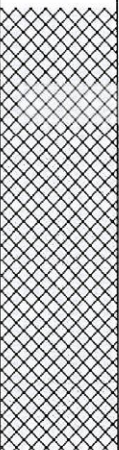
-  Disturbed Sample
-  Undisturbed Sample
-  Headspace Analysis
-  Down Borehole Analysis
-  Groundwater Table
-  Perched Water Table

BOREHOLE LOG

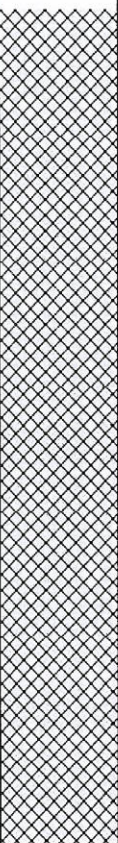
Job Title: BP Llandarcy Whole Site Investigation
Location: BP Llandarcy Refinery
Client: BP/WDA



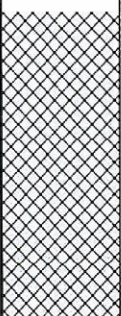
App'd:	Date: November 2003
Drawn: SS	Ref:
Scale: As scale	Job No: 39991-044-785
Drg. Size: A4	BOREHOLE LOG

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP169		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 4/12/03		DRILLING METHODS: JCB	
							DRILLER: JCB - John		BOREHOLE DIAMETER: -	
							LOGGED BY: J.G		SCREEN TYPE & DIAM: -	
							CHECKED BY: SG		SCREEN SLOT SIZE: -	
						DESCRIPTION	COMMENTS	S,V		
	WSTP169 0.5m (S,L,2xP)		*16.5		0.0	Soft, light brown clayey silt with large patches of grey to brown and smaller patches of black material with higher clay content. (MADE GROUND)				
					0.5	Medium dense, light brown clayey silt with gravel to large cobbles, including brick and rubble. (MADE GROUND)	Grey staining with occasional black patches	2, 3		
					1.0	With increasing rubble from 1.2m.	Black staining stopped.	2, 3		
					1.5		Dry. Sides collapsing from 1.5m	2, 3		
	WSTP169 1.8m (S,L)		*156		2.0	Trial pit terminated at 1.8m due to collapse				
					2.5					
					3.0					
					3.5					
					4.0					
					4.5					
					5.0					

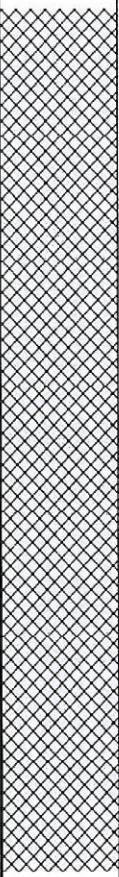
LOCATION / NOTES:	LEGEND	BOREHOLE LOG	
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		App'd:	Date: January 2004
		Drawn: JG	Ref:
		Scale: As scale	Job No: 39991-044-785
		Drg. Size: A4	BOREHOLE LOG

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP185		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 21/11/2003		DRILLING METHODS: JCB	
							DRILLER: JCB - Viv		BOREHOLE DIAMETER: -	
							LOGGED BY: OG		SCREEN TYPE & DIAM: -	
							CHECKED BY: SG		SCREEN SLOT SIZE: -	
DESCRIPTION		COMMENTS	S,V							
	WSTP185-0.5m (S,L)		*2.3	0.0	Soft to firm grey and orange mottled silty CLAY with occasional rootlets.	Damp	2,0			
			*0.8	0.5	Becoming fine to coarse sandy silty CLAY with frequent angular sandstone cobbles and subangular to angular gravel from 1.0m.	Damp	2,0			
			*0.7	1.0	With patches of stiffer grey silt and iron stained angular sandstone gravel and cobbles from 1.5m.	Damp	2,0			
			*0.9	1.5	Loose light brown to grey slightly clayey silty fine to coarse SAND with numerous subangular gravel and cobbles and occasional subrounded orange sandstone cobbles	Damp	1,0			
			*0.5	2.0	With frequent tabular sandstone clasts from 2.5m.	Damp	1,0			
	WSTP185-3.4m (S,L)		*1.3	2.5	With occasional gravel and cobbles from 3.0m	Damp. Black staining. Slow water ingress at 3.4m.	1,0			
				3.0	Trial pit terminated at 3.4m.					
				3.5						
				4.0						
				4.5						
				5.0						

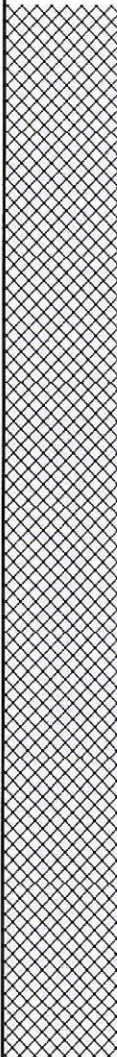
LOCATION / NOTES:	LEGEND	BOREHOLE LOG	
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)	 Disturbed Sample  Undisturbed Sample  Headspace Analysis  Down Borehole Analysis  Groundwater Table  Perched Water Table	Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA 	
		App'd:	Date: February 2004
		Drawn: CM	Ref:
		Scale: As scale	Job No: 39991-044-785
		Drg. Size: A4	BOREHOLE LOG

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP186		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 24/11/2003		DRILLING METHODS: JCB	
							DRILLER: JCB - Will		BOREHOLE DIAMETER: -	
							LOGGED BY: OG		SCREEN TYPE & DIAM: -	
							CHECKED BY: SG		SCREEN SLOT SIZE: -	
DESCRIPTION		COMMENTS	S,V							
	WSTP186-0.6m (S,L)	☒ *194.0 ☐ *123.0	0.0	Soft brown fine to coarse sandy clayey silt with frequent rootlets and angular to subangular gravel to cobbles. (MADE GROUND)	Damp	1,0				
			0.5	Soft grey to black sandy clayey silt with frequent angular to subangular gravel to cobbles and rare subangular to subrounded boulders. (MADE GROUND)	Wet. Strong hydrocarbon odour. Fast water ingress at 0.9m. Grey brown.	3,3				
			1.0			3,3				
			1.5	Trial pit terminated at 1.25m due to refusal.	1.0m diameter concrete pipe broken at collar.					
			2.0							
			2.5							
			3.0							
			3.5							
			4.0							
			4.5							
			5.0							

LOCATION / NOTES: NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)	LEGEND  Disturbed Sample  Undisturbed Sample  Headspace Analysis  Down Borehole Analysis  Groundwater Table  Perched Water Table	BOREHOLE LOG Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA 	App'd: _____ Date: February 2004 Drawn: CM Ref: _____ Scale: As scale Job No: 39991-044-785 Drg. Size: A4 BOREHOLE LOG
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BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP186A		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 24/11/2003		DRILLING METHODS : JCB	
							DRILLER : JCB		BOREHOLE DIAMETER : -	
							LOGGED BY : OG		SCREEN TYPE & DIAM: -	
							CHECKED BY : SG		SCREEN SLOT SIZE: -	
DESCRIPTION		COMMENTS	S,V							
	WSTP186A-0.6m (S,L,2xP)	☒	*157.0	0.0	Loose mottled light brown to grey black silty fine to medium SAND with occasional subangular gravel and frequent rootlets.	Damp.	4,4			
			*84.1	0.5	Soft grey, locally orange, sandy SILT with trace clay, frequent subangular to angular gravel and occasional cobbles, patches of dense to stiff mottled orange grey black clayey silt.	Damp	4,4			
			*72.7	1.0	With frequent dense to stiff pockets and frequent angular gravel and cobbles from 1.0m.	Slow water ingress at 0.9m. Damp.	3,3 3,3			
			*44.5	1.5	Soft to firm grey to black clayey SILT with rare fine to coarse sand and some patches of stiff to dense material.	Wet	1,1			
			*22.1	2.0	With occasional angular cobbles from 2.0m.	Damp	2,1			
			*339	2.5	Loose brown/grey silty fine to coarse SAND with trace amounts of clay and frequent angular to subangular gravel to cobbles.	Damp				
WSTP186A-3.0m (S,L)	☒	*12.0	3.0	With numerous subangular cobbles from 3.0m.	Damp-wet	3,1				
			3.5	Trial pit terminated at 3.5m due to refusal.	Saturated	2,1				
			4.0							
				4.5						
				5.0						

LOCATION / NOTES:	LEGEND	BOREHOLE LOG	
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)	 Disturbed Sample  Undisturbed Sample  Headspace Analysis  Down Borehole Analysis  Groundwater Table  Perched Water Table	Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA	
			App'd: _____ Date: February 2004 Drawn : CM Ref: _____ Scale: As scale Job No: 39991-044-785 Drg. Size: A4 BOREHOLE LOG

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP264		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 9/12/2003		DRILLING METHODS : JCB	
							DRILLER : JCB		BOREHOLE DIAMETER : -	
							LOGGED BY : HM		SCREEN TYPE & DIAM: -	
							CHECKED BY : SG		SCREEN SLOT SIZE: -	
DESCRIPTION		COMMENTS	S,V							
	WSTP264 - 0.5m (S,L, 2xP)	*1.3		0.0	Soft to firm, dark brown slightly sandy silt with frequent fine to coarse gravel, frequent subangular sandstone cobbles,ash and bricks. (MADE GROUND)	NVO, dry.	0,0			
				0.5	Becoming increasingly orange brown from 0.6m.	NVO, dry.	0,0			
		*2.2		1.0	Soft to firm, orange brown silt with occasional fine to coarse gravel, occasional cobbles. (MADE GROUND)	NVO, dry.	0,0			
		*3.1		1.5		2' diameter pipe at 1.4m. NVO, dry.	0,0			
	WSTP264 - 3.0m (S,L)	*2.1		2.0	Soft to firm, orange brown sandy SILT with frequent fine to coarse gravel, frequent subangular grey sandstone cobbles.	NVO, dry.	0,0			
				2.5		NVO, dry.	0,0			
		*172.2		3.0	Loose, brown medium to coarse SAND with frequent fine to coarse gravel, occasional subangular to subrounded sandstone cobbles and occasional boulders.	NVO, dry.	0,0			
		*3.3		3.5	With abundant fine to coarse gravel, subangular to subrounded cobbles from 3.3m.	NVO, dry.	0,0			
		*3.1		4.0		Damp,	0,0			
				4.5	Trial pit terminated at 4.2m					
				5.0						

LOCATION / NOTES:		LEGEND		BOREHOLE LOG	
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)		 Disturbed Sample  Undisturbed Sample  Headspace Analysis  Down Borehole Analysis  Groundwater Table  Perched Water Table		Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA	
				App'd:	Date: December 2003
				Drawn : HM	Ref:
				Scale: As scale	Job No: 39991-044-785
				Drg. Size: A4	BOREHOLE LOG

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP305		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 12/03		DRILLING METHODS : JCB	
							DRILLER : JCB		BOREHOLE DIAMETER : -	
							LOGGED BY : HM		SCREEN TYPE & DIAM: -	
							CHECKED BY : SG		SCREEN SLOT SIZE: -	
DESCRIPTION		COMMENTS	S,V							
	WSTP305 - 0.95m (S,L) WSTP305 - 1.0m (PSD)		*13	0.0	Soft, friable, orange brown slightly sandy silt with rootlets, occasional fine to coarse gravel, subangular sandstone cobbles and ash from 0.2-0.25m. (MADE GROUND)	NVO, dry.	0,0			
			*819	0.5	Becoming more orange with occasional subrounded cobbles and boulders.	Damp.	0,0			
			*2135	1.0	Soft, friable, grey sandy SILT with frequent fine to coarse gravel and occasional subangular to subrounded cobbles.	Grey staining becomes uniform grey. Moderate odour of light hydrocarbon. Damp.	3,3			
			*2484	1.5	Becoming a loose silty SAND with frequent fine to coarse gravel, and occasional subangular to subrounded black cobbles.	Staining darker from 1.8m. Odour stronger of light hydrocarbon.	4,4			
			*2247	2.0	Increase in subrounded cobbles with abundant fine to coarse gravel from 1.9m.	Odour becoming more oily.	4,4			
	WSTP305 - 2.0m (S,L)		*1483	2.5	With occasional subangular to subrounded boulders from 2.6m.	Wet, with an oily sheen.	4,4			
			*580	3.0	Trial pit terminated at 3.5m due to refusal.	Water seepage at 2.6m	4,5			
				3.5			4,5			
				4.0						
				4.5						
			5.0							

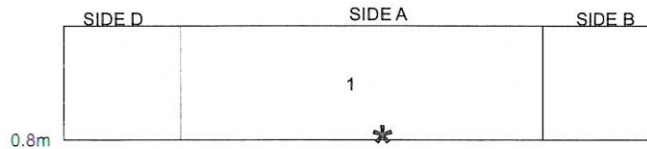
LOCATION / NOTES:		LEGEND		BOREHOLE LOG	
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)		 Disturbed Sample  Undisturbed Sample  Headspace Analysis  Down Borehole Analysis  Groundwater Table  Perched Water Table		Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA	
		App'd: _____ Date: December 2003 Drawn : HM Ref: _____ Scale: As scale Job No: 39991-044-785 Drg. Size: A4 BOREHOLE LOG			

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSTP307		PAGE 1 of 1	
	NUMBER	TYPE					DRILLING DATES: 9/12/03		DRILLING METHODS: JCB	
							DRILLER: JCB		BOREHOLE DIAMETER: -	
							LOGGED BY: HM		SCREEN TYPE & DIAM: -	
							CHECKED BY: SG		SCREEN SLOT SIZE: -	
DESCRIPTION							COMMENTS	S,V		
					0.0	Tarmac, gravel and metal fragments over soft to medium dense, dark brown sandy silt with occasional fine to coarse gravel and abundant subangular sandstone cobbles. (MADE GROUND)	NVO, dry.	0,0		
	WSTP307 - 0.5m (2xP)		*4.4		0.5			0,0		
	WSTP307 - 0.8m (S,L)		*148		1.0		Dark grey staining, moderate to midrange hydrocarbon odour, dry.	3,3		
			*718		1.5			3,3		
			*148		2.0	Becoming less sandy and more silty, with occasional fine to coarse gravel, some subangular cobbles from 1.5m.	Staining more uniform, still mottled in areas, odour moderate to strong.	3,3		
			*508		2.5			3,3		
	WSTP307 - 2.9m (S,L)		*860		3.0	Slightly clayey SILT with occasional fine to coarse gravel and subrounded grey sandstone boulders.	Damp - wet with oily sheen.	4,3		
			*43		3.5		Wet seepage on N wall at 2.5m.			
			*76.9		4.0	Soft to firm, grey with orange and dark brown mottling, sandy SILT with occasional fine to coarse gravel and subangular to subrounded sandstone cobbles.	Decaying organic material at 2.6m, black and wet.	3,3		
					4.5		Moderate odour.			
					5.0	With increasing gravel and subrounded cobbles from 4.0m.	Damp.	3,3		
						Trial pit terminated at 4.1m due to refusal.		3,3		

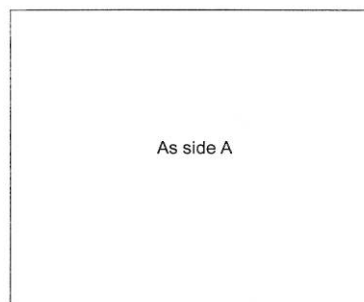
LOCATION / NOTES:	LEGEND	BOREHOLE LOG	
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)	Disturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table Perched Water Table	Job Title: BP Llandarcy Whole Site Investigation Location: BP Llandarcy Refinery Client: BP/WDA App'd: _____ Date: December 2003 Drawn: HM _____ Ref: _____ Scale: As scale _____ Job No: 39991-044-785 Drg. Size: A4 _____ BOREHOLE LOG	

TRIAL PIT NUMBER: MSTP033
 GROUND ELEVATION: -
 DATE OF EXCAVATION: 16/6/98
 WATER LEVEL: DRY
 LOGGED BY: RF
 APPROVED BY:

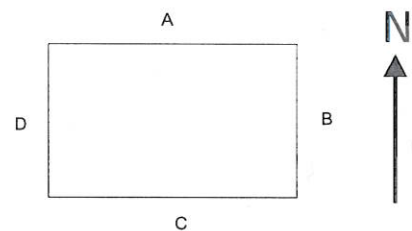
SIDE ELEVATIONS



SIDE C



PLAN



Key:

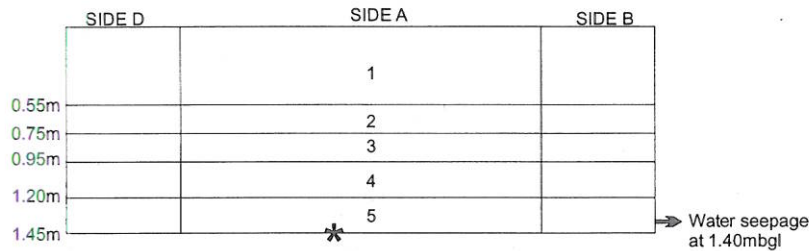
- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- ➡ Water Ingress

STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Dark brown clay rich matrix, very loose, bricks, cobbles and gravel (MADE GROUND) Trial pit terminated at 0.8 mbgl due to large number of cobbles and boulders	a. No hydrocarbon odour or staining evident	<u>PID RESULTS</u> 0.5m - 5.2 ppm 0.8m - 7.3 ppm <u>SOIL SAMPLES</u> MSTP033-0.8m

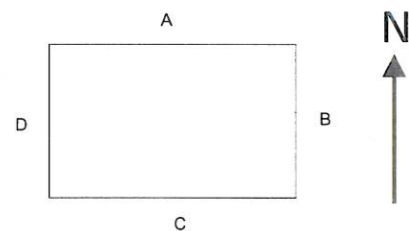
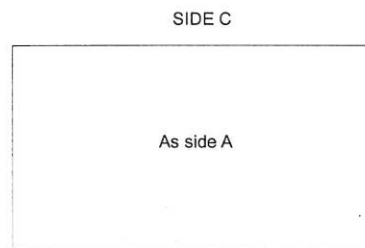
Job Title:	SOIL & GROUNDWATER INVESTIGATION	
Location:	LLANDARCY REFINERY	
Client:	BP LLANDARCY	
Job No:	39991-001-401	DRAFT
 DAMES & MOORE		

TRIAL PIT NUMBER: MSTP063
GROUND ELEVATION: -
DATE OF EXCAVATION: 28/5/98
WATER LEVEL: 1.40 mbgl
LOGGED BY: RF
APPROVED BY:

SIDE ELEVATIONS



PLAN



Key:

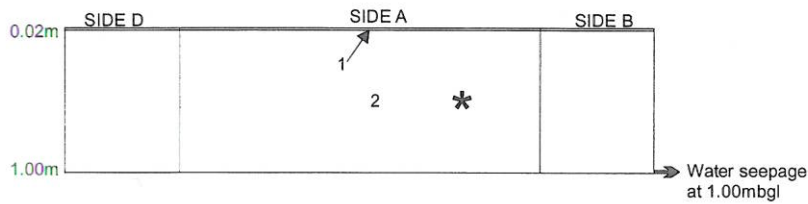
- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- ⇒ Water Ingress

STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Slightly sandy CLAY (TOPSOIL) with some gravel and cobbles 2. Shale GRAVEL with some silty sandy CLAY 3. Stiff orange-brown CLAY 4. Stiff pale grey/brown CLAY 5. Dark grey CLAY with sandstone gravel Trial pit terminated at 1.45 mbgl	a. Slight oil sheen on water surface	<u>PID RESULTS</u> 0.5m - 0.4ppm 1.00m - 0.2ppm 1.45m - 9.3ppm <u>SOIL SAMPLES</u> MSTP63-1.45m

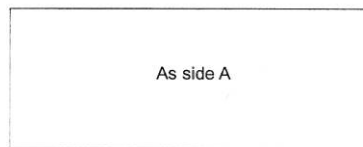
Job Title:	SOIL & GROUNDWATER INVESTIGATION	
Location:	LLANDARCY REFINERY	
Client:	BP LLANDARCY	
Job No:	39991-001-401	DRAFT
 DAMES & MOORE		

TRIAL PIT NUMBER: MSTP068
GROUND ELEVATION: -
DATE OF EXCAVATION: 1/6/98
WATER LEVEL: 1.00 mbgl
LOGGED BY: RF
APPROVED BY:

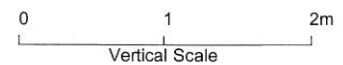
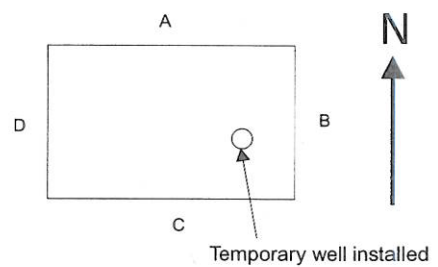
SIDE ELEVATIONS



SIDE C



PLAN



Key:

- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- Water Ingress

STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Brown sandy silty CLAY (TOPSOIL) 2. Black clayey coarse GRAVEL with coarse GRAVEL with cobbles (MADE GROUND) Trial pit terminated 1.00 mbgl	a. Boggy area, very wet - surface water oily	<u>PID RESULTS</u> 0.5m - 194ppm 1.0m - 12.8ppm <u>SOIL SAMPLES</u> MSTP68-0.50m

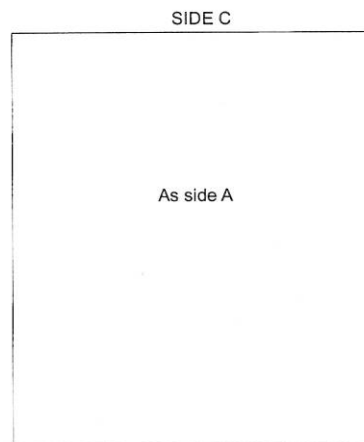
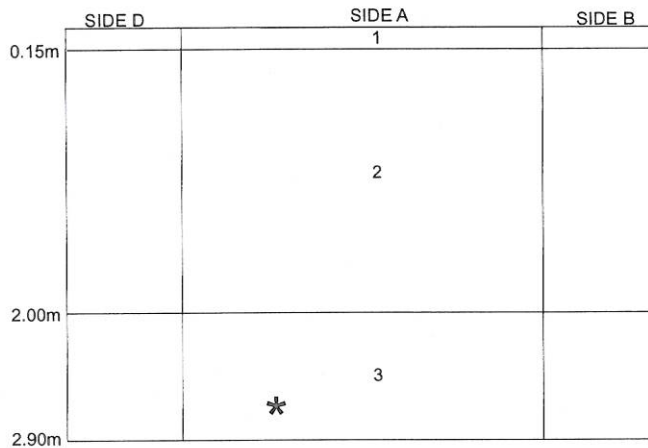
Job Title:	SOIL & GROUNDWATER INVESTIGATION
Location:	LLANDARCY REFINERY
Client:	BP LLANDARCY
Job No:	39991-001-401
	DRAFT



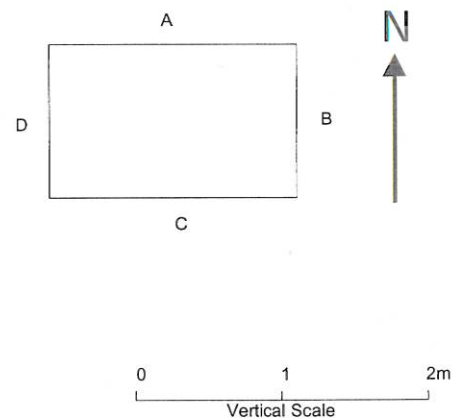
DAMES & MOORE

TRIAL PIT NUMBER: MSTP075
 GROUND ELEVATION: -
 DATE OF EXCAVATION: 1/6/98
 WATER LEVEL: DRY
 LOGGED BY: RF
 APPROVED BY:

SIDE ELEVATIONS



PLAN



Key:

- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- Water Ingress

STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Brown CLAY (TOPSOIL) 2. Dark brown GRAVEL with brick, rubble, clinker, and tarmac fragments (MADE GROUND) 3. Firm grey CLAY, some coarse gravel from 2.75m Trial pit terminated at 2.90 mbgl	a. Dry, dusty b. No odour or staining	<u>PID RESULTS</u> 1.0m - 0ppm 1.5m - 1.2ppm 2.0m - 0ppm 2.5m - 4.5ppm 2.8m - 1.0ppm <u>SOIL SAMPLES</u> MSTP75-2.50m

Job Title: **SOIL & GROUNDWATER INVESTIGATION**

Location: **LLANDARCY REFINERY**

Client: **BP LLANDARCY**

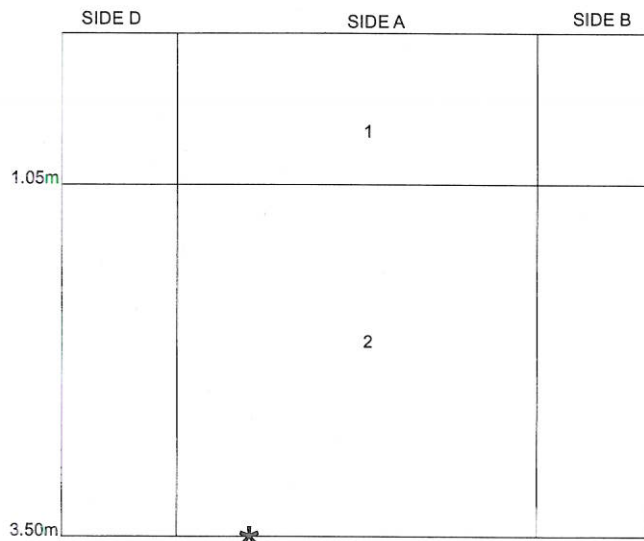
Job No: **39991-001-401**

DRAFT

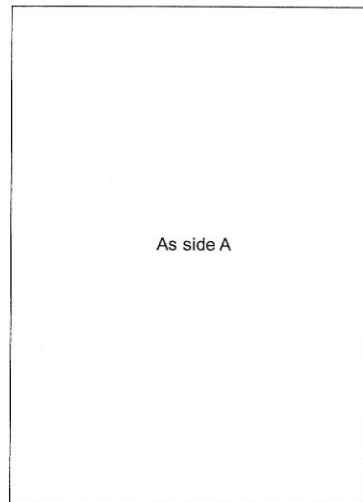


DAMES & MOORE

SIDE ELEVATIONS

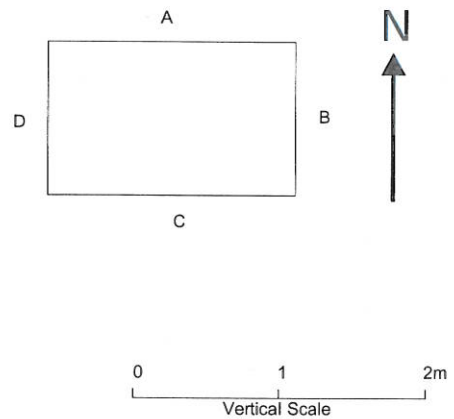


SIDE C



TRIAL PIT NUMBER: MSTP087
GROUND ELEVATION: -
DATE OF EXCAVATION: 1/6/98
WATER LEVEL: DRY
LOGGED BY: RF
APPROVED BY:

PLAN



Key:

- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- Water Ingress

STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Stiff brown and orange CLAY with grey bands, becoming frequent at 0.95m, with some medium gravel 2. Very stiff grey-black CLAY with rounded and sub-angular gravel Trial pit terminated at 3.5mbgl	a. Black staining at surface (due to application of oil in landfarm area) b. Slight staining and hydrocarbon odour c. Degraded oil at 1.5m d. Damp at 3.5m	<u>PID RESULTS</u> 0.5m - 0 ppm 1.0m - 0 ppm 1.5m - 0 ppm 2.25m - 0 ppm 3.0m - 0 ppm 3.5m - 0 ppm <u>SOIL SAMPLES</u> MSTP087-3.5m

Job Title: **SOIL & GROUNDWATER INVESTIGATION**

Location: **LLANDARCY REFINERY**

Client: **BP LLANDARCY**

Job No: **39991-001-401**

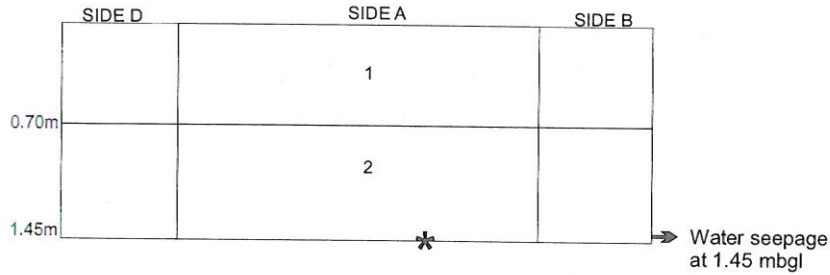
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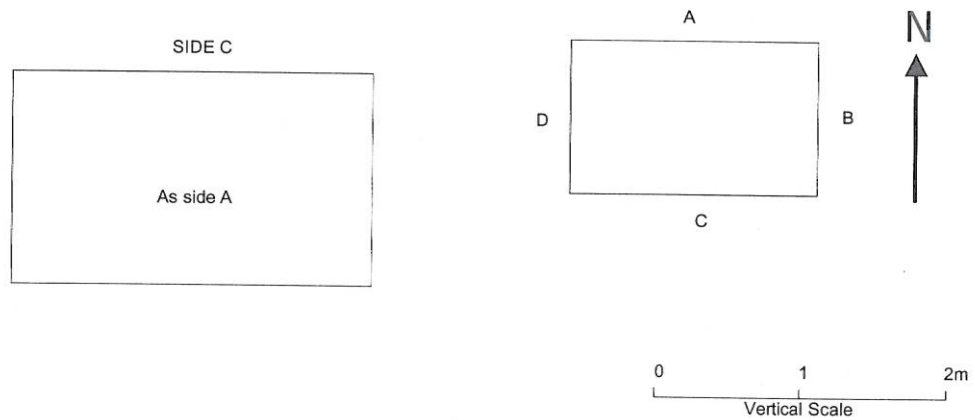
DAMES & MOORE

TRIAL PIT NUMBER: MSTP095
GROUND ELEVATION: -
DATE OF EXCAVATION: 1/6/98
WATER LEVEL: 1.45 mbgl
LOGGED BY: RF
APPROVED BY:

SIDE ELEVATIONS



PLAN



Key:

- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- Water Ingress

Job Title: **SOIL & GROUNDWATER INVESTIGATION**

Location: **LLANDARCY REFINERY**

Client: **BP LLANDARCY**

Job No: **39991-001-401** **DRAFT**

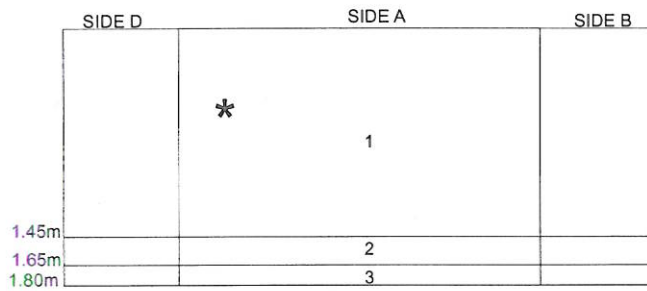


DAMES & MOORE

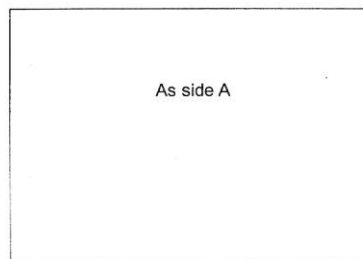
STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Firm brown CLAY becoming stiffer and gravelly with depth 2. Silty, gravelly CLAY becoming stiff with depth Trial pit terminated at 1.5 mbgl	a. No odour or staining evident	<u>PID RESULTS</u> 0.5m - 0ppm 1.0m - 0 ppm 1.5m - 0 ppm <u>SOIL SAMPLES</u> MSTP095-1.45m

TRIAL PIT NUMBER: MSTP117
GROUND ELEVATION: -
DATE OF EXCAVATION: 3/6/98
WATER LEVEL: DRY
LOGGED BY: RF
APPROVED BY:

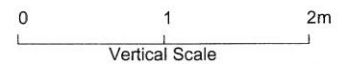
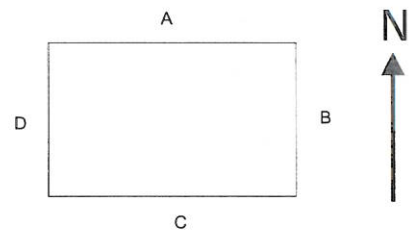
SIDE ELEVATIONS



SIDE C



PLAN



Key:

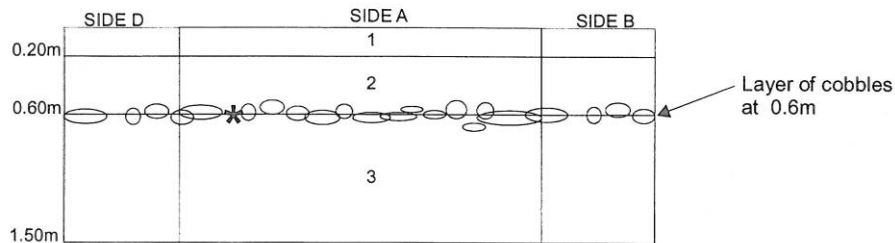
- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- Water Ingress

STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Dark brown CLAY with brick fragments, coarse gravel and ash with 2cm of topsoil with rootlets at surface (MADE GROUND) 2. Orange-brown plastic gravelly CLAY 3. CLAY with weathered sandstone to sandstone bedrock at base of pit. Trial pit terminated at 1.80 mbgl on refusal	a. No odour or staining evident	<u>PID RESULTS</u> 0.5m - 21.5 ppm 1.0m - 7 ppm 1.5m - 4.2 ppm 1.8m - 4.2 ppm <u>SOIL SAMPLES</u> MSTP117-0.5m

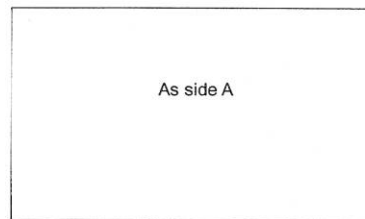
Job Title:	SOIL & GROUNDWATER INVESTIGATION	
Location:	LLANDARCY REFINERY	
Client:	BP LLANDARCY	
Job No:	39991-001-401	DRAFT

TRIAL PIT NUMBER: MSTP118
 GROUND ELEVATION: -
 DATE OF EXCAVATION: 3/6/98
 WATER LEVEL: DRY
 LOGGED BY: RC
 APPROVED BY:

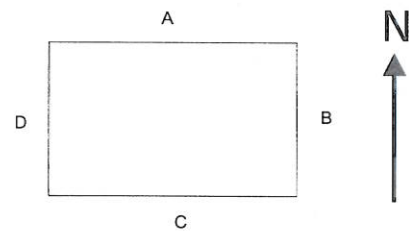
SIDE ELEVATIONS



SIDE C



PLAN



0 1 2m
 Vertical Scale

Key:

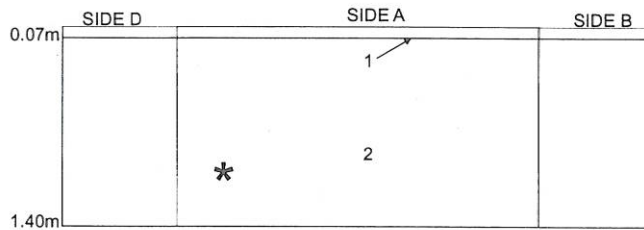
- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- ⇒ Water Ingress

STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Black peaty silty CLAY (TOPSOIL) 2. Loose brown SAND with some fine sub-rounded gravel (MADE GROUND) cobbles of weathered bedrock at 0.6m 3. Weathered sandy CLAY with sub-rounded gravel, silty lenses and and fragments of sandstone bedrock. Trial pit terminated at 1.50 mbgl on refusal	a. Slightly damp in silty lenses at 1.0m	<u>PID RESULTS</u> 0.5m - 0.7 ppm 1.0 - 0.3 ppm <u>SOIL SAMPLES</u>

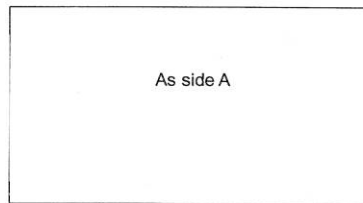
Job Title: SOIL & GROUNDWATER INVESTIGATION	
Location: LLANDARCY REFINERY	
Client: BP LLANDARCY	
Job No: 39991-001-401	DRAFT
 DAMES & MOORE	

TRIAL PIT NUMBER: MSTP119
GROUND ELEVATION: -
DATE OF EXCAVATION: 3/6/98
WATER LEVEL: DRY
LOGGED BY: RC
APPROVED BY:

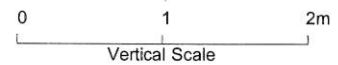
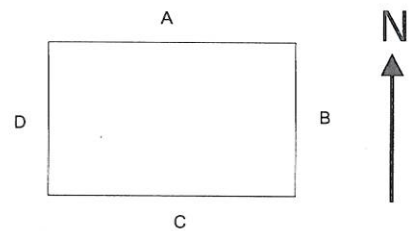
SIDE ELEVATIONS



SIDE C



PLAN



Key:

- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- ➔ Water Ingress

STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Compacted GRAVEL with large cobbles (MADE GROUND) 2. Large sub-angular cobbles of CONCRETE and weathered bedrock fragments (MADE GROUND) Some slightly clayey lenses at 0.8m Trial pit terminated at 1.4 mbgl on refusal	a. Black staining and odour at 1.0m and 1.4m b. Hard to excavate by 1.2m	<u>PID RESULTS</u> 0.5m - 0.7 ppm 1.0m - 8.4 ppm 1.4m - 7.0 ppm <u>SOIL SAMPLES</u> MSTP119-1.0m

Job Title: **SOIL & GROUNDWATER INVESTIGATION**

Location: **LLANDARCY REFINERY**

Client: **BP LLANDARCY**

Job No: **39991-001-401**

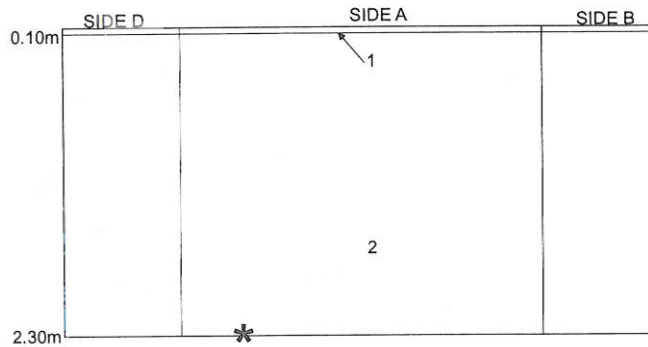
DRAFT



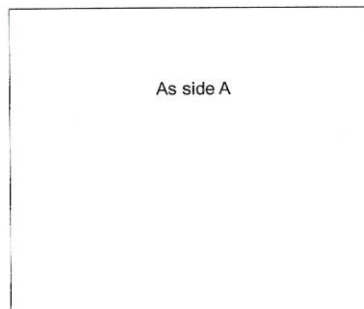
DAMES & MOORE

TRIAL PIT NUMBER: MSTP125
 GROUND ELEVATION: -
 DATE OF EXCAVATION: 3/6/98
 WATER LEVEL: DRY
 LOGGED BY: RC
 APPROVED BY:

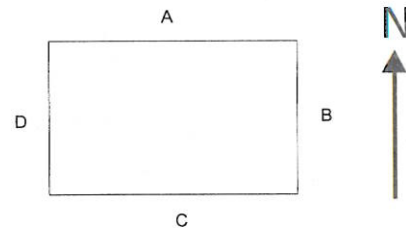
SIDE ELEVATIONS



SIDE C



PLAN



0 1 2m
 Vertical Scale

Key:

- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- Water Ingress

STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Compacted HARDCORE with loose soft brown silt and rootlets with some vegetation at surface (MADE GROUND) 2. Loose light brown very sandy GRAVEL with boulders of weathered bedrock Trial pit terminated at 2.30 mbgl on refusal	a. No odour or staining evident	<u>PID RESULTS</u> 0.5m - 0.4 ppm 1.0m - 0.4 ppm 1.5m - 0.4 ppm 2.0m - 0.4 ppm 2.3m - 0.4 ppm <u>SOIL SAMPLES</u> MSTP125-2.3m

Job Title: SOIL & GROUNDWATER INVESTIGATION

Location: LLANDARCY REFINERY

Client: BP LLANDARCY

Job No: 39991-001-401

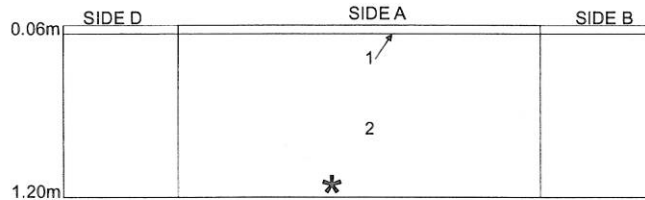
DRAFT



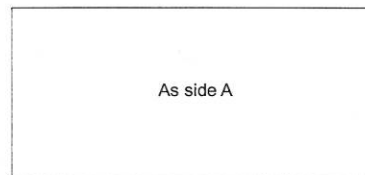
DAMES & MOORE

TRIAL PIT NUMBER: MSTP128
 GROUND ELEVATION: -
 DATE OF EXCAVATION: 3/6/98
 WATER LEVEL: DRY
 LOGGED BY: RC
 APPROVED BY:

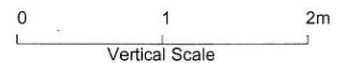
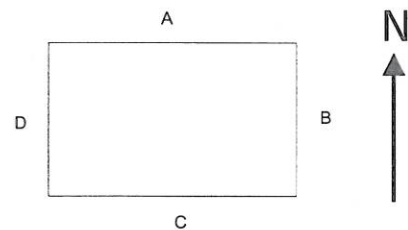
SIDE ELEVATIONS



SIDE C



PLAN



Key:

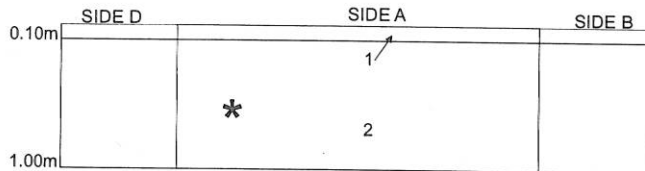
- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- Water Ingress

STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Coarse limestone GRAVEL (MADE GROUND) 2. Loose black ashy GRAVEL with building rubble and lenses of coarse sand (MADE GROUND) fragments of weathered bedrock at approximately 1m Trial pit terminated at 1.20 mbgl on refusal	a. Slightly damp at 0.5m	<u>PID RESULTS</u> 0.5m - 8.5 ppm 1.0m - 19 ppm 1.2m - 14.8 ppm <u>SOIL SAMPLES</u> MSTP128-1.0m

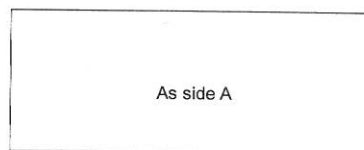
Job Title:	SOIL & GROUNDWATER INVESTIGATION	
Location:	LLANDARCY REFINERY	
Client:	BP LLANDARCY	
Job No:	39991-001-401	DRAFT
 DAMES & MOORE		

TRIAL PIT NUMBER: MSTP133
 GROUND ELEVATION: -
 DATE OF EXCAVATION: 3/6/98
 WATER LEVEL: DRY
 LOGGED BY: RC
 APPROVED BY:

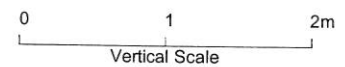
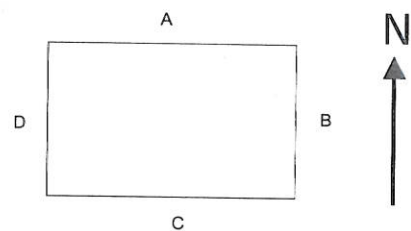
SIDE ELEVATIONS



SIDE C



PLAN



Key:

- * Soil Sample location
- WA Water Sample
- HS Headspace Analysis
- ➔ Water Ingress

Job Title: **SOIL & GROUNDWATER INVESTIGATION**

Location: **LLANDARCY REFINERY**

Client: **BP LLANDARCY**

Job No: **39991-001-401**

DRAFT



DAMES & MOORE

STRATA DESCRIPTIONS	COMMENTS	SAMPLES
1. Compacted GRAVEL (MADE GROUND) 2. Black GRAVEL (MADE GROUND) large blocks of weathered bedrock at 0.7m Trial pit terminated at 1.00 mbgl	a. Black staining b. Very slightly damp at 1.0m c. Trial pit terminated at 1m due to continual collapse of pit walls	<u>PID RESULTS</u> 0.5m - 0.7 ppm 1.0m - 0.3 ppm <u>SOIL SAMPLES</u>

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: WSMW033		PAGE 1 of 2	
	NUMBER	TYPE					DRILLING DATES: 09/12/2003		DRILLING METHODS : Beretta - Various	
							DRILLER : APEX - Rhymal		BOREHOLE DIAMETER : 100-115mm	
							LOGGED BY : SS		SCREEN TYPE & DIAM: 50mm HDPE	
							CHECKED BY : SG		SCREEN SLOT SIZE: 1mm	
							DESCRIPTION	COMMENTS	S,V	
			*1.9		0.0		Loose, dark brown, sandy SILT with abundant sandstone cobbles.	Dry-damp. NVO	0,0	
	SPT - 0.5m 7,/10,9,12,1 1 (N=42)		*2.2		0.5					
					1.0		With increasing fine-coarse gravel.	Dry. NVO	0,0	
	SPT - 1.5m 2,4/5,3,4,4 (N=16)		*1.4		1.5		With increasing sand becoming: loose, dark brown, silty, fine to medium sand with occasional gravels and sandstone cobbles.		0,0	
			*2.4		2.0				0,0	
	SPT - 2.5m 3,3/6,8,5,6 (N=25)		*2.3		2.5				0,0	
			*2.1		3.0			Dry-damp. NVO	0,0	
	SPT - 3.5m 0,1/3,2,3,3 (N=11)		*2.5		3.5			Damp. NVO	0,0	
	WSMW033 - 4.0m (S,L)				4.0		Becoming medium dense, brown with yellow brown mottling, slightly gravelly, silty sand with cobbles.	Wet in gravelly patches, slight non-hydrocarbon odour	0,0	
	SPT - 4.5m 8,5/3,3,7,12 (N=25)				4.5			Damp-wet. NVO	0,0	
					5.0					
LOCATION / NOTES:						LEGEND		BOREHOLE LOG		
NVO = No visual or olfactory evidence of contamination S,V = Contamination Observations S - Odour score (0-5) V - Visual score (0-5)						Disturbed Sample		Job Title: BP Llandarcy Whole Site Investigation		
						Undisturbed Sample		Location: BP Llandarcy Refinery		
						Headspace Analysis		Client: BP/WDA		
						Down Borehole Analysis				
						Groundwater Table		App'd:	Date: December 2003	
						Perched Water Table		Drawn : SS	Ref:	
								Scale: As scale	Job No: 39991-044-785	
								Drg. Size: A4	BOREHOLE LOG	