							CB-254
DRILLING LOG DIVIS		INSTALLATION				SHEET	1
l N	lorth Atlantic Division		Atlantic — Pt	nıladelphia	B. H. Bar A 1000 Box	OF 1	SHEETS
1. PROJECT  Delaware River Channel Deepening	s Study		D TYPE OF BIT	HOURS /PP.	Roller Bit & NXM Bit		
2. LOCATION (Coordinates or Station)	j Sludy	11. DATUM F	OR ELEVATION S	HOWN (TBM or	MSL)		
Deleware River N 348,834.5 E	224.069.9		TURER'S DESIGNA	ATION OF DRILL	1		
3. DRILLING AGENCY			Mounted Mob		-		
Warren George Inc		13. TOTAL N	O. OF OVERBURD		DISTURBED	UNDISTURBED	
HOLE NO. (As shown on drawing title and file number)		SAMPLES	S TAKEN		:	:	
5. NAME OF DRILLER	CB-254	14. TOTAL N	UMBER CORE BOX	KES			
Mike McCarthy		15. ELEVATIO	N GROUND WATE	R			
6. DIRECTION OF HOLE		16. DATE HO	16	; STAI		MPLETED	
VERTICAL INCLINED	DEG. FROM VERT.	10. DATE HO			8-8-1996	8-8-1	996
7. THICKNESS OF OVERBURDEN	0.6'	17. ELEVATIO	N TOP OF HOLE		-43.4		
	8.9'		ore recovery f				8.2 ft
8. DEPTH DRILLED INTO ROCK		19. SIGNATUI	re of inspector	}			
9. TOTAL DEPTH OF HOLE	9.5 ft.		CARE	DAY AD	S. Krajnik  REMARKS		DI OW
ELEVATION DEPTH LEGEND	CLASSIFICATION OF MATERIALS		CORE RECOV-	BOX OR Sample	(Drilling time, water loss,	, depth	BLOW COUNT
a   b   c	(Description) d		ERY e	NO. f	weathering, etc., if signi	ificant)	PER 0.5'
-43.4 <u>0.0</u> 0.0	SAND & GRAVEL		No	-	,		-
			Recovery				
-44 MB	GNEISS, Hornblende-Plagioclase with		86.5%	R-1	6min/ft; Natural fract	ures	
<b>I</b>	minor amounts of Quartzite & Biotite,			" '	noted in depth columi	n	
1   MB   1   / /	gray-black, hard, dense, fine-grained	,			numerous mechanical		
-45	has somewhat salt & pepper				also present and attri	buted to	
2 2 - //-	appearance, limeation varies from 45				drilling operations		
	degrees to 60 degrees, most breaks o	are					
-46-	essentially horizontal and are MBs						
<b>1 1</b> 3 1 (-//)							
l 1							
-47 MB							
-48 - WB - 1							
<b>l</b>					Coreloss zone @ -48.	.3° and	
_49 MB = 1 - ///					-49.0'		
I "-			100%	R−2	26 min for last 3.7'		
			100%	K-2	20 111111 101 1431 3.7		
-50- NB -1/-							
-3º7_MB -7',\///							
-51-1 MB -1 // \							
<b> </b>							
-52							
MB 9-1///							
	Bottom of Hole ❷ −52.9 below MLW						
					1		
					1		

								Hole No.	CB-255
DRILLI	NG LOG		/ISION	INSTALLATION				SHEET	1
1. PROJECT			North Atlantic Division	-	Atlantic – Pl	niladelphia	D II D'I A MVII D'I	OF 1	SHEETS
Delaware Riv	er Channe	l Deenenir	na Study		D TYPE OF BIT FOR ELEVATION S	HOWN (TDM A	Roller Bit & NXM Bit		
2. LOCATION (Coord	linates or Stati	ion)	ig olda/	HIN DATOM	OR ELEVATION 3	N MEET PAWOR	mol)		
Deleware Riv	er N 349		E 224,613.5		CTURER'S DESIGN	ATION OF DRIL	L		
3. DRILLING AGENCY					Mounted Mot				
Warren Geor 4. HOLE NO. (As st		na 1911 and		13. TOTAL N	O. OF OVERBURD S TAKEN	EN	DISTURBED	UNDISTURBED	
file number)	nown on arawi	ny mie ana	CB-255			WFC	:	<u> </u>	
5. NAME OF DRILLE	R				UMBER CORE BO				
Mike McCart				15. ELEVATIO	ON GROUND WATE		RTED : COI	MPLETED	
6. DIRECTION OF HO	DLE	1		16. DATE HO	OLE	SIA	8-9-1996	8-9-1	996
VERTICAL VERTICAL		INCLINED	DEG. FROM VERT.		ON TOP OF HOLE		-41.6		
7. THICKNESS OF 0			2.7'	18. TOTAL C	ORE RECOVERY F	OR BORING			9.3 ft
8. DEPTH DRILLED I			10.5'	19. SIGNATUI	re of inspector	₹			
9. TOTAL DEPTH OF	HOLE		13.2 ft.				S. Krajnik		
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d		CORE RECOV- ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, weathering, etc., if signi	depth ficant)	BLOW COUNT PER 0.5' h
-41.6 _	0.0 _	Hi	SILT		No	<del>-</del>	Natural fractures		
-42	-	1			Recovery		noted in depth column	n	
] -	] -	]					numerous mechanical	fractures	
_	1 <u>-</u>						also present and attri	buted to	
-43-	-	100	SAND & GRAVEL				drilling operations		
-		20m	2						
_	2-	•	4						
<del>-44 -</del>	-								
-		/	GNEISS, Hornblende-Plagioclase,		88.6%	R-1	1		
_	MB -	1///	Hard, Dense, Dark Gray to Black						
<b>-4</b> 5	MB -		],						
-	MB ,-	1/21//	(hard, slightly weathered, moderately						
_ =	MB +	\ \ ///	fractured)						
-46		///\	1						
	/	1///							
	<b>-</b>	15//					Coreloss zone -46.7'	to -47.7'	
<b>-47</b> —	-								
_		//-	$\lambda$						
- -48			Л						
<del>-40 -</del>	MB_		1						
_	<u>ہے</u>	///							
-49-	MB -	<b>/</b> -':							
-45	МВ	!' <i>\'\\</i>	1						
_	8		1						
-50	<b>—</b> -	//- ` -	.]						
-	-	('-'/	1						
_	9_	L <i>Y//</i>	A						
-51 <del></del>	-								
	MB -	///	1						
-	<b>→</b> 10−	- '-/	4						
-52 <del></del>	MB _	1///	1						
_	/ :	///	]						
_	<b>/</b> 11–	1//							
-53-		<i>∖ ///</i>	1						
		///	1						
_	12-	1/1/	3						
-54	ND -	15//	3						
]	MB -		$\langle  $						
_	13-	//-							
			Bottom of Hole @ -54.8 below MLW						

							Hole No.	CB-256	
DRILLI	NG LOG			INSTALLATIO		DI II I . I	SHEET	1	
1. PROJECT		<u>  N</u>	North Atlantic Division		Atlantic - ND TYPE OF		phia of 1	SHEETS	
Delaware 1	River Cha	nnel Dee	pening Study				(TBM or MSL)		
2. LOCATION (Co	ordinates or	Station)		MLW					
Deleware   3. DRILLING AGE		348,939.0	0 E 225,062.0		ACTURER'S DE		DF DRILL		
Warren Ge			•		B-61 Ba NO. OF OVER		: DISTURBED : UNDISTUR	BED	
4. HOLE NO. (As file number)	s shown on	drawing title	e and	SAMPLE	S TAKEN				
5. NAME OF DRI	IIED		CB-256	14. TOTAL	NUMBER COR	E BOXES			
Mike McCo				15. ELEVAT	ION GROUND				
6. DIRECTION OF	HOLE			16. DATE H	HOLE	STA	RTED COMPLETED 8-8-1996 8-8-	.1996	
∨ERTICAL		INCLINED	DEG. FROM VERT.	17. ELEVAT	ION TOP OF	HOLE	<del>-47.2</del>	1330	
7. THICKNESS O	F OVERBURDE	:N	-		CORE RECOVE			ft	
8. DEPTH DRILLE		(	_	19. SIGNATURE OF INSPECTOR					
9. TOTAL DEPTH	OF HOLE		0.0 ft.	S. Krajnik					
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	HALS CORE BOX OR REMARKS RECOV- SAMPLE (Drilling time, water loss, depth ERY NO. weathering, etc., if significant) e f					
							This boring was not completed because initial		
							probing indicated that the		
							existing river bottom was		
							below the proposed dredging elevation.		
							droughing clovation.		

								Hole No.	CB-257
DRILLI	NG LOG	DIVIS		INSTALLATION		الماساء اساداد		SHEET	1
1. PROJECT		Į N	orth Atlantic Division		Atlantic — PI D TYPE OF BIT		Roller Bit	OF 1	SHEETS
Delaware Riv	er Channe	l Deepening	3 Study		FOR ELEVATION S				
2. LOCATION (Coord	inates or Stati	ion)		MLW					
Deleware Riv 3. Drilling Agency		,462.8 L	229,475.9		CTURER'S DESIGN		_		
Warren Georg					Mounted Mot 0. OF OVERBURD		: DISTURBED	UNDISTURBED	
4. HOLE NO. (As sh		ng title and	:	SAMPLE	S TAKEN		:	:	
file number)  5. NAME OF DRILLER	1		CB-257	14. TOTAL N	UMBER CORE BO	XES			
Mike McCarth				15. ELEVATIO	ON GROUND WATE	R			
6. DIRECTION OF HO				16. DATE HO	OLE	STAF	and the second s	MPLETED	1000
<b>⊠</b> VERTICAL		INCLINED	DEG. FROM VERT.	17 FLEVATION	ON TOP OF HOLE	:	8-12-1996 -41.3	8-12-	1996
7. THICKNESS OF O	VERBURDEN		5.7'		ORE RECOVERY F		-41.3		0.0 ft
8. DEPTH DRILLED II	NTO ROCK		2.4°		RE OF INSPECTOR				0.0 11
9. TOTAL DEPTH OF	HOLE		8.1 ft.	, , , , , , , , , , , ,			S. Krajnik		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS		CORE Recov-	BOX OR Sample	REMARKS (Drilling time, water loss	. depth	BLOW COUNT
	b.		(Description)		ERY	NO.	weathering, etc., if sign		PER 0.5'
-41.3 -	0.0 _		SAND & GRAVEL or Friable Bedrock,		No No	<u>f</u>	4min for 4.3', 4min	for 7 p'	"
]	=		bouncy drilling		Recovery		4min for 4.5, 4min	1UT 3,0	
-42			· · ·						
1 -	1-								
I I	_ _								
-43	_								
1 1									
-44	_								
I - <del></del>	_ 3_								
1 7									
-45	_								
1 =	4-								
]	-								
-46	-								
1 7	5-								
	-								
-47	_								
_	<del>-</del>		Cuttings for last 2' indicate						
<b> </b>	_		fine grained sand & mica w/some bl mineral either biotite or hornblende,	ack					
-48	7		Rock may be <b>9</b> -45.0' but more						
			probably @ -47.0'						
-49	_		(Not confirmed, if present then weath	ered)					
~~-	8-								]
			Bottom of Hole @ -49.4 Below MLW						
			NOTE D						
			NOTE: Boring CB—256 was not dril	led.					
		I			I	I	I		ı

							Hole No.	CB-258
DRILLI	NG LOG		SION	INSTALLATIO		DI II I . I	SHEET	1
1. PROJECT		<u>  N</u>	North Atlantic Division		Atlantic - ND TYPE OF		phia   OF 1 NXM Bit	SHEETS
Delaware 1	River Cha	nnel Dee	pening Study				(TBM or MSL)	
2. LOCATION (Co	ordinates or	Station)		MLW				
Deleware  3. DRILLING AGE		359,658.0	0 E 241,024.0		ACTURER'S DE		OF DRILL	
Warren Ge				MODILE 13. TOTAL	B-61 Ba	rge mia Burden	: DISTURBED : UNDISTURI	BED
4. HOLE NO. (A:	shown on	drawing title	and :	SAMPLE	S TAKEN			
file number) 5. NAME OF DRI	I I ED		CB-258	14. TOTAL	NUMBER COR	E BOXES		
Mike McCo				15. ELEVAT	TON GROUND	WATER		
6. DIRECTION OF	HOLE			16. DATE I	HOLE	STA	RTED COMPLETED 8-8-1996 8-8-	1006
∨ERTICAL		INCLINED	DEG. FROM VERT.	17 FLEVAT	ION TOP OF	HOLF	-47.1	1330
7. THICKNESS O	FOVERBURDE	:N	_		CORE RECOVE			ft
8. DEPTH DRILLE		(	_		URE OF INSPI			
9. TOTAL DEPTH	OF HOLE		0.0 ft.	S. Krajnik				
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	KECOV-   SAMPLE   (Drilling time, water loss, depth				
a	ь	С	(Description) d		ERY e	NO. f	weathering, etc., if significant) g	PER 0.5'
							This boring was not	
1							completed because initial probing indicated that the	
							existing river bottom was	
							below the proposed	
							dredging elevation.	

								<u>Hole No.</u>	CB-259
DRILLIN	NG LOG	DIVIS		INSTALLATION				SHEET	1
	110 200	N	lorth Atlantic Division		Atlantic – Pl			OF 1	SHEETS
1. PROJECT	01		CL 1		D TYPE OF BIT		Roller Bit		
Delaware Rive 2. LOCATION (Coordi	er Channel	neebeuing	Study		OR ELEVATION S	HOWN (TBM or	MSL)		
Deleware Rive	or N 360	on) 1255 F	241 901 8	MLW	CTURER'S DESIGN	ATION OF DOLL			
3. DRILLING AGENCY	- 11 300	,120.0 L	241,301.0		Mounted Mot				
Warren Georg				13. TOTAL N	O. OF OVERBURD	EN EN	: DISTURBED :	UNDISTURBED	
4. HOLE NO. (As she	own on drawi	ng title and		SAMPLES	TAKEN				
file number)			CB-259	14. TOTAL N	UMBER CORE BOX	KES			
5. NAME OF DRILLER				15. FLEVATIO	N GROUND WATE	'R			
Mike McCarth  6. DIRECTION OF HO	ny No					: STAR	TED : COM	PLETED	
6. DIRECTION OF HO		INCLINED	THE PROPERTY OF THE PROPERTY O	16. DATE HO	LE	:	8-12-1996	8-12-1	1996
		INCLINED	DEG. FROM VERT.	17. ELEVATIO	N TOP OF HOLE		-45.3		
7. THICKNESS OF OV				18. TOTAL C	ORE RECOVERY F	OR BORING			0.0 ft
8. DEPTH DRILLED IN	NTO ROCK		-	19. SIGNATUI	RE OF INSPECTOR	1			
9. TOTAL DEPTH OF	HOLE		2.7 ft.				S. Krajnik		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS		CORE RECOV-	BOX OR Sample	REMARKS	denth	BLOW COUNT PER 0.5'
			(Description)		ERY	NO.	(Drilling time, water loss, weathering, etc., if signifi	icant)	PER 0.5'
-45.3 -	ь 0.0 _	C (1) (1) (10)	CAND & CDAVE		8	f	l g		h
-40.0	U.U _		SAND & GRAVEL		No	-	5" casing sunk to -45	o.o under	
-46	-				Recovery		its own weight. Drilling resistance very irregula		
<b>I</b> ~~~ 1	1						i colorunce very irregula	"	
1 7	_								
-47-	_								
<b>I</b> <sup>─*</sup> ′¬									
1 1									
<b>l</b> "-	_								
-48			Bottom of Hole @ -48.0 below MLW						
			NOTE: Boring CB—258 was not dril	led.					
<b> </b>									
<b> </b>									
<b> </b>									
			1				I		

							<u>}</u>	<u>lole No.</u>	CB-260
DRILLI	NG LOG	DIVIS		INSTALLATION				SHEET	1
	110 200	N	lorth Atlantic Division		<u> Atlantic – Pt</u>	<u>niladelphia</u>		OF 1	SHEETS
1. PROJECT	01		CL 1		D TYPE OF BIT		Roller Bit & NXM Bit		
Delaware Riv 2. LOCATION (Coordi	er Channe	Deepenino	Study		OR ELEVATION S	HOWN (TBM o	r MSL)		
Deleware Riv			242 631 8	MLW	CTURER'S DESIGNA	ATION OF DRIE	1		
3. DRILLING AGENCY		,032.4 L	242,031.0		Mounted Mob		L		
Warren Georg					O. OF OVERBURD		: DISTURBED : U	NDISTURBED	
4. HOLE NO. (As sh		ng title and	:	SAMPLES			BIOTORIDED	NDIO I ONDED	
file number)			CB-260	14. TOTAL N	UMBER CORE BOX	KES	<u>`</u>		
5. NAME OF DRILLER				<b>——</b>	ON GROUND WATE				
Mike McCarth				10. ELEVANO	AL OROGINA HAIL		RTED : COMPI	FTFD	
6. DIRECTION OF HO				16. DATE HO	)LE		8-12-1996	8-12-1	996
∨ERTICAL		INCLINED	DEG. FROM VERT.	17. ELEVATIO	ON TOP OF HOLE		-44.7		
7. THICKNESS OF O	VERBURDEN		2.3'	18. TOTAL C	ORE RECOVERY F	OR BORING			3.0 ft
8. DEPTH DRILLED II	NTO ROCK		8.0°		RE OF INSPECTOR				0.0
9. TOTAL DEPTH OF	HOLE		10.3 ft.	]			S. Krajnik		
FIENATION	DEDTIL	LEOFNE	CLASSIFICATION OF MATERIALS		CORE	BOX OR	REMARKS		BLOW
ELEVATION	DEPTH	LEGEND	(Description)		RECOV- ERY	SAMPLE NO.	(Drilling time, water loss, d weathering, etc., if significe		COUNT PER 0.5'
-44.7 -	b	C C	d		8	f	g	•	h
-44./ - -45-	0.0 _		SILT		No	-	Drill String sunk to -45	.6	
<b>l</b>	-				Recovery		under its own weight		
]	1_	3 - 4 - X3	SAND & GRAVEL						
-46			JANU & UKAYEL		No	-	0.6ft/min		
I ~~~	_		SANDSTONE, Quartzite, Gravel		Recovery	D_1	┪ ′		
1 ]			SANDSTONE, Qualizite, oraver		16.1%	R−1	Drilling was smooth, the	ought to	
<b>I</b> .,,							be rock, switched to NX		
-47	_	- ://	Friable GNEISS; few broken pieces in				probably on cobble Qua		
l d	_	אללין	bottom of bit, moderately to highly w	eathered			which drilled through fr	iable	
	3-		fracturing unknown				gneiss to −52.4		
<del>-48</del>	_	17//					7 10. 1.4 44		
-		[ <i>`-///-</i>					3min 10s - 1st foot		
1 1	4-	///、、					2min - 2nd foot 1.5min - 3rd foot		
-49							1.5min - 3rd 1001		
1 ]	-	('-'//					3min 15s - 5th foot		
1 -	5	<i>'\\\\</i>					4min 25s - 1.2 feet		
-50-	-						4111111 253 - 1.2 1661		
1 1	_						Extensive core loss attri	buted	
-	6-	ミラン					to rock quality		
_51 <del>_</del>	• -								
<b>I</b> "⊣		'/// <u>\</u>							
1 ]	<b>,</b> -	(/-							
-52-	_	\///-							
<b>I</b> ∃	_	(	GNEISS, Hornblende-Plagioclase, hard,		69%	R-2	Natural fractures		
<b>I</b> ∃	8-	レリ//	brittle, lineation varies from 60 degre		""	"	noted in depth column		
-53	∕MB -		to almost vertical, longest piece 0.3'				numerous mechanical f	ractures	
<b>I</b> −†	MB =	(-i/					also present and attrib		
<b>I</b> ∄	<b>_</b> _e	L' - 1/	GNEISS, longest piece 0.8'		84.6%	R-3	drilling operations		
-54-	_ =	,	oneloo, longool place olo		04.0%	<sup>~-</sup> 3	-		
1 -	// -	///	0.2' left in hole						
I ⅓	<u> 10−</u>	V-1/	35.1 115.15						
-55	_	1/1//	Bottom of Hole @ -55.0 below MLW						
			BOHOIII OF HOIC & -33.0 DEIOW MLW						

									Hole No.	CB-261
DRILLI	NG LOG		SION	<b></b>	INSTALLATION		DI 11 I . I		SHEET	1
1. PROJECT		<u>   N</u>	North Atlantic C	Division		Atlantic -			OF 1	SHEETS
	River Cha	nnel Dee	pening Study			ND TYPE OF FOR ELEVATION		NXM Bit		
2. LOCATION (Co	ordinates or	Station)			MLW	TON ELEVAN	on onomi (	(IDM OI MOL)		
Deleware I 3. DRILLING AGE	River N	360,544.	0 E 242,420	0.0	1	ACTURER'S DE		OF DRILL		
Warren Ge						B-61 Ba NO. OF OVER		DISTURBED	UNDISTURB	FD
4. HOLE NO. (As	s shown on	drawing title	e and		SAMPLI	S TAKEN	DONDEN	BISTORBED	i	
file number) 5. NAME OF DRI				CB-261	14. TOTAL	NUMBER COR	BOXES			
Mike McCa					15. ELEVA	TON GROUND	WATER			
6. DIRECTION OF	HOLE				16. DATE I	HOLE	STA	RTED	COMPLETED	1000
∨ERTICAL		INCLINED		DEG. FROM VERT.		TION TOP OF	:	8-8-1996 -50.3	8-8-1	1996
7. THICKNESS O	F OVERBURDE	:N		_		CORE RECOVE			)	ft
8. DEPTH DRILLE	D INTO ROCK	(		-		URE OF INSPI		MINO .		"
9. TOTAL DEPTH	OF HOLE			0.0 ft.				S. Krajnik		
ELEVATION	DEPTH	LEGEND	CLAS	SIFICATION OF MATERIALS		CORE RECOV-	BOX OR SAMPLE	REMARKS (Drilling time, water	loss, depth	BLOW COUNT
a	ь	C		(Description) d		ERY	NO.	(Drilling time, water weathering, etc., if	significant)	PER 0.5'
				₹		_		This boring was	not	- "
								completed becar	use initial	
								probing indicate		
								existing river be below the prope		
								dredging elevation		
								arouging olovan	····	

									Hole No.	CB-262
DRILLI	NG LOG	D	vision North Atlantic Div	ision	INSTALLATION North	tlantic – Pl	niladelphia		SHEET OF 1	1 Sheets
1. PROJECT		<u> </u>	MOTHI AHAMMO DIV	101011		TYPE OF BIT	ilidadipilia	NXM Bit		JILLIJ
Delaware Riv	er Channe	el Deepeni	ing Study			OR ELEVATION S	HOWN (TBM o			
2. LOCATION (Coord			F 242 007 0		MLW					
JEIEWATE KIV  3. DRILLING AGENCY		7,059.8	E 242,993.9			turer's design Mounted Mot		L		
Warren Geor						O. OF OVERBURD		: DISTURBED	UNDISTURBED	
4. HOLE NO. (As st file number)		ing title and		CB-262	SAMPLES	TAKEN		:	<u>:</u>	
5. NAME OF DRILLE	R			OD-202	<u> </u>	JMBER CORE BO				
Mike McCartl					15. ELEVATIO	N GROUND WATE		nern .	· COMPLETED	
6. DIRECTION OF HO	DIE	] INCLINED		DEG. FROM VERT.	16. DATE HO	LE	: SIA	RTED 8-7-1996	COMPLETED 8-7-1	996
7. THICKNESS OF 0	VERRURDEN			1.8'		N TOP OF HOLE		-44.7		
8. DEPTH DRILLED I				8.5'		ORE RECOVERY F				7.4 ft
9. TOTAL DEPTH OF				9.3 ft.	, 19. SIGNATUR	RE OF INSPECTOR	₹	S. Krajnik		
			Т (	CLASSIFICATION OF MATERIALS		CORE	BOX OR	REMARKS		BLOW
ELEVATION a	DEPTH b	LEGEND	·	(Description)		RECOV- ERY e	SAMPLE NO. f	(Drilling time, water weathering, etc., if		COUNT PER 0.5' h
-44.7 - -45	0.0	1111	SILT	<del>"</del>		No	-	Ť		
<del>-43</del> - -	-	]				Recovery				
- - -	1-		• SAND & GRAVI	EL, possibly friable and	weathered	71.4%	R-1	1		
-46 -	-		Gneiss	, , ,		, , , , ,	" '	2min for -45.7 to		
_			CNEISS—Ougets	ite-Biotite, hard, dense,				2min for -46.7 to 4min for -47.7 to		
_ 47_				zontal to 15 degrees fro				9min for -48.7 to		
- <del>-</del>				.5, essentially horizonal				20min for -49.7 to		
3	<b>–</b>		−48.8; 15 deç	grees from $-48.8$ to $-5$	1.0					
-48-	<u> </u>	\' <i>`&gt;///</i>	4							
_			1							
_	_ +	1// - :	1							
-49	<b>→</b> :		<b>A</b>							
_	_ :	<u> </u>		ion 45 degrees from		96.6%	R-2	Natural fractures		
_	5-	1///		.7, tight fold <b>©</b> −52.8 v	vith			noted in depth col	umn	
-50	) 	/_!-		direction reversed 180 at 45 degrees to bottom	of			numerous mechani		
_	-	11/		osely spaced parallel pla				also present and a	attributed to	
	_ 6	\///	1 1000, 410119 01	oboly opadou parallol pic				drilling operations		
<b>-51</b>		<b>//</b>		uartzite fraction						
_		\		m -47.5 and especially						
_ _52_	<b>~</b>	レン//		ractures are mechanical is 0.6', 0.1' left in hole						
- J2 -	-		longesi piece	is 0.0, 0.1 lett in note	,					
_		<b>/</b> //\	· <b>1</b>							
-53 <del>-</del>	<b>~</b> `.	- /	4							
_	<b>-</b> :	1///								
-	_و	/_//								
-54	-	<u> </u>	Rottom of Hol	e @ -54.0 below MLW						
				O C O II.O BOION MEN						
			1							
			1							
			1							
			1							
			NOTE: Boring	CB-261 was not drilled.						
			1							
			1							
			1							
			1							
			1					1		1

							<u> Hole</u>	No. CB-26
DRILLING	100	DIVIS		INSTALLATION			SHEE	•
	- 100	N	orth Atlantic Division		Atlantic – Pt		OF	1 SHEET
1. PROJECT	^L '	Da	- Ch. A.		D TYPE OF BIT		NXM Bit	
Delaware River 2. LOCATION (Coordinate	Unannel	neebeuind	) Study		OR ELEVATION S	HOWN (TBM or	MSL)	
Deleware River			243.184.2	MLW 12 MANUFAC	TURER'S DESIGNA	ATION OF DOIL		
3. DRILLING AGENCY	11 001,	<u> </u>	210,10112		Mounted Mob		•	
Warren George	Inc			13. TOTAL N	O. OF OVERBURD		DISTURBED UNDISTU	JRBED
4. HOLE NO. (As shown	n on drawin	g title and		SAMPLES	S TAKEN			
file number) 5. NAME OF DRILLER			CB-263	14. TOTAL N	UMBER CORE BOX	ŒS		
Mike McCarthy				15. ELEVATIO	N GROUND WATE	R		
6. DIRECTION OF HOLE				16. DATE HO	1 F	: STAF		
▼ VERTICAL		INCLINED	DEG. FROM VERT.	10. DATE HU	ILE	:		-7-1996
7. THICKNESS OF OVERB	DIIDDEN		6.0'	17. ELEVATIO	N TOP OF HOLE		-47.3	
8. DEPTH DRILLED INTO			4.5		ORE RECOVERY F			2.0 1
				19. SIGNATUI	re of inspector	1	C // * "	
9. TOTAL DEPTH OF HOL	LL I		10.5 ft.		CORE	BOX OR	S. Krajnik T REMARKS	BLOW
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)		RECOV-	SAMPLE	(Drilling time, water loss, depth	COUNT
a	ь	С	(Description) d		ERY e	NO. f	weathering, etc., if significant) g	PER 0.5'
-47.3	0.0	TiT	SILT		No	_		<del>                                     </del>
1	-				Recovery			
<del>-48 </del>	7							
<b>I</b> −	닉							
1 1	-							
-49-	7							
1 7	2-							
1 1	-						Natural fractures	
-50							noted in depth column	
1 ]	3		SAND & GRAVEL		ł		numerous mechanical fractu	
1 =	4		SAND & ONAVEL				also present and attributed	to
-51-	1						drilling operations	
1 1	- 4-7							
<b>I</b> −								
-52-	-							
<b>l</b> "∃	5—							
1 7	1							
-53	-							
<b>I</b> "∃	6-7		ONEIGO D' I'I DI ' I 'II				 	0
-	1	71//	GNEISS—Biotite, Plagioclase with		19%	R−1	Rock loss from -53.3 to -5	JO.0[
-54	7	'///.\ <u> </u>	scattered muscovite mica and green chloritic zones, very soft, saprolitic ca	ın				
<b>I</b> ~~⊣	,‡	/ <u>-</u> !/	be shaved with knife, limeation of	111				
	· -{	12///	mineral somewhat contorted and varie	s				
-55 <del>-</del>	7	\///-	from 45 degrees to vertical dip, fresh					
	<u>, †</u>	/// \ \	appearance, no stains, longest piece					
1 1	Ĭ	1/1/2	0.3', slightly to moderately weathered,	highly				
-56	1		fractured	•				
- <sup>30</sup> - =	드 급	////						
ı ≿	二 门	//-						
I⊑	_	(///						
-57	- "┤	1//						
<b> </b>	10-	<u> </u>						
<b> </b>			Bottom of Hole @ −57.8 below MLW					
<b> </b>								
<b> </b>								
<b> </b>								
<b> </b>								
<b> </b>								
[								

								Hole No.	CB-264
DRILLI	NG LOG	DIVIS		INSTALLATION		. 11		SHEET	1
1. PROJECT		N	lorth Atlantic Division		<u> Atlantic – Pl</u>	niiaaeipnia	Dellas Dit & NVM Dit	OF 1	SHEETS
Delaware Riv	er Channe	l Deepening	s Study		O TYPE OF BIT OR ELEVATION S	HOWN (TRM or	Roller Bit & NXM Bit		
2. LOCATION (Coord	linates or Stati	ion)	, 5,000	MLW	OR ELLYAHON 3	TOWN (IDM O	mot/		
Deleware Riv		,406.0 E	243,779.6		TURER'S DESIGN	ATION OF DRIL			
3. DRILLING AGENCY				Barge I	Mounted Mot	ile B-61			
Warren Geor 4. HOLE NO. (As st				13. TOTAL N SAMPLES	O. OF OVERBURD	EN	DISTURBED	UNDISTURBED	
file number)	iowii dii didwi	ny mie ana	CB-264			WEG.	:	<u>:                                    </u>	
5. NAME OF DRILLE	R			<b>——</b>	UMBER CORE BOX				
Mike McCartl				15. ELEVAIIO	N GROUND WATE		RTED : C	COMPLETED	
6. DIRECTION OF HO	OLE	1		16. DATE HO	LE	: 31AI	8-6-1996	8-6-1	996
VERTICAL VERTICAL		INCLINED	DEG. FROM VERT.	17. ELEVATIO	N TOP OF HOLE		-47.8		
7. THICKNESS OF O			3.2'	18. TOTAL C	ORE RECOVERY F	OR BORING			2.0 ft
8. DEPTH DRILLED II			3.83	19. SIGNATUI	re of inspector	₹			
9. TOTAL DEPTH OF	HOLE	_	7.0 ft.				S. Krajnik		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS		CORE RECOV-	BOX OR Sample	REMARKS (Drilling time, water los		BLOW COUNT
	ь	。	(Description) d		ERY e	NO.	weathering, etc., if sig		PER 0.5' h
-47.8 <sub>-48</sub>	0.0 _		SAND & GRAVEL to -51.0 then weather		No	<u> </u>	1min for first 3.2'		
<b>I</b> ⊸~⊣	-		fractured GNEISS as indicated by cutt		Recovery		6min for next 1.4'		
-	_		return water to −52.4	-			Roller-Bit drilling to	-52.4'	
-49	1-						1		
I "⊣	-								
_	_								
-50-	2								
"	_								
=	_ =								
_51_	3-						Rockcore loss zone	-51.0' to	
	_						-52.4'		
=									
-52	4-								
	_						] .		
-			QUARTZITE-Biotite-Gneiss with		83%	R−1	10 min for last 2.4'		
-53	5-		Plagioclas and scattered pyrites crysto	ils, hard,					
_	_		dense, vertical irregular fractures as noted with gray clay infilling, longest						
-	_		piece 1.5', 0.3' left in hole						
-54	_		(hard, slightly weathered, moderately	to highly					
	_		fractured)	• •					
-	-		•						
	,		Bottom of Hole @ -54.8 Below MLW						
							1		
							1		
							1		
							1		
		Ī	1		I		I		

<u>Hole No.</u> CB-265 DIVISION INSTALLATION SHEET DRILLING LOG North Atlantic Division North Atlantic - Philadelphia 0F SHEETS 1. PROJECT 10. SIZE AND TYPE OF BIT Roller Bit & NXM Bit Delaware River Channel Deepening Study 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) 2. LOCATION (Coordinates or Station) MLW Deleware River N 361,925.3 E 244,558.7 12. MANUFACTURER'S DESIGNATION OF DRILL 3. DRILLING AGENCY Barge Mounted Mobile B-61 Warren George Inc 13. TOTAL NO. OF OVERBURDEN DISTURBED UNDISTURBED 4. HOLE NO. (As shown on drawing title and SAMPLES TAKEN file number) CB-265 14. TOTAL NUMBER CORE BOXES 5. NAME OF DRILLER 15. ELEVATION GROUND WATER Mike McCarthy STARTED COMPLETED 6. DIRECTION OF HOLE 16. DATE HOLE 7-25-1996 7-25-1996 **VERTICAL** DEG. FROM VERT. INCLINED 17. ELEVATION TOP OF HOLE -45.5 2.0 7. THICKNESS OF OVERBURDEN 18. TOTAL CORE RECOVERY FOR BORING 3.0 8. DEPTH DRILLED INTO ROCK 10.0 19. SIGNATURE OF INSPECTOR 9. TOTAL DEPTH OF HOLE 12.0 ft. S. Krajnik CLASSIFICATION OF MATERIALS COUNT PER 0.5' **ELEVATION** DEPTH LEGEND RECOV-SAMPLE (Drilling time, water loss, dept) (Description) NO. eathering, etc., if significant) ERY -45.5 0.0 Unconsolidated SAND & GRAVEL, No 5min for first 2.0' bouncy drilling Recovery Metasedimentary QUARTZITE-Gneiss 45 min for last 10.0° 33% R-1 with Hornblende & Biotite, dark -48minerals, rock is light gray quartz with dark bands, bedding trace or lineation Natural fractures 9 70 degrees, hard, dense but highly noted in depth column -49 fractured due to drilling, all fractures are numerous mechanical fractures fresh breaks due to drilling, longest also present and attributed to piece 0.6' drilling operations -50-Core loss anticipated between -51--47.5 and -54.5; recovered core had extensive mechanical breaks between -54.5 and -57.5 -52-12 Bottom of hole @ -57.5 below MLW

CB-266 Hole No. DIVISION INSTALLATION SHEET DRILLING LOG North Atlantic Division North Atlantic - Philadelphia 0F SHEETS 1. PROJECT 10. SIZE AND TYPE OF BIT Roller Bit & NXM Bit Delaware River Channel Deepening Study 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) 2. LOCATION (Coordinates or Station) MLW Deleware River N 362,409.5 E 245,239.9 12. MANUFACTURER'S DESIGNATION OF DRILL 3. DRILLING AGENCY Barge Mounted Mobile B-61 Warren George Inc 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN DISTURBED UNDISTURBED 4. HOLE NO. (As shown on drawing title and file number) CB-266 14. TOTAL NUMBER CORE BOXES 5. NAME OF DRILLER 15. ELEVATION GROUND WATER Mike McCarthy STARTED COMPLETED 6. DIRECTION OF HOLE 16. DATE HOLE 7-25-1996 7-25-1996 **VERTICAL** ☐ INCLINED DEG. FROM VERT. 17. ELEVATION TOP OF HOLE -45.4 7. THICKNESS OF OVERBURDEN 4.6 18. TOTAL CORE RECOVERY FOR BORING 7.5 8. DEPTH DRILLED INTO ROCK 19. SIGNATURE OF INSPECTOR 9. TOTAL DEPTH OF HOLE 12.1 ft. S. Krajnik CLASSIFICATION OF MATERIALS (Drilling time, water loss, depth weathering, etc., if significant) ELEVATION COUNT PER 0.5' DEPTH LEGEND RECOV-SAMPLE (Description) ERY NO. -45.4 0.0 SAND & GRAVEL, 10min for 4.6 No irregular drilling Recovery -47 -50-Quartzitic GNEISS, light gray, hard, 25 min for 7.5' 22.6% R-1 dense with minor amounts of Hornblende and some very fine mica -51flakes, mostly fragmental recovery, most fractures are fresh due to drilling, slightly brown iron stain at top of core, longest piece 0.4' -52-(hard, moderately weathered) -54--55--57-12-Bottom of Hole ❷ -57.5 below MLW

									H	ole no.	CB-701
DRILLII	NG LOG		SION Lorth Atl	antic Divi		INSTALLATIO	N Atlantic –	Dhiladal		SHEET OF 1	1
1. PROJECT			OTH AIR	annic DIV	ISIOII	_	ATIONTIC -		NXM Bit	<u> </u>	SHEETS
Delaware F	River Chan	nel Dee	pening S	Study			FOR ELEVATION				
2. LOCATION (Co	ordinates or :	Station)				MLW			•		
Deleware R 3. Drilling Agen		υ <u>∠,/</u> 91.	ı EZ	<u>45,737.8</u>			ACTURER'S DE B-61 Ba		DF DRILL		
Warren Ge	orge Inc					13. TOTAL	NO. OF OVER	BURDEN	DISTURBED	UNDISTURBE	ED .
4. HOLE NO. (As file number)	shown on d	rawing title	and :		CB-267		S TAKEN			<u>:</u>	
5. NAME OF DRIL			·		05 207		NUMBER CORI				
Mike McCa 6. DIRECTION OF						_			RTED : C	OMPLETED	
VERTICAL		NCLINED		_	DEG. FROM VE	16. DATE I	HOLE		7-25-1996	7-25-	1996
7. THICKNESS OF					14.6	17. ELEVAT	TION TOP OF		-42.6		
8. DEPTH DRILLEI					0.7'		CORE RECOVE URE OF INSPI		RING		ft
9. TOTAL DEPTH	OF HOLE				15.3 ft.	III. SIGNAI	UKE UF INSPI	CIUK	S. Krajnik		
ELEVATION	DEPTH	LEGEND		CLASSIF	ICATION OF MATERIALS	<u> </u>	CORE RECOV-	BOX OR Sample	REMARKS (Drilling time, water lo	es denth	BLOW COUNT
a	ь	C			(Description) d		ERY	NO. f	weathering, etc., if si	gnificant)	PER 0.5'
<b>-42.6</b> _	0.0	TŤT	Soft SI	LT	u .		•	<u> </u>	<u>g</u>		<del>"</del>
-43	4										
	디										
-44-	Ξ.										
	2										
-45-	<b>1</b>										
<b>l</b> " ‡											
=	3-										
-46 <u>-</u>	7										
]	4-										
-47-	<u>-</u>				SAND & GRAVI	EL,	7.2%	R-1	Hot, Cloudy; Pay	11.0';	
_	5_		rapid o	drilling					bedrock from -5		5.1
-48 <del>-</del>	<u> </u>	• • •							estimated to be f weathered and wa		
	. 📑								washed away; 47		
<u>آ</u> ہے	6	•							11.0'		
-49 <u>-</u>	3										
	7—										
<del>-</del> 50-	<u> </u>	<b>5.</b>									
	8										
-51 <del>-</del>	- [•	52									
]	₹										
_52_	F										
-52	-										
]	10-										
-53 <del>-</del>											
	11—										
-54	7										
]	12										
_ -55	<b>E</b> '										
	<b>_</b>	• •									
	13		<u> </u>								
-5 <del>6 -</del>	#	1//		to dar							
	14-1/	///~			-Hornblende, ve n almost vertic						
-57-	1	///			red with brown						
]	15	\ <i>\\\\</i>	some v	ery fine	mica noted, f						
-	4~``				st piece 0.2'						
			Bottom	ot Hole	• <b>@</b> −56.9 belo	W MLW					

CB-268 Hole No. DIVISION INSTALLATION SHEET DRILLING LOG North Atlantic Division North Atlantic - Philadelphia SHEETS 1. PROJECT 10. SIZE AND TYPE OF BIT NXM Bit Delaware River Channel Deepening Study 11. DATUM FOR ELEVATION SHOWN (TBM or MSL) 2. LOCATION (Coordinates or Station) MLW Deleware River N 362,520.7 E 246,354.6 12. MANUFACTURER'S DESIGNATION OF DRILL 3. DRILLING AGENCY Barge Mounted Mobile B-61 Warren George Inc 13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN DISTURBED UNDISTURBED 4. HOLE NO. (As shown on drawing title and file number) CB-268 14. TOTAL NUMBER CORE BOXES 5. NAME OF DRILLER 15. ELEVATION GROUND WATER Mike McCarthy STARTED COMPLETED 6. DIRECTION OF HOLE 16. DATE HOLE 8-6-1996 8-6-1996 **VERTICAL** ☐ INCLINED DEG. FROM VERT. 17. ELEVATION TOP OF HOLE -43.6 4.0 7. THICKNESS OF OVERBURDEN 18. TOTAL CORE RECOVERY FOR BORING 8. DEPTH DRILLED INTO ROCK 8.1 19. SIGNATURE OF INSPECTOR 9. TOTAL DEPTH OF HOLE 12.1 ft. S. Krajnik CLASSIFICATION OF MATERIALS SAMPLE NO. (Drilling time, water loss, depth weathering, etc., if significant) COUNT PER 0.5' ELEVATION DEPTH LEGEND RECOV-(Description) ERY -43.6 0.0 SAND & GRAVEL 12.1% R-1 (anticipated to extend to a depth of -47.6QUARTZITE, large pieces of Quartzite -48gravel was jammed in bit and it reamed out the boring, no rock recovery, only three pieces of Quartzite gravel recovered -49--51--52--53--55-12-Bottom of Hole @ -55.7 below MLW

						Hole No.	CB-269
	SION	INSTALLATION				SHEET	1
1. PROJECT	North Atlantic Division		lantic – Ph		D-II P!I	OF 1	SHEETS
Delaware River Channel Deepening	a Study	10. SIZE AND	R ELEVATION SE		Roller Bit		
2. LOCATION (Coordinates or Station)		MLW	K LLLYAHON SI	IO MICI (IDM OI	mot/		
Deleware River N 363,336.0	E 246,300.9		URER'S DESIGNA				
3. DRILLING AGENCY Warren George Inc			ounted Mob OF OVERBURDE		: DISTURBED	: UNDISTURBED	
4. HOLE NO. (As shown on drawing title and	:	SAMPLES	TAKEN	LN .	DISTORDED	OMDISTORDED	
file number)	CB-269	14. TOTAL NUM	ABER CORE BOX	ES			
5. NAME OF DRILLER Mike McCarthy		15. ELEVATION	GROUND WATER	?			
6. DIRECTION OF HOLE		16. DATE HOLE	;	STAR		COMPLETED	
VERTICAL INCLINED	DEG. FROM VERT.			<u> </u>	7-25-1996	7-25-1	996
7. THICKNESS OF OVERBURDEN	10.0'	17. ELEVATION			-45.2	•	
8. DEPTH DRILLED INTO ROCK	-		RE RECOVERY FO				0.0 ft
9. TOTAL DEPTH OF HOLE	10.0 ft.	19. SIGNATURE	OF INSPECTOR		S. Krajnik		
ELEVATION DEPTH LEGEND	CLASSIFICATION OF MATERIALS		CORE RECOV-	BOX OR Sample	I REMARKS	loon doubt	BLOW COUNT
	(Description)		ERY	NO.	(Drilling time, water weathering, etc., if	significant)	PER 0.5'
-45.2	SAND & GRAVEL	-	e No	<u>f</u>	Drill Time 12min		h
	Irregular penetration resistance		No Recovery	_	21111 111116 1Z111111		
-46-	egalar ponon anon resistance		,				
-47-	]						
-48-	<u> </u>						
	·						
-49-							
	.]						
-50-							
5-15-15-15-15-15-15-15-15-15-15-15-15-15	]						
-51-							
-52-	:						
	4						
-53							
	4						
-54							
	]						
-55-	1						
10	Bottom of Hole @ -55.2 below MLW	+					
	1						

							Hole No.	CB-270
DRILLI	NG LOG	DIVIS		INSTALLATION			SHEET	1
	NO LOO	N N	orth Atlantic Division	North A	Atlantic – Pl		OF 1	SHEETS
1. PROJECT					D TYPE OF BIT		NXM Bit	
Delaware Riv	er Channe	Deepening	Study	4	OR ELEVATION S	HOWN (TBM or	· MSL)	
2. LOCATION (Coordi Deleware Rive			248,388.9	MLW				
3. DRILLING AGENCY		,300.Z E	240,300.9		cturer's design Mounted Mot		L	
Warren Georg					O. OF OVERBURD		: DISTURBED : UNDISTURBED	
4. HOLE NO. (As sh		ng title and	:	SAMPLES			DISTORDED STREET	
file number)			CB-270	14. TOTAL N	UMBER CORE BOX	XES		
5. NAME OF DRILLER				<b>——</b>	ON GROUND WATE			
Mike McCarth 6. DIRECTION OF HO							RTED : COMPLETED	
				16. DATE HO	OLE		7-30-1996 7-30-	1996
∨ERTICAL		INCLINED	DEG. FROM VERT.	17. ELEVATIO	ON TOP OF HOLE		-44.4	
7. THICKNESS OF O	VERBURDEN		-	18. TOTAL C	ORE RECOVERY F	OR BORING		1.2 ft
8. DEPTH DRILLED IN	NTO ROCK		8.7°		re of inspector			112 "
9. TOTAL DEPTH OF	HOLE		8.7 ft.				S. Krajnik	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS		CORE RECOV-	BOX OR	REMARKS	BLOW COUNT
			(Description)		ERY	SAMPLE No.	(Drilling time, water loss, depth weathering, etc., if significant)	PER 0.5'
	ь 0.0	c	Wanthanad CNFICS faithle weeks		e	f	9	h
	U.U _	1,1//	Weathered GNEISS, friable, washes away in drilling with wobbly drill strin	•	13%	R−1	Flood Tide with Swift Current;	
-45	=	<b>'///</b> >	away in ariiing wiin woodiy anii strin	y,			Bent 4" casing & sheared	
<b>I</b>	1-	(/-!/					one piece partially at joint;	
<b>I</b> ⊢	· -	[12]//					Prevented drilling hole to	
-46-	_	\ <i>///</i>					-55.0 Drilled fairly rapidly to	
]	2_	/// \ \					-51.9 with no recovery	
]								
-47	_	15//						
I "⊣								
1 ]	<u> </u>	//-)						
-48 -48	_	$\langle \langle \rangle \rangle$					l	
<b>-</b> ••° ∃		-//					Coreloss zone -44.4' to -51.8'	
]	4_	ואלין						
<b>I</b> "⊢	-							
-49		K - 1//						
-	5	\`-///-						
]		///、、						
-50-		11.1						
-	6—							
]		/////						
<b>−51</b> −	_	//_`					Natural fractures	
]	7-						noted in depth column	
]	<u>-</u>	ニーノ					numerous mechanical fractures	
-52-	_ =	<i> リ//</i>	At -51.8' becomes hard QUARTZITE,				also present and attributed to	
<b>I</b>	7 =		very hard, dense, badly fractured due				drilling operations	
<b>I</b> →	<u> </u>		drilling, few standard fracture surface	ıs,				
-53-	_	' <i>`\//</i>	longest piece 0.35'					]
			Bottom of Hole @ -53.1 below MLW					

									Hole No.	CB-271
DRILLI	NG LOG	DIVIS	ion Iorth Atlantic Divisi	on.	INSTALLATION	Atlantic – Pt	siladalahia		SHEET OF 1	1 eurre
1. PROJECT		N	OTH Allumic Divisi	ON .		TYPE OF BIT	ilidaeipnia	Roller Bit & NXM		SHEETS
Delaware Riv	er Channe	l Deepening	<b>Study</b>			OR ELEVATION S	HOWN (TBM or		ы	
2. LOCATION (Coord			040 500 4		MLW		•	·		
Deleware Riv 3. Drilling Agency		<u>,946.5 E</u>	249,592.1			TURER'S DESIGNA		T		
Warren Georg						Mounted Mob O. OF OVERBURD		: DISTURBED	: UNDISTURBED	
4. HOLE NO. (As sh		ng title and	:		SAMPLES	TAKEN	Li	DISTORDED	ONDISTORDED	
file number)				CB-271	14. TOTAL N	UMBER CORE BOX	KES			
5. NAME OF DRILLER Mike McCarth					15. ELEVATIO	N GROUND WATE	R			
6. DIRECTION OF HO					16. DATE HO	15	STA	RTED	COMPLETED	
<b>VERTICAL</b>		INCLINED		DEG. FROM VERT.				7-26-1996	7-26-	1996
7. THICKNESS OF O	VERBURDEN			10.6'		N TOP OF HOLE		-4	5.5	40.0
8. DEPTH DRILLED II	NTO ROCK			1.6'		ore recovery f re of inspector				1.6 ft
9. TOTAL DEPTH OF	HOLE			12.2 ft.	19. SIGNATU	LE OF INSPECTOR	•	S. Krajnik		
FLEWATION	DERTH	LECEND	CLAS	SIFICATION OF MATERIALS		CORE	BOX OR	REMA		BLOW
ELEVATION	DEPTH	LEGEND		(Description)		RECOV- ERY	SAMPLE No.	(Drilling time, w weathering, etc.	uier ioss, aepin , if significant)	COUNT PER 0.5'
-45.5 -	ь 0.0 _	0 T-21 200	SAND & GRAVEL,	ranid drilling		e No	f	20min for first		h
-46	-		SAIND & GILAVEL,	rapia ariilliy		No Recovery	_	roller-bit	ro.o using	
	_									
]	1-	700								
-47	_									
]										
_	2									
-48	_									
	7_									
]										
-49-	_									
-	4-									
=	· <del>-</del>	700								
<b>-</b> 50	-									
	5									
- -51-	_									
-31-	-									
_	6_									
-52-	-									
_	_=									
_	7-									
-53	_									
_										
_	-	700								
-5 <del>4</del> -	=									
-	9_							Natural fracture	10	
<u> </u>								noted in depth		
-55 -	_								anical fractures	
_	10							also present an	d attributed to	
- -56	MD =							drilling operatio		
-30-	₩ -	//		zitic GNEISS with		100%	R-1	Lineation incline	d 70°	
=	) 11-	///	bands of Hornbl	ende (dark gray), ver						
-57	MB	(/_/-)	hard, dense, slig	phtly iron stained at to	op					
	MB 12	(!///		vite & pyrite noted, fractures are MBs at						
-		<i>\_///-</i>	top		_			1		
				<b>9</b> −57.7 below MLW						
			Ī				Ī	1		1

								Hole No.	CB-272
DRILLI	NG LOG	DIVIS		INSTALLATION		-!		SHEET	1
1. PROJECT		N	orth Atlantic Division		Atlantic – Pl D TYPE OF BIT	iliaaeipnia	Roller Bit & NXM Bit	OF 1	SHEETS
Delaware Riv	er Channe	l Deepening	study		OR ELEVATION S	HOWN (TBM or			
2. LOCATION (Coord	linates or Stati	on)		MLW					
Deleware Riv 3. Drilling Agency		,828./ E	249,963.0		CTURER'S DESIGN		L		
Warren Geor					Mounted Mot 0. OF OVERBURD		: DISTURBED :	UNDISTURBED	
4. HOLE NO. (As st	nown on drawi	ng title and	i i	SAMPLES					
file number)			CB-272	14. TOTAL N	UMBER CORE BOX	KES			
5. NAME OF DRILLEI John Klinger				15. ELEVATIO	N GROUND WATE	R			
6. DIRECTION OF HO				16. DATE HO	N F	STAI	and the second s	(PLETED	
<b>VERTICAL</b>		INCLINED	DEG. FROM VERT.			:	7-27-1996	7-27-1	1996
7. THICKNESS OF O	VERBURDEN		-		N TOP OF HOLE		-44.0		0.0 #
8. DEPTH DRILLED I	NTO ROCK		12.0'		ore recovery f re of inspector				9.8 ft
9. TOTAL DEPTH OF	HOLE		12.0 ft.	19. SIGNATO	NE OF INSPECTOR	•	S. Krajnik		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS		CORE	BOX OR	REMARKS	donth	BLOW COUNT
			(Description)		RECOV- ERY	SAMPLE No.	(Drilling time, water loss, weathering, etc., if signif	aepin icant)	PER 0.5'
-44.0	ь 0.0	c	Weathered GNEISS, soft, very rapid		e Na	_ f	3min for first 2.0'		h
	-		drilling		No Recovery	_	3111111 101 11131 2.0		
	_		<b>-</b>		,				
-45	1-								
-	-	\' <i>-///-</i>							
		/// \ \							
-46	2	-://	GNEISS-Quartz-Biotite, gray-black,		98%	R-1	0.2' Coreloss at top		
	_	1///	massive, very hard, dense, lineation				41 min for last 10.0'		
-47	MB ,-	/_/-/	varies from vertical to 8 degrees at						
<b>I</b>	-	/ı / ///	back to vertical at -51.0 and 80 deg at -54.0, minor amounts of muscovit				Natural fractures		
	■MBs -	\///-	mica appears locally, moderately	<del>.</del>			noted in depth column	n	
-48	4	(/- \ \ \	fractured to highly fractured between				numerous mechanical		
			-49.0 to -50.0, all fractures are MBs				also present and attri	buted to	
-	_ MR _	1///	to drilling, fractures are predominately				drilling operations		
-49	5-		horizontal to 10 degrees, longest piec	е					
	_ =		11.1						
1	MBs -	/							
-50-	- 6-	1///							
_	MR -	(-1-)							
=	MB _ =	/i / ///							
-51-	MB 7-	\///-							
	WB -								
-52									
-32	MB -								
]	<u> </u>								
-53									
]	MB -	1-1							
-	-	\ <u>\</u> \//							
-54	MB 10								
]	_	K - 1//							
_		\ <i>&gt;///-</i>							
-55-	MB_ 11—	<b>///</b> \ \							
]	-	12/2							
]	_								
-56	12-		Bottom of Hole @ −56.0 below MLW		1				
							1		

							<u>}</u>	<u>lole No.</u>	CB-273
DRILLI	NG LOG	DIVIS		INSTALLATION				SHEET	1
1. PROJECT		N	lorth Atlantic Division		Atlantic — Pt		ADOL DO	OF 1	SHEETS
Delaware Riv	er Channe	l Deenening	n Study		TYPE OF BIT		NXM Bit		
2. LOCATION (Coord	linates or Stati	ou) · neehammi	g olday	11. DATUM F	OR ELEVATION S	HOWN (IBM OF	mol)		
Deleware Riv	er N 366		250,079.2		TURER'S DESIGNA	ATION OF DRIL	L		
3. DRILLING AGENCY				Barge I	Mounted Mob	ile B-61			
Warren Geor 4. HOLE NO. (As st	ge inc		:	13. TOTAL N SAMPLES	O. OF OVERBURD	EN	DISTURBED	INDISTURBED	
file number)	nown on arawi	ng mie ana	CB-273			WPA	<u>:</u>		
5. NAME OF DRILLE	R		. 05 270		UMBER CORE BOX				
Mike McCartl				15. ELEVATIO	N GROUND WATE		37FD	FTFD	
6. DIRECTION OF HO	DLE			16. DATE HO	LE	: 21VI	7-26-1996 COMPI	7-26-1	996
▼ VERTICAL		INCLINED	DEG. FROM VERT.	17. FLEVATIO	N TOP OF HOLE	-	-44.6	7 20 1	330
7. THICKNESS OF O	VERBURDEN		-		ORE RECOVERY F		77,0		4.5 ft
8. DEPTH DRILLED I	NTO ROCK		10.3°		RE OF INSPECTOR				7.0 11
9. TOTAL DEPTH OF	HOLE		10.3 ft.				S. Krajnik		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS		CORE RECOV-	BOX OR Sample	REMARKS (Drilling time, water loss, d	enth	BLOW Count
			(Description)		ERY	NO.	weathering, etc., if significations		PER 0.5'
-44.6	ь 0.0	c	d GNEISS-Quartz-Biotite,		47.79/	f	Complete in the set		h
-44.0 - -45	J 0.0 _	11//	metasedimentary dip 60 degrees to 75	5	43.7%	R−1	Coreloss in top of run probably weathered and		
]	_	V///~	degrees to vertical, gray, very dense,	•			friable and was washed		
]	1-	1/-1/	hard, highly fractured due to wobbly				away due to wobbly dri		
-46	-	[' <i>`\\\</i>	drilling, some fractures lightly stained				string; 50 min for 10.3	,	
<b> </b> "-	-	\ <i>///</i> .`	locally, brown iron stained. Bedding				]		
1 -	2—		trace dips from vertical at -52.0 to (						
-47-	_	/-//	degrees at -54.0, most fractures are						
	_	L <i>\\\((</i>	MBs due to drilling, longest piece 0.6	l					
	3						Natural fractures		
40-	_	1					noted in depth column		
-48	_	トノン					numerous mechanical f		
1 =		1.1//					also present and attribu	uted to	
	*-						drilling operations		
-49	_	/-!-/							
-		// ///							
]	5-	\///-							
-50	_	/// \ \							
-	MB	1/1/2							
	6-	15//							
-51─	-								
_	_	//- /							
	MB 7_	$(\cdot,\cdot)$							
-52	<u></u>	\ //							
]	<u> </u>	///							
]	<b>₩</b> 8-	<u>//-</u> /-)							
-53		K ///							
<b>I</b>	厂/ -	\ <i>`&gt;///-</i>							
]	<u></u>	<i>///</i> \							
-54	MB -	<b>V</b> //・ン							
<b> </b> ~~⊣	MB -								
] ]	MB 10-	<i> }///</i>							
-			Bottom of Hole @ -54.9 Below MLW			<u> </u>			
			DOTTON OF HOLE & -34.9 BEIOW MLW						

							Hole No	o. CB-274
DRILLI	NG LOG	DIVIS		INSTALLATION			SHEET	. 1
	110 200	N	lorth Atlantic Division		<u> Atlantic – Pl</u>	<u>niladelphia</u>	OF	SHEETS
1. PROJECT	Ob.	l Da '	- Ch. A.		D TYPE OF BIT		NXM Bit	
Delaware Riv 2. LOCATION (Coord	er Unanne	n peebeuing	Study		OR ELEVATION S	HOWN (TBM or	· MSL)	
Deleware Riv			250,470.0	MLW	CTURER'S DESIGN	ATION OF DRILL		
3. DRILLING AGENCY		,020.0 L	200,470.0		Mounted Mot		L	
Warren Geor					O. OF OVERBURD		: DISTURBED : UNDISTURBE	D.
4. HOLE NO. (As sh		ng title and		SAMPLES				_
file number)			CB-274	14. TOTAL N	UMBER CORE BOX	XES		
5. NAME OF DRILLER				15. ELEVATIO	ON GROUND WATE	R		
John Klinger 6. DIRECTION OF HO							RTED : COMPLETED	
6. DIRECTION OF HO	, E	INCLINED	DEG. FROM VERT.	16. DATE HO	OLE	:		-1996
	<b>_</b> _	INCLINED	DEG. FROM YERI.	17. ELEVATIO	ON TOP OF HOLE		-43.2	
7. THICKNESS OF O			-	18. TOTAL C	ORE RECOVERY F	OR BORING		7.2 ft
8. DEPTH DRILLED II			12.0°	19. SIGNATUI	RE OF INSPECTOR	₹		
9. TOTAL DEPTH OF	HOLE		12.0 ft.				S. Krajnik	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS		CORE RECOV-	BOX OR Sample	REMARKS (Drilling time, water loss, depth	BLOW COUNT
			(Description)		ERY	NO.	weathering, etc., if significant)	PER 0.5'
-43.2	0.0	<u> </u>	Predominately GNEISS—Biotite—Quartz,		26%	f D_1	1 g 1 min/ft drillrate	h
70.2			soft, weathered with brown iron stains	:	26%	R-1	Timmy ir dimindie	
<b>I</b> ⊢	-	·///	friable due to large amount of biotite					1
-44	1-	/- '/	mica and minor amount of muscovite					
]	-	['_']//	mica, longest piece 3.0"					
<b>I</b> ∃	-	\ <i>///</i>						
-45	2_							
I ⊣		///						
1 7	_							
-46								
1 -	,  -  -	//- /						
1 1		$\langle \langle \rangle \rangle$						
-47		-1//						
1 ]	4-	1///						
	_	/_/-/						
-48	_	// ///						
]	5-	- "//	GNEISS, same to 50.8', badly fracture	d	84%	R-2	Coreloss between -48.2 and	
-	_	1 <i>11//</i>	, , , , , , , , , , , , , , , , , , , ,		""	"-	-50.8; 35 min for last 7.0'	
-49-	_							
-	6-		At -50.8 becomes massive					
1 7	_	[ <i>\`-\\\\</i> _	QUARTZ—Biotite, hard, dense, 45				l	
-50-			degree joints ❷ −52.5 to 52.8, 75 de	gree			Natural fractures	
<b>I</b> ~ ~ -	<del></del>	//- <u> </u>	joints <b>⊕</b> −54.5 to −55.2, lineation				noted in depth column	
1 1	<u> </u>	('-'/	generally vertical, longest piece 1.9'				numerous mechanical fracture	
	<b>~</b> -	<i>'\///</i>					also present and attributed to	
<b>-</b> 51-	8						drilling operations	
]	_	1/1	1					
I	-	にたり						
-52-								
-		'///\						
] ]	<b>/</b>	V-\/						
-53-	MB _ MB 10—	['_']//						
]	MB 10_	\ <i>///</i>						
]		<b>///</b>						
-54		1/1/2	1					
] ]	11 <del>-</del>							
]								
-55-	MB =	(/-)						
	12-		Bottom of Hole @ -55.2 below MLW					┪

								Hole No.	CB-275
DRILLI	NG LOG	DIVIS		INSTALLATION				SHEET	1
			lorth Atlantic Division		Atlantic – Pl	niladelphia		OF 1	SHEETS
1. PROJECT	01		0		D TYPE OF BIT		NXM Bit		
Delaware Riv	er Channe	i Deepening	g Study		FOR ELEVATION S	HOWN (TBM or	r MSL)		
2. LOCATION (Coord Deleware Riv			250,817.4	MLW	TURENÎO REGION	171011 AF DDH			
3. DRILLING AGENCY		,000.7	. 250,017.4		CTURER'S DESIGN Mounted Mol		L		
Warren Georg					O. OF OVERBURE		: DISTURBED	UNDISTURBED	
4. HOLE NO. (As sh		ng title and	:	SAMPLES	S TAKEN		DIOTORDED	·	
file number)			CB-275	14. TOTAL N	UMBER CORE BO	XES			
5. NAME OF DRILLER					ON GROUND WATE				
Mike McCarth				IJ. ELEVAIIC	N GROUND WAIL		RTED :	COMPLETED	
6. DIRECTION OF HO	)LE	•		16. DATE HO	)LE	: 3171	7-30-1996	7-30-1	1996
VERTICAL VERTICAL		INCLINED	DEG. FROM VERT.	17. FLEVATIO	ON TOP OF HOLE		-44.5		
7. THICKNESS OF O	VERBURDEN		-		ORE RECOVERY F		7110		7.5 ft
8. DEPTH DRILLED II	NTO ROCK		10.5'		RE OF INSPECTO				7.5 11
9. TOTAL DEPTH OF	HOLE		10.5 ft.	13. SIGNATOR	NE OF INSTITUTO	`	S. Krajnik		
			CLASSIFICATION OF MATERIALS		CORE	BOX OR	REMARKS		BLOW
ELEVATION	DEPTH	LEGEND	(Description)		RECOV-	SAMPLE	(Drilling time, water to		COUNT PER 0.5'
a	ь	С	ď		ERY e	NO. f	weathering, etc., if si g	gameum <i>)</i>	PER U.5
-44.5	0.0 _	- ///	Probably friable GNEISS, badly		71%	R−1	35min for 10.5		
-45	<u>-</u>	1///	weathered , washed away, drilled fairl	у					
]	_		rapidly						
<b>I</b> −	1-	1//					Coreloss zone -44.5	5' to -47.3'	
-46	-	-///-	GNEISS-Quartz-Biotite, fragmental from						
I "⊣	_	///、、	-47.4 to -47.8, hard, dense, lineation						
1 7	2	//-	from 45 degrees to 60 degrees between	en					
<b>I</b> 4,∃	_	/-//	-48.0 and -49.0 becomes vertical to				Incipient fractures 4	15° and 60°	
-47	-	L <i>Y///</i>	-55.0, slightly weathered fractures at				between -48.0' and	-49.0'	
1 1	, 3-		-47.8 and at -50.2						
1 7	/ -		1						
- <del>48</del>	MB -	トケン	1						
-									
1 1	<b>"</b> -	///							
-49	/	(/-!-/	}				Natural fractures		
1 1		// ///					noted in depth colu		
-	——MВ 5—	\///-	1				numerous mechanic		
-50-		/// \ \	1				also present and at	tributed to	
	<b>-</b> ]	1/1/2	}				drilling operations		
1 7	6_		]						
-51	-		1						
<b>I</b> "-	MB	<b>//-</b> `							
1 1	<del>-</del> 7-	K//\/	l l						
<b>I</b>	_	//							
-52	-	11//	1						
_	8-								
] -	_								
-53 <u>-</u>	_	[ <i>\</i> -///-							
-	-	///、、							
1 1	— '-	//- i -	At -53.2, brown iron stains for seve	ral					
-54	_	('-'//	inches on either side of fractures 45	iui					
1 1		L <i>\\\\\</i>	degree to 60 degree fractures are						
-	10-		incipient. Longest piece 2.4'						
-55 <del>-</del>	-	//-	4						ļ
			Bottom of Hole @ −55.0 Below MLW						
		Ī	1		I		I		I

							Hole No.	CB-276
DRILLI	NG LOG	DIVIS		INSTALLATION			SHEET	1
	110 200	N	lorth Atlantic Division		Atlantic – Pt	<u>niladelphia</u>	OF 1	SHEETS
1. PROJECT	01		CL 1		TYPE OF BIT		NXM Bit	
Delaware Riv 2. LOCATION (Coordi	er Channel	n peebeuing	g Study		OR ELEVATION S	HOWN (TBM or	· MSL)	
Deleware Riv			252 295 6	MLW	TURER'S DESIGNA	ATION OF DRILL		
3. DRILLING AGENCY		,204.0 L	202,230.0		Mounted Mob		L	
Warren Georg				13. TOTAL N	O. OF OVERBURD	FN	: DISTURBED : UNDISTURBED	
4. HOLE NO. (As sh	own on drawi	ng title and		SAMPLES				
file number)			CB-276	14. TOTAL N	UMBER CORE BOX	XES		
5. NAME OF DRILLER				15. FLEVATIO	N GROUND WATE	'R		
Mike McCarth 6. DIRECTION OF HO							RTED : COMPLETED	
6. DIRECTION OF HO		INCLINED	DEG ERON NERT	16. DATE HO	LE		7-29-1996 7-29-1	1996
		INCLINED	DEG. FROM VERT.	17. ELEVATIO	N TOP OF HOLE		-44.0	
7. THICKNESS OF O			0.7	18. TOTAL C	ORE RECOVERY F	OR BORING		8.2 ft
8. DEPTH DRILLED II	NTO ROCK		9.2'		RE OF INSPECTOR			
9. TOTAL DEPTH OF	HOLE		9.9 ft.				S. Krajnik	
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS		CORE RECOV-	BOX OR	REMARKS	BLOW COUNT
			(Description)		ERY	SAMPLE No.	(Drilling time, water loss, depth weathering, etc., if significant)	PER 0.5'
-44.0	ь 0.0	C T T T	CAND & CDAVE		e	f	l g i	h
	0.0		SAND & GRAVEL		74%	R−1	0.7 coreloss -44.0' to -44.7'	
]	_							
-45	1-	1.1//	Gray-Black GNEISS-Quartz-Biotite,					
I		<i>'///</i> ~	minor amounts of muscovite mica, ha					
<b>I</b>	_	(/-/-/	dense, most fractures are MBs due to					
-46		/i / ///	drilling, lineation predominately vertica but varies in places . vertical fracture					
<b>I</b> ~~~~	- *	\	from -45.1 to -45.3, irregular fractu					
1 ]	, -	/// \ \	degrees between -46.4 and -46.8,	163 00				
-47	/ ,-		longest piece 2.7'		100%	R-2	Natural fractures	
<b>│</b>	MB		Tongest piece 2.7		100%	"-2	noted in depth column	
1 1	_	////					numerous mechanical fractures	
		(/-)					also present and attributed to	
<del>-48</del>	4-	$\langle \cdot \rangle \langle \cdot \rangle$					drilling operations	
1 -	_	-://						
1 7	_	1///						
-49-	5_							
-	_							
1 3	₩ -	`- <i>///-</i>						
-50-	MB 6	///、、						
1 7	-							
l <u>j</u>								
-51-	,, 7—	`\///						
<b>I</b>	<u>MD</u> _							
<b>I</b> −	-							
-52	MB 8	にん						
<b>I</b> <sup></sup> -{	MB -	, <i>\</i>						
<b>I</b>	MB_ =							
-53	<u> </u>	V-17						
_~		' <i>\'\\\</i>						
]		\ <i>///</i>						
<b>I</b> →	MB	(//_ \ \	D-H					
			Bottom of Hole @ −53.9 below MLW					

								Hole No.	CB-277
DRILLII	NG LOG	DIVIS		INSTALLATION		. !!! L !		SHEET	1
1. PROJECT		<u> </u>	orth Atlantic Division	1	<u> Atlantic – Pl</u>		NVM Du	OF 1	SHEETS
Delaware Riv	er Channel	l Deepening	ı Studv		D TYPE OF BIT FOR ELEVATION S		NXM Bit		
2. LOCATION (Coordi	inates or Stati	on)		MLW	OR ELEVATION O		moL)		
Deleware Rive 3. DRILLING AGENCY		,909.1 E	252,249.2		CTURER'S DESIGN		•		
3. DRILLING AGENCY Warren Georg					Mounted Mot 0. OF OVERBURD		: DISTURBED :	UNDISTURBED	
4. HOLE NO. (As sh		ng title and	:	SAMPLES		LIN	DISTORDED	ONDISTORDED	
file number)			: CB-277	14. TOTAL N	UMBER CORE BO	XES			
5. NAME OF DRILLER Mike McCarth				15. ELEVATIO	ON GROUND WATE	:R			
6. DIRECTION OF HO				16. DATE HO	N E	STAR		IPLETED	
VERTICAL		INCLINED	DEG. FROM VERT.			<u> </u>	7-29-1996	7-29-1	1996
7. THICKNESS OF O	VERBURDEN		8.2'		ON TOP OF HOLE		-45.2		
8. DEPTH DRILLED IN	NTO ROCK		1.6'		ore recovery f re of inspectoi				1.8 ft
9. TOTAL DEPTH OF	HOLE		10.0 ft.	19. SIGNATU	KE OF INSPECTOR	(	S. Krajnik		
		LEGEND	CLASSIFICATION OF MATERIALS		CORE	BOX OR	REMARKS		BLOW
ELEVATION	DEPTH	LEGEND	(Description)		RECOV- ERY	SAMPLE NO.	(Drilling time, water loss, weathering, etc., if signif		COUNT PER 0.5'
-45.2 _	ь 0.0	C 744	d		e 400/	f	g		h
-43.2	0.0 _		SAND & GRAVEL, rapid drilling, Quartz gravel at top of run	4	18%		Coreloss from -45.2 t	o -53.4	
-46-	-		graver at top or rain				5 min for 1st 5' run 23 min for 2nd 5' rui	n	
L " -	1-						Irregular drilling for 7		
7	=						-52.2 indicated sand	& gravel	
-47-	_						then friable gneiss to	-53.6	
]	2								
]	_								
-48									
]	<b>J</b>								
	_								
-49	4								
	_								
<b>-</b> 50 <u>-</u>	5-								
	-								
- -51	_								
]	6_								
7	_								
-52 <del></del>	_								
	7-								
	_								
-53-									
=	-		Metasedimentary		-				
I	=	1 <i>1//</i>	GNEISS-Quartz-Biotite with traces of				Natural fractures		
-54	<u> </u>		muscovite, lineation trace 60 degree				noted in depth column		
]	<b>-</b>		dip, badly weathered with fragmental				numerous mechanical also present and attri		
-55 -55	<b>-</b>	\` <i>-///-</i>	recovery from -54.7 to -54.9, longer	st \			drilling operations	Juleu 10	
-33	10-	<i>///</i> . 、	piece 0.4', fragmental at bottom (MB Bottom of Hole © −55.2 below MLW		-		ag operanone		
			Dollott of Hole & -33.2 below MLW						
					I		I		1

								Hole No.	CB-278
DRILLI	NG LOG	DIVIS		INSTALLATION				SHEET	1
			lorth Atlantic Division		<u>itlantic – Pt</u>	niladelphia		OF 1	SHEETS
1. PROJECT	Ch	l Daananina	- Cl., d.		TYPE OF BIT		NXM Bit		
Delaware Riv 2. LOCATION (Coord	/er unanne	ı Deebeulud	g Study		OR ELEVATION S	HOWN (TBM or	· MSL)		
Deleware Riv			253,294.9	MLW 12 MANUEAC	TURER'S DESIGNA	ATION OF DOIL	1		
3. DRILLING AGENCY		,020.1 E	. 200,204.0		Mounted Mob		<b>L</b>		
Warren Geor	ge Inc				D. OF OVERBURD		: DISTURBED	UNDISTURBED	
4. HOLE NO. (As st		ng title and	:	SAMPLES	TAKEN				
file number)			CB-278	14. TOTAL N	UMBER CORE BOX	ŒS			
5. NAME OF DRILLE				15 FLEVATIO	N GROUND WATE	R			
Mike McCarti  6. DIRECTION OF HO						 : Stai	RTED : C	COMPLETED	
	,	l		16. DATE HO	LE		8-1-1996	8-1-1	996
▼ VERTICAL		INCLINED	DEG. FROM VERT.	17. ELEVATIO	N TOP OF HOLE		-43.7		
7. THICKNESS OF O	VERBURDEN		0.2'		ORE RECOVERY F	OR BORING			9.8 ft
8. DEPTH DRILLED I	NTO ROCK		9.8'		RE OF INSPECTOR				J.U "
9. TOTAL DEPTH OF	HOLE		10.0 ft.				S. Krajnik		
EI EI I EI			CLASSIFICATION OF MATERIALS		CORE	BOX OR	REMARKS		BLOW
ELEVATION	DEPTH	LEGEND	(Description)		RECOV- ERY	SAMPLE No.	(Drilling time, water low weathering, etc., if sign		COUNT PER 0.5'
a	ь	С	d		e	f	` g	,,	h 0.0
-43.7 - -44	0.0 _ MBs _	::::: <del>:</del>	Quartzitic SANDSTONE*, minor		92%	R-1	14min for 3.4'		
]		[:::::::	amounts of Hornblende grains and				1		
]			Biotite and muscovite mica, hard,						
-45-	├ <b>─</b> _MB	[:::::::	dense, moderately fractured with staining in fractures, most fractures				1		
<b> </b>	_		essentially horizontal, faint trace of						
_	<u> </u>		mineral, lineation almost vertical,						
	<b>├</b> 2-	:::::::	longest piece 0.6'						
<del>-46</del>	<u> </u>		l loligesi piece 0.0						
-	_ [								
_	3								
-47	<b>-</b> -	· · · · · · · · · · · · · · · · · · ·	OI-92. CANDCTONEY				 		
_	_		Quartzitic SANDSTONE*, same as		100%	R-2	*Sandstone appearar	ice of	
]	<b>-</b> +		above to -49.8, moderately fractured				metamorphic rock		
-48	_ :		with light staining, essentially horizont						
_	-		fractures, an increase in muscovite m	ica					
_	5								
-49	<u> </u>		At -49.8 is somewhat contorted and						
I "-		:::::::	with an increase in Biotite and				Natural fractures		
1 7	L_		muscovite, some red hematite noted,				noted in depth colur	nn	
	Μ -	:::::::	lineation of minerals is varies and				numerous mechanica		
<b>-</b> 50	( -		vertical, hard, dense, fractures rather				also present and att		
-	<b>                                     </b>		easily from -49.8 to -51.8 and -53.	0 to			drilling operations	Tibulou 10	
_	<b>⊅</b>   7-		-53.7 where mica minerals are	0 10			arming operations		
-51	( =		abundant, longest piece 1.1'						
_	) -	:::::::	abundani, longosi piece 1.1						
_	<b>├</b>								
-52	<b> </b>								
_	<u> </u>	:::::::							
-									
-53		:::::::							
] 33									
_									
	10-		Bottom of Hole @ -53.7 below MLW						1
							1		
							1		
							1		
							1		
		I				Ī	1		I

								Hole No.	CB-279
DRILLI	NG LOG	DIVIS		INSTALLATION				SHEET	1
1. PROJECT		<u> </u>	lorth Atlantic Division		<u> Atlantic – Pl</u>	niladelphia	NVM P*	OF 1	SHEETS
Delaware Riv	er Channe	l Deepening	n Study		D TYPE OF BIT FOR ELEVATION S	HOWN (TRM or	NXM Bit		
2. LOCATION (Coord	linates or Stati	ion)	•	MLW	OK LELYATION 3	TOWN (IDM O	mot/		
Deleware Riv		,491.0 E	253,424.0		CTURER'S DESIGN		L		
3. DRILLING AGENCY Warren Geor					Mounted Mot		. DIOTE ID SED		
4. HOLE NO. (As si		na title and	:		IO. OF OVERBURD S TAKEN	EN	DISTURBED	UNDISTURBED	
file number)			CB-279	14. TOTAL N	IUMBER CORE BO	XFS	· ·		
5. NAME OF DRILLE					ON GROUND WATE				
Mike McCart  6. DIRECTION OF HO							RTED : CON	MPLETED	
VERTICAL		INCLINED	DEG. FROM VERT.	16. DATE HO	)IF		8-1-1996	8-1-1	996
7. THICKNESS OF O	WEDDIJDDEN	,	3.0'	17. ELEVATIO	ON TOP OF HOLE		<b>-43.7</b>		
8. DEPTH DRILLED I					ORE RECOVERY F				11.3 ft
9. TOTAL DEPTH OF				19. SIGNATUI	re of inspector	₹	C V:-:I.		
9. IOIAL DEFIN OF	HOLE	ſ	CLASSIFICATION OF MATERIALS		CORE	BOX OR	S. Krajnik REMARKS		BLOW
ELEVATION a	DEPTH b	LEGEND C	(Description)		RECOV- ERY e	SAMPLE NO. f	(Drilling time, water loss, weathering, etc., if signit g	depth ficant)	COUNT PER 0.5' h
-43. <u>7</u> 44	0.0 -		SAND & GRAVEL, piece of gray green		0.066%	R−1	1min/ft drillrate		
=	] _=	$\mathcal{H}$	Quartzite jammed in bit						
-45 <del>-</del>	'3						Coreloss zone -43.7'	to -46.4'	
] =	_ =								
-46	-								
] =	,=								
-47	<b>_</b> 7	- 1//	Metasedimentary Quartzitic GNEISS		100%	R-2	12 min for 3.7°		
3	WBs, =	1///	with black Hornblende, salt and peppe	er					
-48 <del>-</del>	<b>S</b> J 📆	( <u>-</u> !-)	appearance, muscovite mica present throughout as minor mineral locally						
=		11///	more prevalent, light gray, hard, dens	e.					
-49 <del>-</del>	_ "	////	partly weathered joints at -48.2 and	,					
=			-49.0 to -49.6, lineation or bedding						
-50 <del>-</del>		//-//	trace not apparent, rock is badly						
3	<b> </b>	\///	fractured due to drilling most breaks		100%	R-3	Blew packing on swive	اد	
-51 <del>-</del>			MBs, many like poker chips, weathere		100%	"-3	during last run. Overd	rilled to	
=	<b>  </b>		vertical fracture irregular from -48.8 49.6, fresh vertical irregular fractures				-57.8; 20min for 7.4'		
-52			from -50.0 to -50.4, longest piece 0						
3	<b>_</b> .=	/ <i>リ//</i>	The state of the s						
-53	<b>9</b> 9								
]							Natural fractures		
-54	10-   MBs	\' <i>-\\\</i> -					noted in depth column	n	
~~=		///、、					numerous mechanical		
-55		11:10	1				also present and attri	buted to	
] " =			1				drilling operations		
	E   12-		1						
<b> </b>	13-	<b>/</b> // \ /	4						
-57		-1//							
_	14-	<u>ועו</u>	Dellare of Hala & 579 balan MIW						
			Bottom of Hole @ -57.8 below MLW						
	I	I	l		I				

						H	<u>ole No.</u>	CB-280
DRILLING LO	OG DIVIS		INSTALLATION				SHEET	1
1. PROJECT	N	lorth Atlantic Division		tlantic – Ph			OF 1	SHEETS
Delaware River Ch	nnnel Naananin	n Study		TYPE OF BIT		NXM Bit		
2. LOCATION (Coordinates of	r Station)	g olway	11. DATUM F MLW	OR ELEVATION S	HOMMI (IBM OF	mor)		
Deleware River N	369,694.0 E	253,334.0		TURER'S DESIGNA	ATION OF DRIL	L		
3. DRILLING AGENCY			Barge I	Mounted Mob	ile B-61			
Warren George Inc 4. HOLE NO. (As shown on	drawing MIs J		13. TOTAL N SAMPLES	D. OF OVERBURD	EN	DISTURBED U	NDISTURBED	
4. HOLE NO. (AS shown on file number)	urawing mie ana	CB-280			·F0	<u>: : : : : : : : : : : : : : : : : : : </u>		
5. NAME OF DRILLER		. 05 200		UMBER CORE BOX				
Mike McCarthy			15. ELEVATIO	N GROUND WATE		OTEN COMPA	FTEN	
6. DIRECTION OF HOLE	_		16. DATE HO	LE	STAI	RTED COMPL 8-2-1996	ETED 8-2-1	996
VERTICAL VERTICAL	☐ INCLINED	DEG. FROM VERT.	17. ELEVATIO	N TOP OF HOLE	-	<del>-44.</del> 7	V & 1	
7. THICKNESS OF OVERBURD	EN	-		ORE RECOVERY F	OR BORING			ft
8. DEPTH DRILLED INTO ROC	K	10.3*		RE OF INSPECTOR				
9. TOTAL DEPTH OF HOLE		10.3 ft.				S. Krajnik		
ELEVATION DEP	TH LEGEND	CLASSIFICATION OF MATERIALS	-	CORE RECOV-	BOX OR Sample	REMARKS	anth .	BLOW Count
		(Description)		ERY	NO.	(Drilling time, water loss, de weathering, etc., if significa	int)	PER 0.5'
a b		Light gray metasedimentary		e 00.5%	f D.4	5min for 1st 5' run, 14	min	h
-45-		GNEISS-Quartz-Hornblende with		80.5%	R−1	for remainder; 2' corelo		
	<b>-</b> 1///	muscovite mica, few pieces of Quartz				to washing away -44.7'		
1 1	H/-1/	gravel at top, salt & pepper appearar				-46.7'		
-46	11////	relatively soft and friable at top,	•					
	1///	saprolitic, rock became harder with				Matural fractures		
I 1	2-1//-   -	depth <b>©</b> −47.5, rock is badly fracture				Natural fractures noted in depth column		
-47	1/-//	predominantly due to drilling, all brea	ks are			numerous mechanical fr	actures	
l 1-	<u> </u>	MBs. Longest piece 1.1'				also present and attribu		
	3					drilling operations		
-48								
<b> </b>								
l 1_	<b>┩</b> ///	1						
-49	1///							
	5-] \-///-							
-50	1///、、							
1 1								
	6-1/-//							
-51-	<i>\$\\\\\</i>	1						
<b>l</b> }−								
上	7///	1						
-52	11/	1						
→	1///	1						
] ]	87///							
-53	1/7///	1						
ı ‡≥	<u> </u>	1						
] ]	97///\	1						
-54	北コン	1						
	1//							
/ t	10-1///	1						
-55	1//	Bottom of Hole @ −55.0 below MLW						
		DOTTOTT OF TIOLE & -33.0 DETOW MLW						
		1				1		

									. CB-28
DRILLI	NG LOG	DIVIS		INSTALLATION		niladala bis		SHEET	1
1. PROJECT		l N	lorth Atlantic Division		tlantic – Ph TYPE OF BIT		NXM Bit	OF 1	SHEETS
Delaware Riv	er Channe	l Deepening	ı Study		OR ELEVATION S				
2. LOCATION (Coord	inates or Stati	ion)		MLW	ON LEETAIIUN 3	(10 88 01	mosj		
Deleware Riv	er N 369		253,850.6	12. MANUFAC	TURER'S DESIGNA		L		
3. DRILLING AGENCY					Mounted Mob				
Warren George 4. HOLE NO. (As sh	ye INC Jown on drawi	ng title and	:	13. TOTAL NO SAMPLES	D. OF OVERBURD TAKEN	EN	DISTURBED	UNDISTURBED	
file number)	WI VII VII VII VII VII VII VII VII VII	giv wild	CB-281		UMBER CORE BOX	YFS	<u>:</u>		
5. NAME OF DRILLER					N GROUND WATE				
Mike McCarth						.r : staf	STED . CUMB	PLETED	
6. DIRECTION OF HO	<u></u>	l morne		16. DATE HO	LE .	SIM	8-2-1996	8-2-1	996
VERTICAL INCLINED DEG. FROM VERT.					N TOP OF HOLE		-44.2		
7. THICKNESS OF OVERBURDEN 0.4					ORE RECOVERY F	OR BORING			0.4 ft
8. DEPTH DRILLED II			10.4	19. SIGNATUR	RE OF INSPECTOR	1			
9. TOTAL DEPTH OF	HOLE	_	10.8 ft.		CODE	DOV OD	S. Krajnik REMARKS		DI OW
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)		CORE RECOV-	BOX OR Sample	(Drilling time, water loss, a		BLOW COUNT
a	ь	c	d		ERY e	NO. f	weathering, etc., if signific g	cant)	PER 0.5' h
-44.2	0.0 _	- 1//	Metasedimentary Quartzitic GNEISS		3.7%	R-1	1min/ft drillrate for fir	st 10'	
]	_	1///	0.4' recovery consisting of three piece				3min for last 0.8'	. ••	
-45		<u>//-</u> /-)	Quartzite gravel, gravel jammed in bit	and					
	<del> </del> -	Y ///	acted as a reamer and reamed out o				Coreloss zone -44.6' to	_55 A'	
]	_	\ <i>&gt;///-</i>	soft, micaceous Quartz rock, probably saprolitic near top of the hole				1001 61033 ZUIIG -44.0 I		
-46	_	/// \ \	Suprofilic fledi top of file flore						
] ]		1/1/2							
1 1	_	15//							
-47									
] -	-	(/:)							
] [	-	$\left( \begin{array}{c} 1 \\ 1 \end{array} \right)$							
-48		1.1//							
]		<b> </b> ///							
] ]	_	V=\:/							
-49	- 5	[1]							
]									
]	-	<b>//-                                   </b>							
-50 -	6-	('-//							
-		1///							
]	] =								
_51 <u></u>	7								
	<u>-</u>	ドーノ							
<u> </u>	_	1///							
<b>-</b> 52	8-	<b>///</b> /_							
]	-	1/1//							
	_	\` <i>-///-</i>							
-53	9_	<b>///</b> /、、							
	_	火/ ラ							
	-								
-5 <del>4</del>	10-								
	_	(//-)							
- -55	_	<u> </u>							1
-55	_		Bottom of Hole @ -55.0 below MLW						]
	i		•						

								Hole No.	CB-282	
DRILLI	NG LOG	DIVIS		INSTALLATION				SHEET	1	
1. PROJECT		N	orth Atlantic Division	North Atlantic – Philadelphia of 1 Sheets  10. Size and type of bit NXM Bit						
Delaware Riv	er Channe	l Deepening	study	10. SIZE AND TYPE OF BIT NXM BIT  11. DATUM FOR ELEVATION SHOWN (TBM or MSL)						
2. LOCATION (Coord	linates or Stati	ion)	, 0.00	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW						
Deleware Riv		,843.3 E	255,527.6	12. MANUFACTURER'S DESIGNATION OF DRILL						
3. DRILLING AGENCY Warren Geor				Barge Mounted Mobile B-61						
4. HOLE NO. (As st		na title and	:		O. OF OVERBURD STAKEN	EN	DISTURBED	UNDISTURBED		
file number)			CB-282	14. TOTAL N	UMBER CORE BO	XFS	•	•		
5. NAME OF DRILLE					ON GROUND WATE					
Mike McCarti  6. DIRECTION OF HO							RTED : CO	MPLETED		
U. DIRECTION OF IN		INCLINED	DEG. FROM VERT.	16. DATE HO	OLE	<u> </u>	8-2-1996	8-2-1	996	
7. THICKNESS OF OVERBURDEN –					ON TOP OF HOLE		-44.1			
					ORE RECOVERY F				7.7 fl	
9. TOTAL DEPTH OF	8. DEPTH DRILLED INTO ROCK 9.3'					₹	C Kaminila			
9. IOIAL DEPIH OF	HOLE		9.3 ft. classification of materials		CORE	BOX OR	S. Krajnik  REMARKS		BLOW	
ELEVATION a	DEPTH b	LEGEND C	CLASSIFICATION OF MATERIALS (Description) d		RECOV- ERY e	SAMPLE NO. f	(Drilling time, water loss weathering, etc., if sign	i, depth ificant)	COUNT PER 0.5' h	
-44.1 -	0.0 _		SAND & GRAVEL, possibly friable rock,	ı	79.4%	R−1	1.6' coreloss @ top o	of run		
=	_		washed away due to drilling				from -44.1 to -45.7;	; 2min/ft		
-45 <del></del>							drill rate; Pump stalli	ng		
_	-									
=	<u> </u>		GNEISS-Quartz-Biotite with minor							
-46	<u>  </u>		amounts of muscovite mica , hard,							
_		///	dense, badly fractured in places due	to						
_	MBs -	(- '/	drilling, limeation of minerals at 45							
-47	<b> -</b>   3_	['-]//	degrees, some standard fractures are							
_	L_  -		essentially horizontal with many MBs,							
_	<b>一</b> 」-	(/-   `- <u> </u>	few fracture are 30 degrees to 45							
-48 <u>-</u>	4-		degrees, slightly weathered in joints @							
=	_ =		-46.5, -48.3, -48.8, 49.4 to -49.5, -50.7, -53.1 (Largest rock fragment							
	MB -		Largest fock fragment	0.0 )			Natural fractures			
-49	<b>E</b> MR 5-						noted in depth colum			
=	<b>F</b> " :	'-/					numerous mechanical			
_	<b>-</b>	11//					also present and attr	ibuted to		
-50-	—мв <sub>6</sub> —						drilling operations			
=	<b>₩</b> B =									
	<u> </u>	\ <i>-///-</i>								
-51-	<b>─</b> MB 7-	///、、								
=		1/1/								
-52 <del></del>	8-				100%	R-2	Pump Stalling			
_	—	(/-)					13 min for last 1.5'			
_	—мв =	<b>/</b> /</td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
-53	<b>—</b> 9	- ///								
_	—	1 1///	Bottom of Hole @ -53.4 below MLW							
			Bottom of Hote & Co.+ Botow MEM							
							1			
							1			

								<u>Hole No.</u>	CB-283
DRILLI	NG LOG	DIVIS		INSTALLATION				SHEET	1
	110 200	N	orth Atlantic Division		Atlantic – Pl			OF 1	SHEETS
1. PROJECT Delaware Riv	er Channel	l Despenies	Study		D TYPE OF BIT		NXM Bit		
2. LOCATION (Coord	inates or Stati	ou) neeberning	Sludy	I 11. DATUM F MLW	OR ELEVATION S	HOWN (IBM or	· MSL)		
Deleware Riv	er N 370	,753.0 E	257,907.4		TURER'S DESIGN	ATION OF DRIL	<u> </u>		
3. DRILLING AGENCY					Mounted Mot				
Warren George Inc 4. HOLE NO. (As shown on drawing title and					O. OF OVERBURD S TAKEN	EN	DISTURBED	UNDISTURBED	
4. HOLE NO. (As she	nown on drawi	ng title and	CB-283				<u>:</u>		
5. NAME OF DRILLER	R		: СБ-265	14. TOTAL N	UMBER CORE BOX	XES			
John Klinger				15. ELEVATIO	N GROUND WATE				
6. DIRECTION OF HO	DLE			16. DATE HO	LE	STAI	· ·	APLETED O 7 1	006
▼ VERTICAL		INCLINED	DEG. FROM VERT.	17 FI FVATIO	N TOP OF HOLE	:	8-3-1996 : -44.4	8-3-1	330
7. THICKNESS OF O	VERBURDEN		1.6'				-44.4		11 1 4
8. DEPTH DRILLED II	NTO ROCK		9.8'		ore recovery f re of inspector				11.1 #
9. TOTAL DEPTH OF	HOLE		11.4 ft.	19. SIGNATUI	KE OF INSPECTOR	,	S. Krajnik		
			CLASSIFICATION OF MATERIALS		CORE	BOX OR	REMARKS		BLOW
ELEVATION	DEPTH	LEGEND	(Description)		RECOV- ERY	SAMPLE NO.	(Drilling time, water loss, weathering, etc., if signit		COUNT PER 0.5'
<b>a</b>	Ь	С	d d		8	f	I 9		h
-44.4	0.0 _	<i>\\\\\\\</i>	CLAY, 1.6' thick, dark gray		100%	R−1	20 min for first 5.8'		
-45	] -								
]									
]	'-						1		
-46	_		0.15100		ļ				
I "-		-1//	GNEISS, gray black medley of						
1 7		////	Hornblende, Quartz, Biotite, very hard,						
-47	_	(/-'/-	dense, moderately fractured ranging	.41					
<b>I</b> <sup>-</sup> "′-∣	MB	// ///	between 0.2' and 0.8' long, very slight weathered in joints, lineation ©	шу					
1 1	- 3-	\///-	approximately 60 degrees with most						
<b>l</b> "⊣	MB -	/// \ \	natural fractures parallel to lineation,						
-48-	_	1/1/	longest piece 0.8', 0.3' left in hole						
_	<b>-</b> +		longest piece o.o., o.o terr in noic						
=	MB								
<del>-49</del>	MB -								
1 -	MB 5-	$\langle \cdot \rangle \langle \cdot \rangle$							
]		-:-//							
-50-		1///							
4	MBs 6								
	_				94.6%	R-2	36 min for last 5.6'		
-51		` <i>-///-</i>				" -			
] ]	7-	<i>///</i> <>					1		
] =	_ :	1/1/					1		
-52	<b> </b>						1		
]	ир 8						Natural fractures		
]	MB °						noted in depth columi		
-53	MB -						numerous mechanical		
"⊣	MB -	にん					also present and attri	buted to	
]	<b>—</b>	<i>                                   </i>					drilling operations		
-54	MB -						1		
	MB 10	(-i/					1		
]	₩ <u>B</u> 10	' <i>\'\\\</i>					1		
<b> </b>	MB_	V///. [					1		
-55-	_	V/-							
] 3	_MB11—	(/-//					1		
]	-	1 1/2	Bottom of Hole <b>©</b> −55.8 below MLW						
			DOLLOTT OF HOLE & -33.0 DEIOM MLW				1		
							1		
							1		
							1		
							1		
							1		
	Ī				I		I		1

								<u>Hole No.</u>	CB-284		
DRILLI	NG LOG	DIVIS		INSTALLATION				SHEET	1		
1. PROJECT	100	Į N	lorth Atlantic Division	North Atlantic - Philadelphia OF 1 SHEETS							
1. PROJECT Delaware Riv	er Channa	l Despenies	s Study	10. SIZE AND TYPE OF BIT NXM Bit							
2. LOCATION (Coordi	ingles or Stati	ou) neahamuí	y Jiuuy	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW							
Deleware Riv	er N 371		259,167.4	MLW  12. MANUFACTURER'S DESIGNATION OF DRILL							
3. DRILLING AGENCY		•	,	Barge Mounted Mobile B-61							
Warren Georg	ge Inc			13. TOTAL N	O. OF OVERBURD		DISTURBED	UNDISTURBED			
4. HOLE NO. (As she file number)	nown on drawi	ng title and	CB-284	SAMPLES TAKEN							
5. NAME OF DRILLER	R		: CB-204		UMBER CORE BOX						
John Klinger	•			15. ELEVATIO	N GROUND WATE						
6. DIRECTION OF HO	OLE			16. DATE HO	LE	STAR		PLETED O Z 1	006		
VERTICAL		INCLINED	DEG. FROM VERT.	47 FLEWING	N TOP OF HOLE		8-3-1996 -45.0	8-3-1	990		
7. THICKNESS OF O	VERBURDEN		-		ORE RECOVERY F		-45.0		0.4 ft		
8. DEPTH DRILLED INTO ROCK 10.0°					RE OF INSPECTOR				U.4 II		
9. TOTAL DEPTH OF	HOLE		10.0 ft.	10. 310111101	NE OF MOFEOTOR	•	S. Krajnik				
51 514 51A11			CLASSIFICATION OF MATERIALS		CORE RECOV-	BOX OR Sample	I REMARKS		BLOW		
ELEVATION	DEPTH	LEGEND	(Description)		ERY	NO.	(Drilling time, water loss, weathering, etc., if signifi	depth icant)	COUNT PER 0.5'		
-45.0	ь 0.0	c	CNEISS Ougsts Hamblands madium		8	f	<b>l</b> 9	·	h		
45.0	0.0 _	11//	GNEISS, Quartz—Hornblende, medium gray, soft, slightly weathered, fine		4%		2 min for first 4.8' 10 min for last 5.2'				
<b>I</b> ┤	-	\ <u>\</u>	grained				TO HILL TO TUST J.Z				
-46	1-	V=1/	3								
1 1	_										
1 -	_						Coreloss zone -45.0' 1	. E46'			
-47	2-						Coreloss zone -45.0 1	0 -34.6			
1 1	_	('-'//									
l ±	_	L <i>Y///</i>									
-48	3-						Drilling very rapid indic	catina			
1 1	_						soft/weak rock materic	al a			
-	-						(very low recovery)				
-49	4-	, <i>\</i> //									
1 1	_										
-	-										
-50-	5	['-]//-									
1 1	_	///、、									
<b>I</b> −	-	//- i -									
-51-	6	-//									
1 1	_	<i>\\\\\</i>									
<b>I</b> −	-										
-52-	7										
<b>I</b>	· -	ドーノ									
<b>l</b> -	-	<i> リ//</i>	1								
-53	8-	///:									
<b> </b> "		17/									
<b>I</b>	-	['-///-									
-54-		<b>///</b> 、、									
<b> </b>		1/1/									
]	] -										
-55	10-	<u> </u>									
"	',		Bottom of Hole <b>©</b> −55.0 Below MLW								
<b> </b>											
<b> </b>											

								<u>Hole No.</u>	CB-285
DRILLI	NG LOG	DIVIS		INSTALLATION				SHEET	1
1. PROJECT		l N	orth Atlantic Division	North Atlantic - Philadelphia OF 1 SHEETS  10. SIZE AND TYPE OF BIT NXM Bit					
Delaware Riv	er Channe	l Deepening	ı Studv		OR ELEVATION S	HOWN (TRM or			
2. LOCATION (Coordi	inates or Stati	ion)		MLW		(			
	Deleware River N 370,927.4 E 259,698.2 3. DRILLING AGENCY					ATION OF DRIL			
S. DMILLING AGENCY Warren George Inc					Mounted Mot O. OF OVERBURD		: DISTURBED :	UNDISTURBED	
4. HOLE NO. (As shown on drawing title and					S TAKEN	L.,	DISTORDED	ONDIO I ONDED	
file number)			CB-285	14. TOTAL N	UMBER CORE BOX	KES			
5. NAME OF DRILLER Mike McCarth				15. ELEVATIO	N GROUND WATE	R			
6. DIRECTION OF HO				16. DATE HO	LE	STA		PLETED	000
VERTICAL INCLINED DEG. FROM VERT.					N TOP OF HOLE	<u> </u>	8-5-1996	8-5-1	996
7. THICKNESS OF OVERBURDEN 5.1'					ORE RECOVERY F		-45.9		6.0 ft
8. DEPTH DRILLED IN	NTO ROCK		6.1°		RE OF INSPECTOR				0.0 11
9. TOTAL DEPTH OF	HOLE		11.2 ft.				S. Krajnik		
ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS		CORE RECOV-	BOX OR Sample	REMARKS (Drilling time, water loss,	depth	BLOW COUNT
a	ь	c	(Description)		ERY	NO.	weathering, etc., if signifi	cant)	PER 0.5'
-45. <del>9</del> 46	0.0 _		SAND & GRAVEL, possibly weathered		53.5%	R-1	1min/ft drill rate for	1st 3.0'	"
] ]	-		Gneiss			" '	18 min for next 2.0'	-	
]	]						40 min for last 6.2'		
-47	<del> </del>						Coreloss from -45.9 to	o -51.0	
I -	_								
I ]	2_	5 000							
- <del>48</del>									
1 1	_								
-49	3-								
<b>I</b> ~~~⊣	_								
1 7	_								
-50	4								
1 1	-								
1 =									
-51	5 MB		GNEISS, Quartz-Hornblende, scattered						
<b>I</b>	MB	/ <i>リ//</i>	Pyrite, very hard, dense, coarse						
<b>l</b> ‡			grained, most fractures are essentially						
-52-	MB -		horizontal, fractured pieces range from	m			l.,		
l d		\ -///-	0.1' to 1.2' long				Natural fractures		
[	7	///\\					noted in depth column numerous mechanical		
-53 -	<u>MB</u> ' _	11/2					also present and attrib		
1 4	_	15/					drilling operations		
-54	. 8								
<u> </u>		1/1					1		
]		`'-/					1		
-55	9-	11//					1		
]	_						1		
]	<b>&gt;</b>	( - M							
<b>-</b> 56	MB 10-	\ <i>-///-</i>					1		
]	MB -	///\\					1		
<b> </b>	MB_ 11—	1/1/2					1		
-57	·" -	-//	Bottom of Hole @ 57.1 below MLW						
							1		
							1		
							1		
							1		
							1		

					Hole No	<u>. CB−286</u>	
	SION	INSTALLATION			SHEET	1	
	North Atlantic Division	North Atlantic - Philadelphia OF 1 SHEETS					
1. PROJECT	CL I	10. SIZE AND TYPE OF BIT NXM Bit					
Delaware River Channel Deepenin 2. LOCATION (Coordinates or Station)	g Study	11. DATUM FOR ELEVATION SHOWN (TBM or MSL)					
Deleware River N 371,302.5	F 259 967 N	MLW					
3. DRILLING AGENCY	233,307.0	12. MANUFACTURER'S DESIGNATION OF DRILL Barge Mounted Mobile B-61					
Warren George Inc			O. OF OVERBURD		: DISTURBED : UNDISTURBEI	)	
4. HOLE NO. (As shown on drawing title and		SAMPLES					
file number)	CB-286	14. TOTAL N	UMBER CORE BOX	XES			
5. NAME OF DRILLER		15. FLEVATIO	N GROUND WATE	'R			
Mike McCarthy 6. DIRECTION OF HOLE					RTED : COMPLETED		
VERTICAL INCLINED	DEG. FROM VERT.	16. DATE HO	LE	:	8-5-1996 8-5-	1996	
		17. ELEVATIO	N TOP OF HOLE		-44.4		
7. THICKNESS OF OVERBURDEN	1.63	18. TOTAL CO	ORE RECOVERY F	OR BORING		8.4 ft	
8. DEPTH DRILLED INTO ROCK	8.6'		RE OF INSPECTOR				
9. TOTAL DEPTH OF HOLE	10.2 ft.				S. Krajnik		
ELEVATION DEPTH LEGEND	CLASSIFICATION OF MATERIALS		CORE RECOV-	BOX OR Sample	REMARKS (Drilling time, water loss, depth	BLOW COUNT	
	(Description)		ERY	NO.	weathering, etc., if significant)	PER 0.5'	
a b c -44.4 0.0 • • • •	CAND & CDAVEL		e	f	l g	h	
-44.4 J U.U J J	SAND & GRAVEL, possibly weathered		82.3%		2min/ft for 1st 2.0' 12 min for 2nd 2.0'		
-45-	Gneiss				162 min for last 6.2'		
					1.6' coreloss from -44.4 to		
	:				1.6 coreloss from -44.4 fo  -46.0		
-46	1				·····		
	GNEISS, coarse grained Quartz-Biotite,						
-47	minor amounts of Plagioclase, and						
<b>I</b> +   1////	scattered fine Pyrite, very hard, dense						
MBs 3-1	most fractures are essentially horizont						
<b>l</b>	and due to drilling, rock becomes fin	е					
-48   1	grained from -52.6 to -54.6, most						
<b>│</b>	fractures range from 0.1' to 0.4', 0.2	2' left					
	in hole						
<b>I</b> -49							
	1						
_50 MBs ]\/ \/	1						
_5,	1				l		
-51					Natural fractures		
<b>Ⅰ ♪</b> ⅓ ///-	1				noted in depth column		
I I ///\\					numerous mechanical fractures		
-52	,				also present and attributed to		
	1				drilling operations		
<b>」</b> <i>↑  ↓〉///</i>	1						
-53							
<b>1 1/</b> • <b>1/</b> • <b>1/</b> • <b>1/</b> • • • • • • • • • • • • • • • • • • •	1						
<b>」   f゛</b> なたノ							
-54 = 1/1//	1						
	`						
	Dellam of Hala & E46 halam WW					4	
<b> </b>	Bottom of Hole <b>©</b> −54.6 below MLW						
]							
<b>I</b>	1						
<b> </b>	1						
<b> </b>	1						
1							
1							
<b>I</b>							
<b>I</b>							