Schnabel Engineering

Project Name: Constellation Generation Group COLA Project
Calvert Cliffs Nuclear Power Plant (CCNPP)
Calvert County, Maryland

Project Number: 06120048.00

SUMMARY OF SOIL LABORATORY TEST RESULTS - COMPOSITE SAMPLES[1]

Sample ID Number	Boring/ Test Pit No.	Sample Top Depth (ft.)	Sample Type[2]	USCS Sample Class. (D 2487)[3]	Sieve Results (D 422)	
					Percent Passing No. 200	Percent Retained No. 4
C-1A	B-301	43.5	UD	MH	99.2	0.0
C-2A	B-303	73.5 78.5	SPT	SM	18.7	2.6
C-3A	B-318	43.5 48.5	SPT	CH	81.9	0.0
C-4A	B-323 B-324	33.5 32.5	SPT	SP-SM	5.9	0.0
C-5A	B-335	63.5 68.5	SPT	SM	18.3	6.1
C-6A	B-401	63.5 73.5	SPT	SM	15.1	11.6
C-7A	B-402	23.5 28.5	SPT	CH	97.6	0.0
C-8A	B-422	48.5	UD	CH	94.7	0.0
C-9A	B-424	33.5 38.5	SPT	SP-SM	9.6	0.0
C-10A	B-428 B-429	38.5 38.5	SPT	SP-SM	7.2	0.0
C-11A	B-428	63.0	UD	CH/OH	92.0	0.0
C-12A	B-705	43.5 48.5	SPT	SM	15.3	0.1
C-13A	B-708	23.5 28.5	SPT	SM	13.4	30.6
C-14A	B-711	28.5 33.5	SPT	SM	12.7	7.9
C-15A	B-725	48.5 53.5	SPT	SP-SM	11.6	4.2
C-16A	B-735	63.5 68.5	SPT	SM	14.5	6.8
C-17A	B-744	48.5 53.5	SPT	SM	31.6	0.0
C-18A	B-756	33.5 38.5	SPT	SC	34.4	3.0
C-19A	B-768	43.5	UD	SM	15.7	0.0
C-20A	B-769	43.5 48.5	SPT	SC	13.8	0.0

NOTES:

1. Tests are in accordance with applicable ASTM standards
2. Sample type: SPT = sample obtained from split spoon, UD = undisturbed sample in thin walled sampler
3. Visual-manual procedures (ASTM D 2488) used as appropriate.

SUMMARY OF CHEMCIAL LABORATORY TEST RESULTS – SOIL AND WATER

Schnabel Engineering

Project Name: Constellation Generation Group COLA Project
Calvert Cliffs Nuclear Power Plant (CCNPP)
Calvert County, Maryland

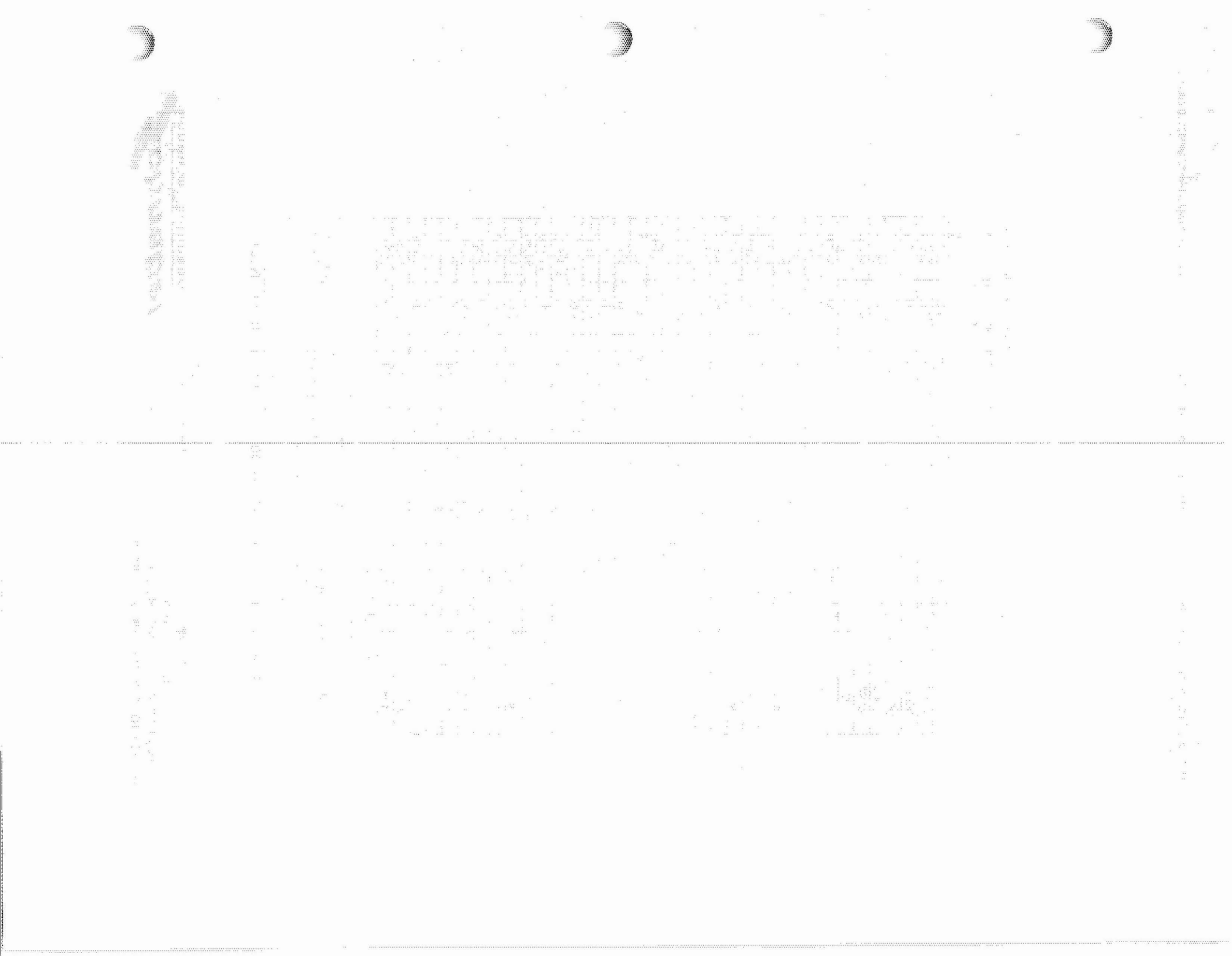
Project Number: 06120048.00

SUMMARY OF CHEMICAL LABORATORY TEST RESULTS - SOIL[1]

Boring/ Test Pit ID	Depth (ft.)	Sample Type[2]	USCS Sample Class. (D 2487)[3]	Chemical Testing			
				Chloride [mg/kg] (EPA 300.0)	pH in Calcium Chloride [S.U.] (D 4972)	pH in Deionized Water [S.U.] (D 4972)	Sulfate [mg/kg] (EPA 300.0)
B-307	43.5	SPT	SM	<10.0	3.3	3.7	668
B-307	73.5	SPT	SC	<10.0	2.5	2.7	18400
B-307	88.5	SPT	SM	<10.0	7	7.2	1200
B-313	10.5	SPT	ML	<10.0	3.3	3.9	82.8
B-313	18.5	SPT	SP-SM	<10.0	4.1	4.9	99.6
B-313	38.5	SPT	SM	19.3	6.6	6.9	880
B-315	10.5	SPT	SM	<10.0	4.9	5.8	65.3
B-315	33.5	SPT	SM	73.2	6.9	7	334
B-315	43.5	SPT	SM	<10.0	6.4	6.7	7170
B-316	38.5	SPT	CL	<10.0	2.7	2.7	25900
B-316	58.5	SPT	SC	<10.0	2.7	2.9	22600
B-316	63.5	SPT	SC	<10.0	2.8	2.9	16400
B-317	23.5	SPT	ML	<10.0	3.7	4.9	194
B-317	33.5	SPT	CH	<10.0	2.7	2.9	18900
B-317	58.5	SPT	SP-SM	<10.0	5.2	5.6	264
B-317	73.5	SPT	SC	<10.0	6.9	6.8	569
B-321	7.5	SPT	CL	<10.0	3.5	5	36.6
B-321	13.5	SPT	SC	<10.0	2.8	2.8	22300
B-321	33.5	SPT	SP-SM	<10.0	2.8	2.9	17700
B-328	0.2	SPT	SP-SM	<10.0	3.9	4.2	39.7
B-328	7.5	SPT	CH	<10.0	2.8	3.1	16400
B-328	48.5	SPT	ML	<10.0	6.3	6.4	4690
B-334	18.5	SPT	CL	<10.0	2.6	2.7	12400
B-334	28.5	SPT	CH	<10.0	2.6	2.7	14000
B-334	43.5	SPT	SM	70.8	2.7	2.8	20800
B-334	53.5	SPT	SP-SM	72.9	6.6	6.6	1130
B-336	13.5	SPT	SC	<10.0	3.7	4.7	20.9
B-336	28.5	SPT	CH	<10.0	2.7	2.9	15400
B-336	48.5	SPT	CL	<10.0	2.8	2.7	8050
B-336	68.5	SPT	SM	<10.0	6.6	6.7	3240
B-336	83.5	SPT	SM	<10.0	6.6	6.6	2540
B-336	98.5	SPT	SC	<10.0	6.8	6.9	2900
B-337	33.5	SPT	ML	<10.0	2.9	3.1	6090
B-337	48.5	SPT	SC	<10.0	6.1	6.2	11500
B-337	73.5	SPT	SM	<10.0	6.7	6.8	2850
B-337	88.5	SPT	SM	<10.0	6.88	7	1350

NOTES:

1. Tests are in accordance with applicable EPA and ASTM standards
2. Sample type: SPT = sample obtained from split spoon; UD = undisturbed sample in thin walled samples
3. Visual-manual procedures (ASTM D 2488) used as appropriate.



Schnabel Engineering

Project Name: Constellation Generation Group COLA Project
Calvert Cliffs Nuclear Power Plant (CCNPP)
Calvert County, Maryland

Project Number: 06120048.00

SUMMARY OF CHEMICAL LABORATORY TEST RESULTS - SOIL[1]

Boring/ Test Pit ID	Depth (ft.)	Sample Type[2]	USCS Sample Class. (D 2487)[3]	Chemical Testing			
				Chloride [mg/kg] (EPA 300.0)	pH in Calcium Chloride [S.U.] (D 4972)	pH in Deionized Water [S.U.] (D 4972)	Sulfate [mg/kg] (EPA 300.0)
B-401	2.5	SPT	SM	<10.0	4.2	5.1	56.2
B-401	33.5	SPT	SP	<10.0	4.6	5.3	100
B-401	53.5	SPT	SM	<10.0	6.9	6.9	1670
B-401	78.5	SPT	SM	29.1	7.4	8	537
B-407	10.5	SPT	SP-SM	<10.0	5.1	5.7	37.4
B-407	28.5	SPT	MH	<10.0	2.9	2.5	8270
B-407	63.5	SPT	SM	<10.0	6.5	6.6	2830
B-414	7.5	SPT	SP-SM	<10.0	5.4	6.8	24.4
B-414	18.5	SPT	SP-SM	<10.0	4.6	5.9	52.7
B-414	33.5	SPT	SP-SM	<10.0	4.1	4.9	37.8
B-414	63.5	SPT	CH	<10.0	2.7	2.9	7820
B-414	78.5	SPT	ML	71	3.6	3.8	2660
B-420	2.5	SPT	CH	10.7	3.4	4.5	188
B-420	18.5	SPT	CH	<10.0	2.5	2.5	31300
B-420	33.5	SPT	SM	<10.0	2.4	2.5	30600
B-420	53.5	SPT	SM	<10.0	6.3	6.6	5170
B-420	73.5	SPT	SM	<10.0	6.5	6.9	1160
B-420	93.5	SPT	CH	<10.0	6.6	7	1960
B-421	23.5	SPT	SM	<10.0	6.7	7.4	87.7
B-421	38.5	SPT	SP-SM	<10.0	6.6	7.6	24.6
B-421	43.5	SPT	MH	<10.0	3.9	4.8	79.8
B-421	53.5	SPT	CH	<10.0	2.8	2.6	7720
B-421	63.5	SPT	CH	<10.0	3.3	3.4	6370
B-421	78.5	SPT	SM	<10.0	6.9	7	2950
B-421	88.5	SPT	SM	<10.0	6.7	6.8	2110
B-421	103.5	SPT	SM	<10.0	6.8	7	2640
B-423	18.5	SPT	SM	48.6	5.5	5.9	104
B-423	28.5	SPT	SM	10.8	5.9	6.9	13.8
B-423	83.5	SPT	SM	16.6	6.8	6.5	1960
B-427	7.5	SPT	SP-SM	<10.0	5.4	7.5	20
B-427	38.5	SPT	SP	<10.0	6.1	6.7	58.8
B-427	78.5	SPT	SM	<10.0	6	6	1170
B-433	5.0	SPT	ML	<10.0	3.9	4.8	139
B-433	23.5	SPT	SW-SM	<10.0	4.8	5.6	46.4
B-433	33.5	SPT	MH	<10.0	3.8	5	60.3
B-434	7.5	SPT	SP-SM	<10.0	4	5.2	94.2
B-434	18.5	SPT	SP-SM	<10.0	4.8	5.7	43
B-434	33.5	SPT	SM	<10.0	2.6	2.7	25700
B-434	68.5	SPT	SM	145	6.6	6.8	393
B-434	78.5	SPT	SM	<10.0	6.8	7	1530
B-434	88.5	SPT	SM	<10.0	6.8	7.1	1050

NOTES:

1. Tests are in accordance with applicable EPA and ASTM standards.
2. Sample type: SPT = sample obtained from split spoon, UD = undisturbed sample in thin walled sampler
3. Visual-manual procedures (ASTM D 2488) used as appropriate.

Schnabel Engineering

Project Name: Constellation Generation Group COLA Project
Calvert Cliffs Nuclear Power Plant (CCNPP)
Calvert County, Maryland

Project Number: 06120048.00

SUMMARY OF CHEMICAL LABORATORY TEST RESULTS - SOIL[1]

Composite Sample ID	Boring/ Test Pit ID	Depth (ft.)	Sample Type[2]	USCS Sample Class. (D 2487)[3]	Chemical Analysis		
					pH in Calcium Chloride [S.U.] (D 4972)	pH in Deionized Water [S.U.] (D 4972)	Cation Exchange Capacity [meq/100g] (EPA 9081)
C-1b	B-301	43.5	UD	MH	5.9	6.0	26.3
C-2b	B-303	73.5 78.5	SPT	SM	7.6	7.6	7.8
C-3b	B-318	43.5 48.5	SPT	CH	2.5	2.6	27.9
C-4b	B-323 B-324	33.5 32.5	SPT	SP-SM	4.6	5.9	1.6
C-5b	B-335	63.5 68.5	SPT	SM	7.0	7.0	10.1
C-6b	B-401	63.5 73.5	SPT	SM	7.4	7.4	8.0
C-7b	B-402	23.5 28.5	SPT	CH	2.9	3.0	31.9
C-8b	B-422	48.5	UD	CH	4.8	4.9	22.8
C-9b	B-424	33.5 38.5	SPT	SP-SM	5.0	5.8	3.1
C-10b	B-428 B-429	38.5 38.5	SPT	SP-SM	7.1	7.8	2.0
C-11b	B-428	63.0	UD	CH/OH	3.8	3.9	24.9
C-12b	B-705	43.5 48.5	SPT	SM	7.3	7.3	7.0
C-13b	B-708	23.5 28.5	SPT	SM	7.3	7.4	7.2
C-14b	B-711	28.5 33.5	SPT	SM	7.7	7.8	6.6
C-15b	B-725	48.5 53.5	SPT	SP-SM	7.7	7.8	8.5
C-16b	B-735	63.5 68.5	SPT	SM	7.7	7.7	6.6
C-17b	B-744	48.5 53.5	SPT	SM	3.0	3.4	16.8
C-18b	B-756	33.5 38.5	SPT	SC	5.8	6.4	9.6
C-19b	B-768	43.5	UD	SM	7.1	7.2	6.8
C-20b	B-769	43.5 48.5	SPT	SC	4.8	4.9	7.2

NOTES:

1. Tests are in accordance with applicable EPA and ASTM standards.
2. Sample type: SPT = sample obtained from split spoon, UD = undisturbed sample in thin walled sampler
3. Visual-manual procedures (ASTM D 2488) used as appropriate.

Schnabel Engineering

Project Name: Constellation Generation Group COLA Project
Calvert Cliffs Nuclear Power Plant (CCNPP)
Calvert County, Maryland

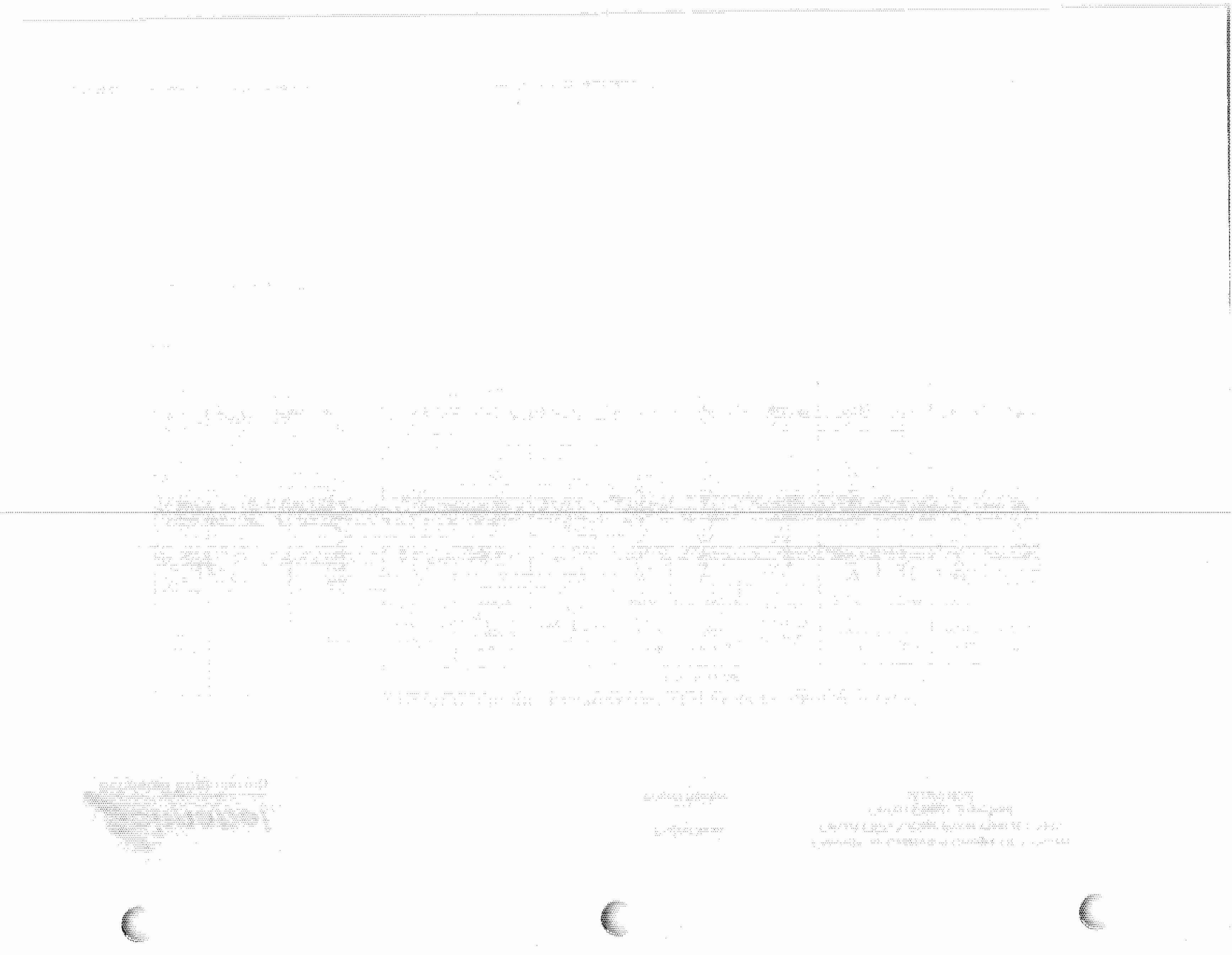
Project Number: 06120048.00

SUMMARY OF CHEMICAL LABORATORY TEST RESULTS - GROUND WATER[1]

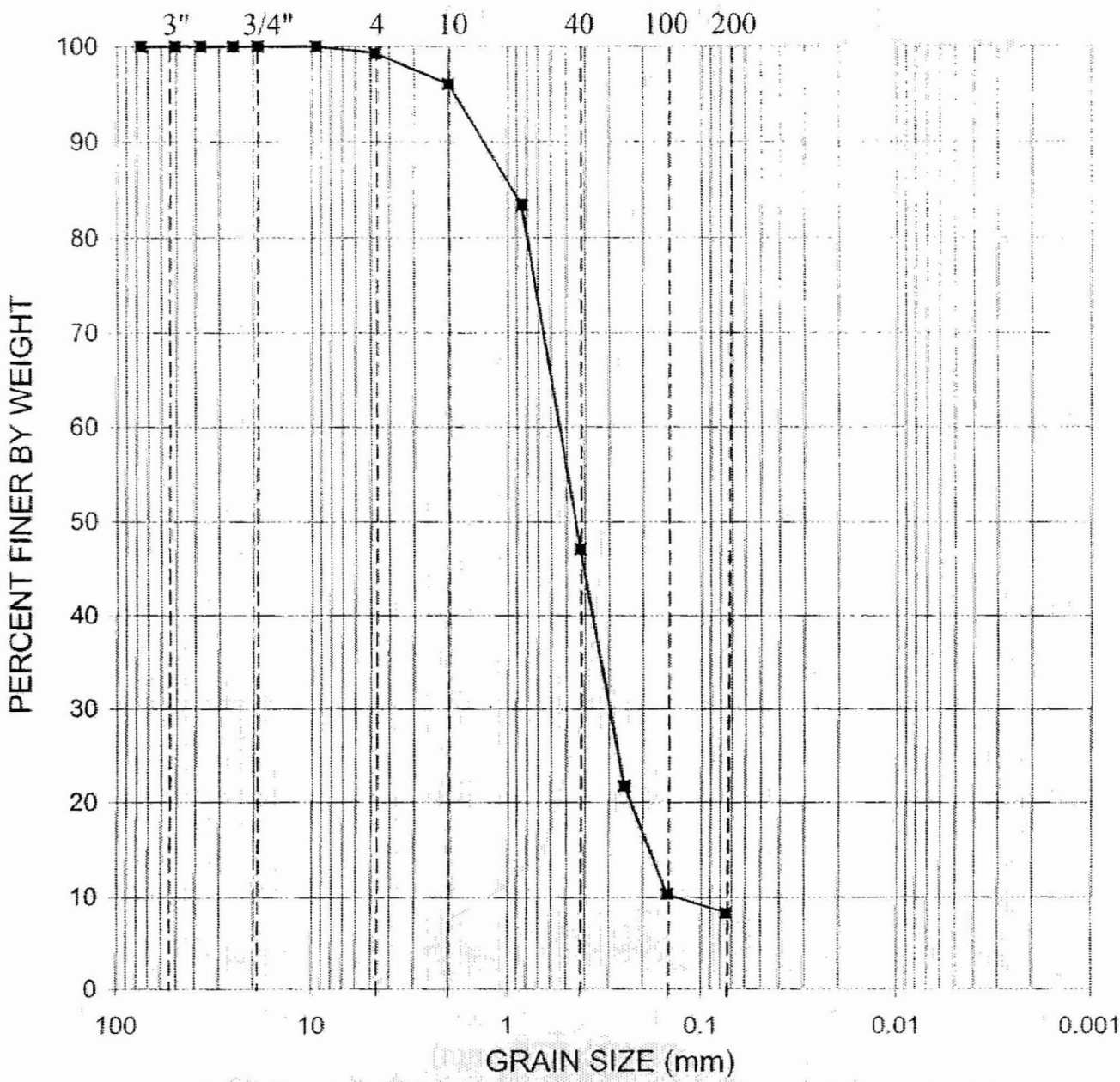
Sample ID	Well No.	Sample Type	Chemical Analysis									
			Alkalinity, Total [mg/L] (EPA 310.1)	Ammonia Nitrogen [mg/L] (EPA 350.1)	Bromide [mg/L] (EPA 300.0)	Chloride [mg/L] (EPA 300.0)	Dissolved Solids [mg/L] (EPA 160.1)	Fluoride [mg/L] (EPA 300.0)	Nitrate [mg/L] (EPA 300.0)	Nitrite [mg/L] (EPA 300.0)	Sulfate [mg/L] (EPA 300.0)	Sulfide [mg/L] (EPA 376.1)
OW-301-1	OW-301	Grab	166	<0.04	<1.00	10.7	182	<0.20	<0.2	<0.2	8.8	<1.0
OW-301-2	OW-301	Grab	170	<0.04	<1.00	10.7	151	<0.20	<0.2	<0.2	8.8	<1.0
OW-322	OW-322	Grab	8.0	<0.04	<1.00	9.8	27	<0.20	<0.2	<0.2	2.6	<1.0
OW-336	OW-336	Grab	163	<0.04	<1.00	8.6	251	0.28	<0.2	<0.2	29.5	<1.0
OW-401	OW-401	Grab	196	<0.04	<1.00	6.5	268	0.28	<0.2	<0.2	28.2	<1.0
OW-423	OW-423	Grab	10.8	<0.04	<1.00	28.1	71	<0.20	1.4	<0.2	12.8	<1.0
OW-428	OW-428	Grab	7.0	<0.04	<1.00	17.3	72	<0.20	0.6	<0.2	6.8	<1.0
OW-705	OW-705	Grab	191	<0.04	<1.00	20.1	295	0.40	<0.2	<0.2	37.4	<1.0
OW-708A	OW-708A	Grab	350	0.06	<1.00	40.8	453	<0.20	<0.2	<0.2	40.7	<1.0
OW-711	OW-711	Grab	207	<0.04	<1.00	9.2	242	<0.20	<0.2	<0.2	14.9	<1.0
OW-725	OW-725	Grab	60.0	<0.04	<1.00	6.7	236	0.20	<0.2	<0.2	16.6	<1.0
OW-735	OW-735	Grab	75.0	<0.04	<1.00	6.5	108	<0.20	<0.2	<0.2	12.9	<1.0
OW-744	OW-744	Grab	22.0	<0.04	<1.00	5.3	231	<0.20	<0.2	<0.2	18.1	<1.0
OW-752A	OW-752A	Grab	25.0	<0.04	<1.00	6.4	125	<0.20	<0.2	<0.2	68.6	<1.0
OW-768A	OW-768A	Grab	301	<0.04	<1.00	12.4	400	0.21	<0.2	<0.2	70.6	<1.0
OW-769	OW-769	Grab	241	<0.04	<1.00	7.6	264	<0.20	<0.2	<0.2	22.8	<1.0

Surficial Aquifer
Upper Chesapeake

NOTES:
1. Tests are in accordance with applicable EPA standards.



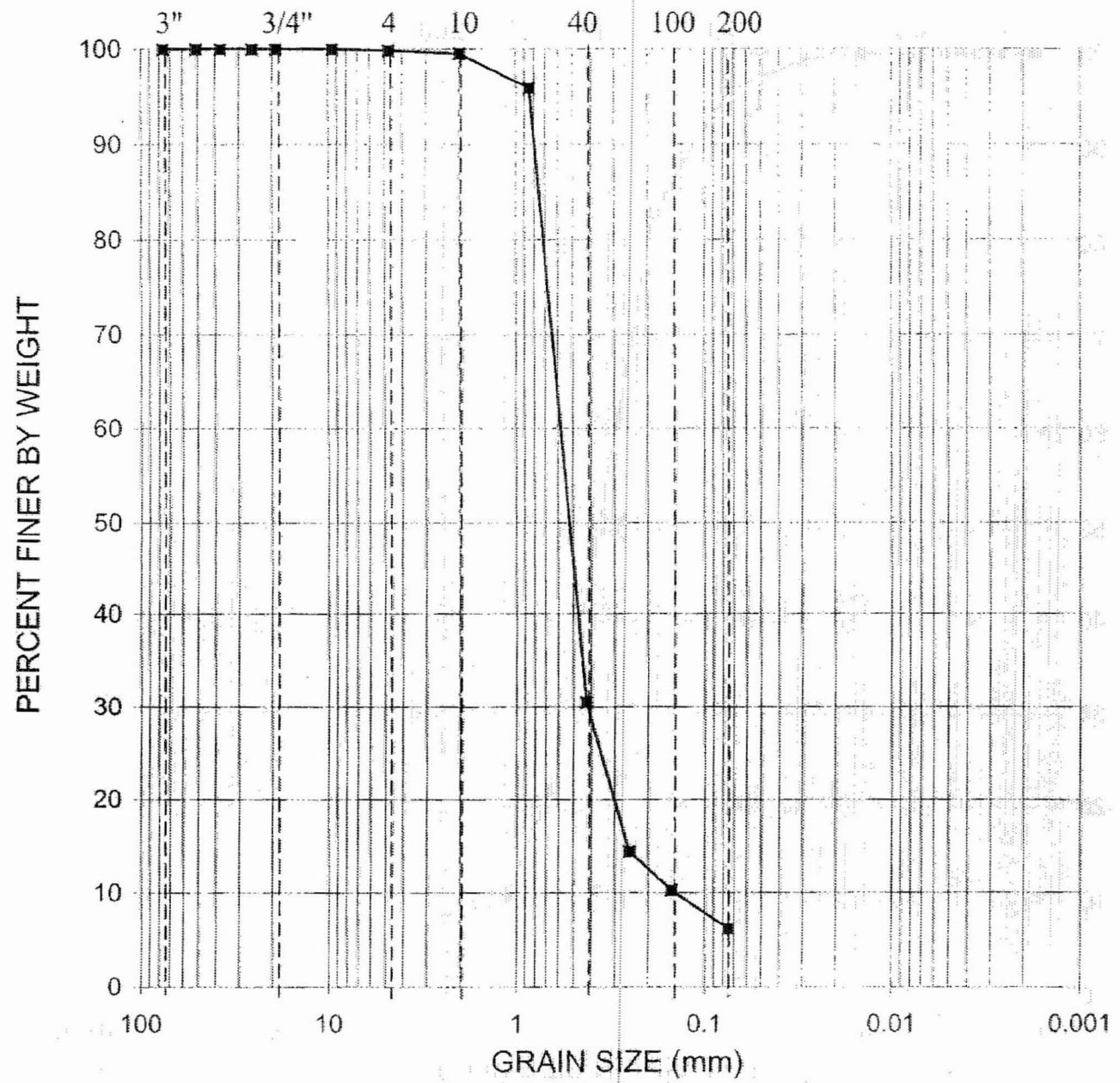
GRADATION CURVES



GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/14/2006	
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI	
B-301	2.5	Poorly Graded SAND, with silt, trace gravel, brown	SP-SM			Schnabel Engineering



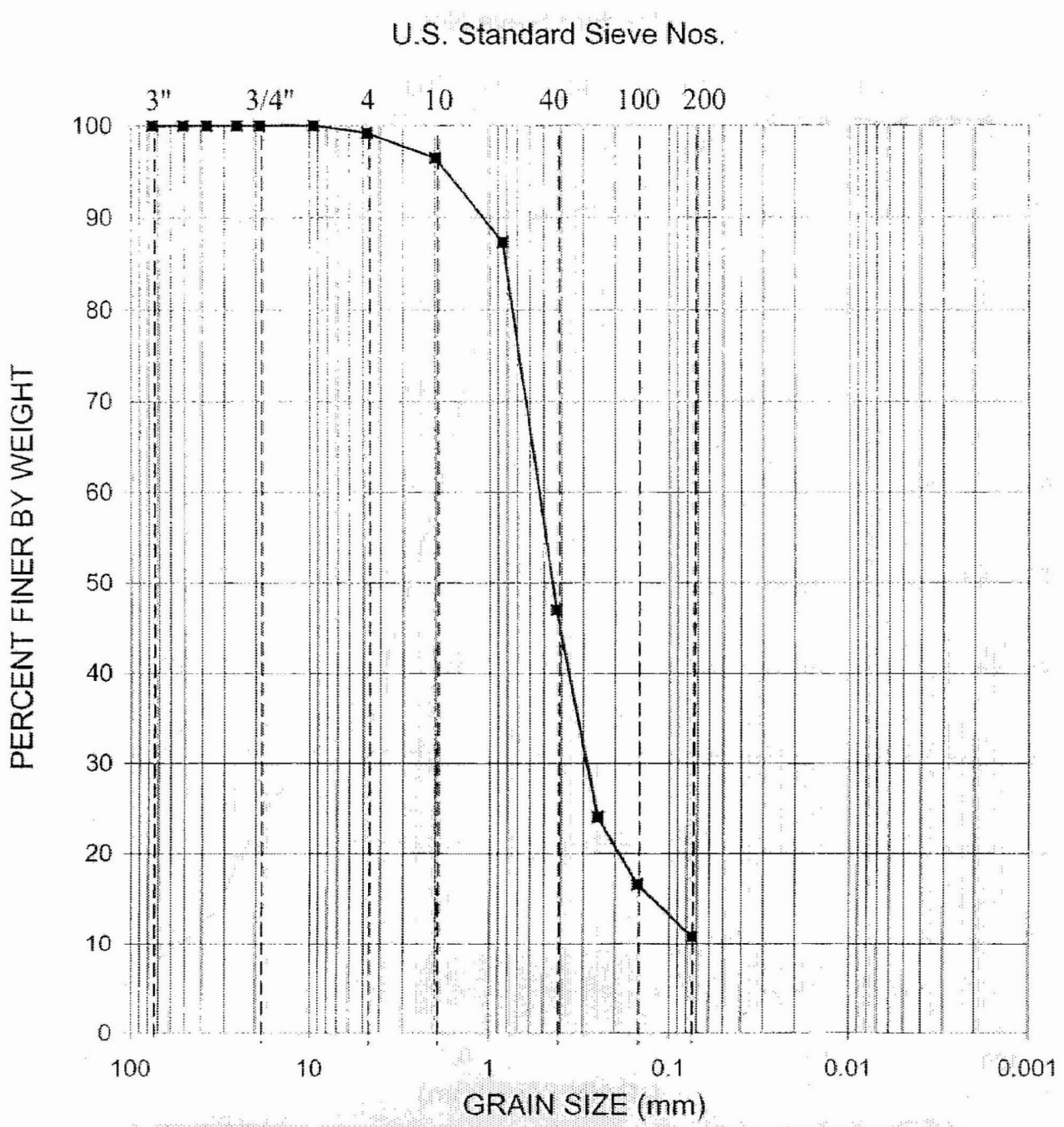
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/14/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-301	10.5	Poorly Graded SAND, with silt, brown	SP-SM		

Schnabel Engineering



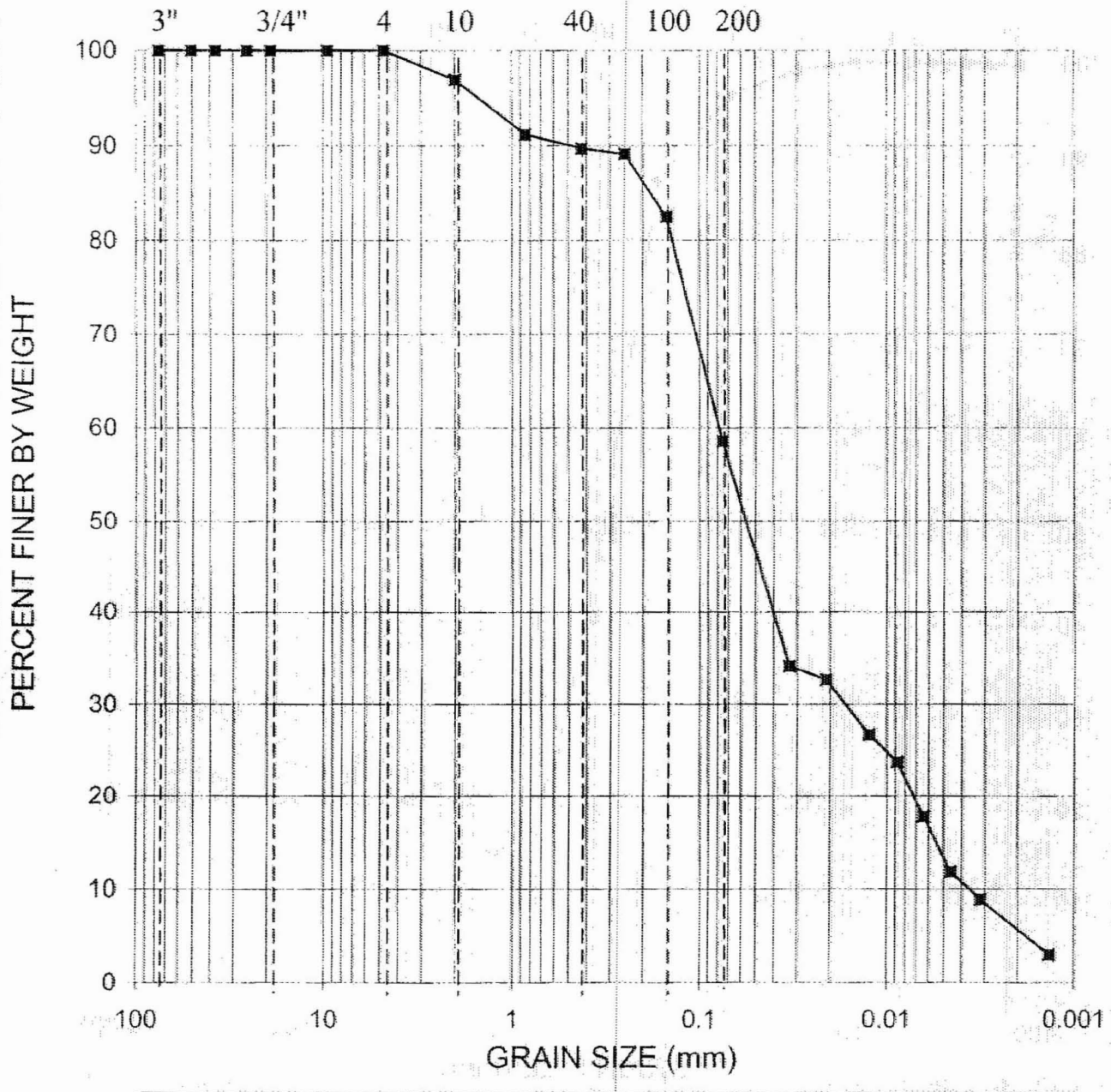
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland	Contract No.: 06120048.00	Date: 8/14/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-301	18.5	Poorly Graded SAND, with silt, trace gravel, brown	SP-SM		

Schnabel Engineering



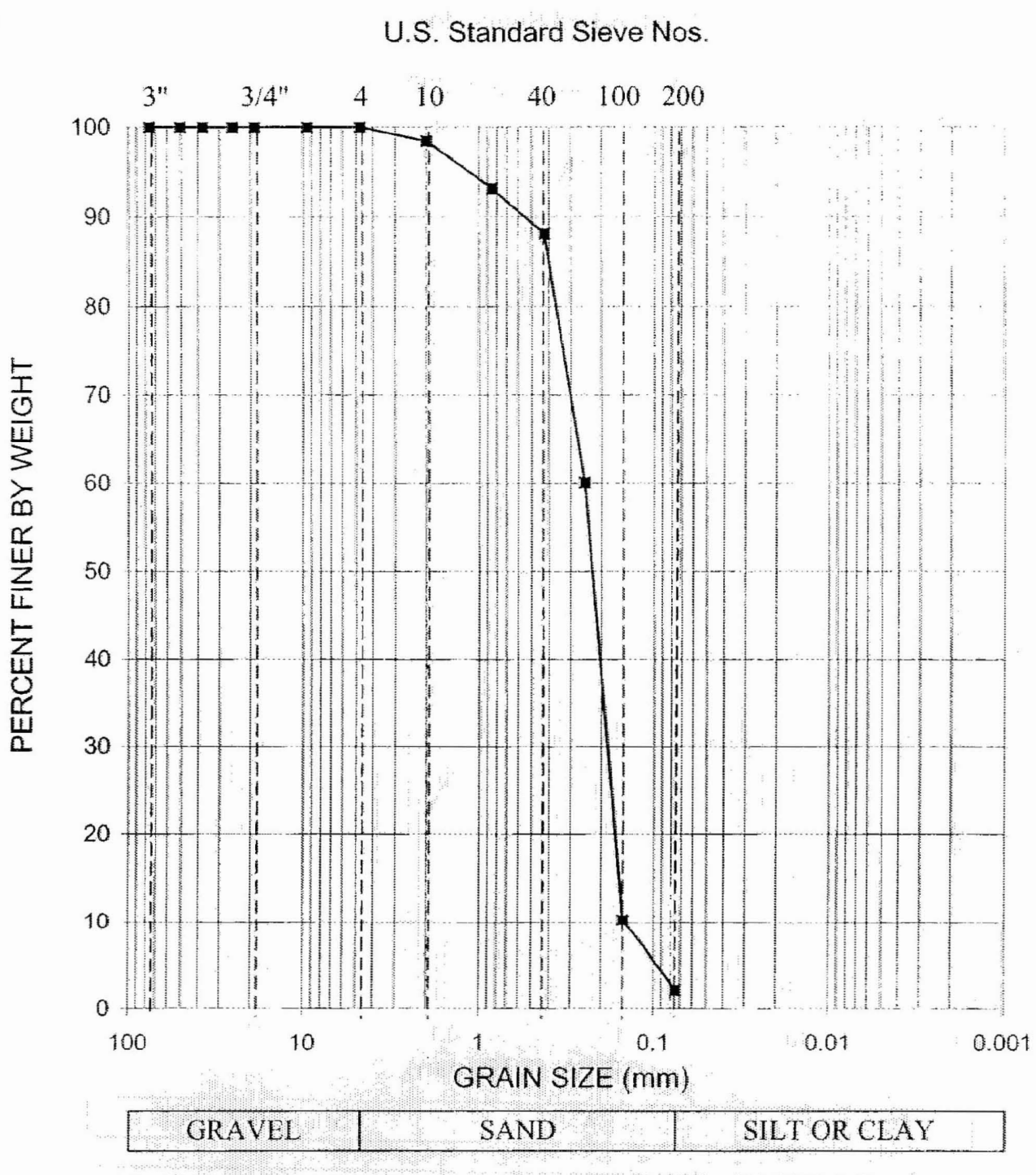
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/19/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-301	28.5	Sandy LEAN CLAY, dark gray	CL	48	31

Schnabel Engineering



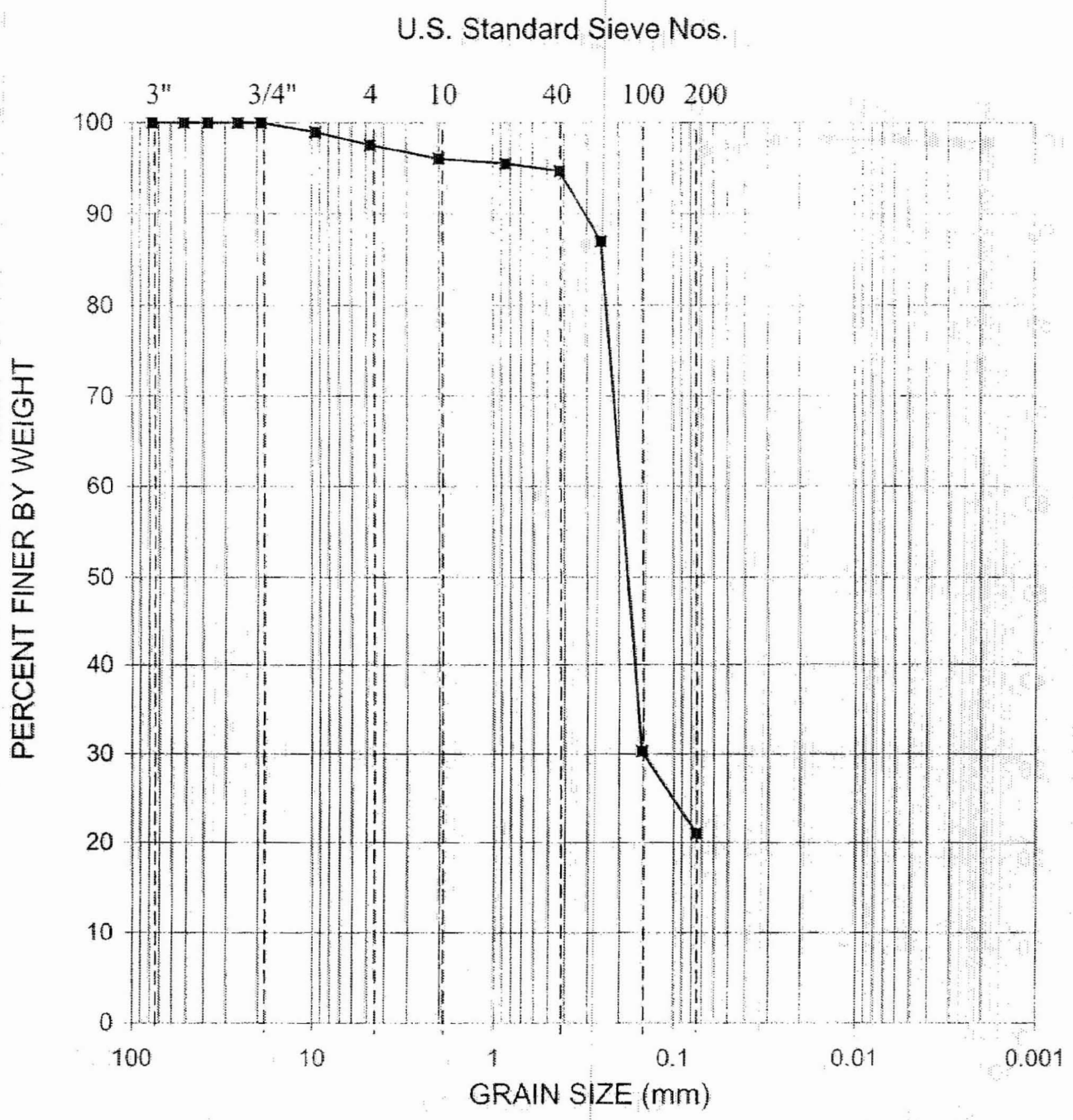
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/14/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-301	63.5	Poorly Graded SAND, trace silt, contains shells, gray	SP		

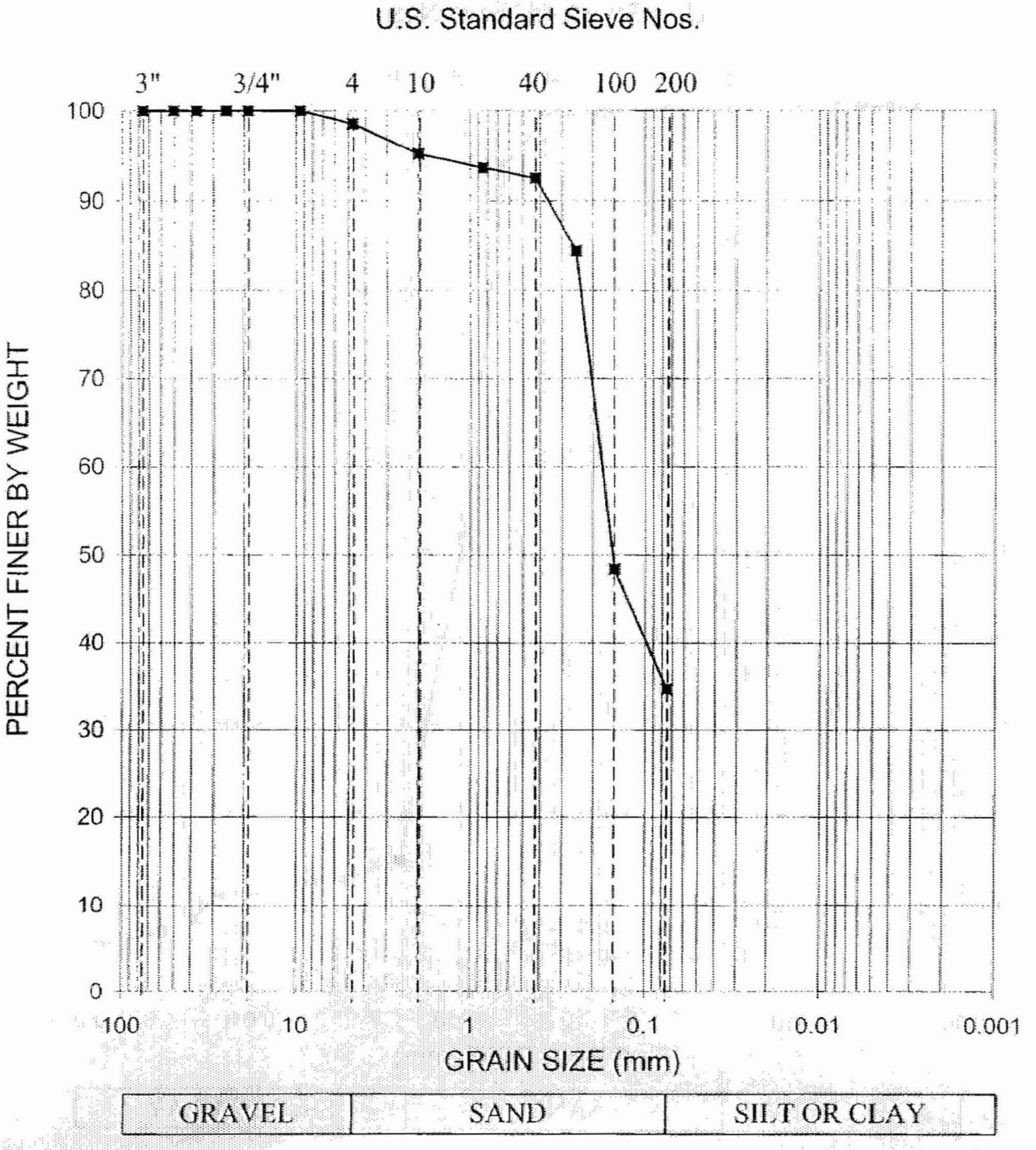
Schnabel Engineering



GRADATION CURVE

ASTM D422

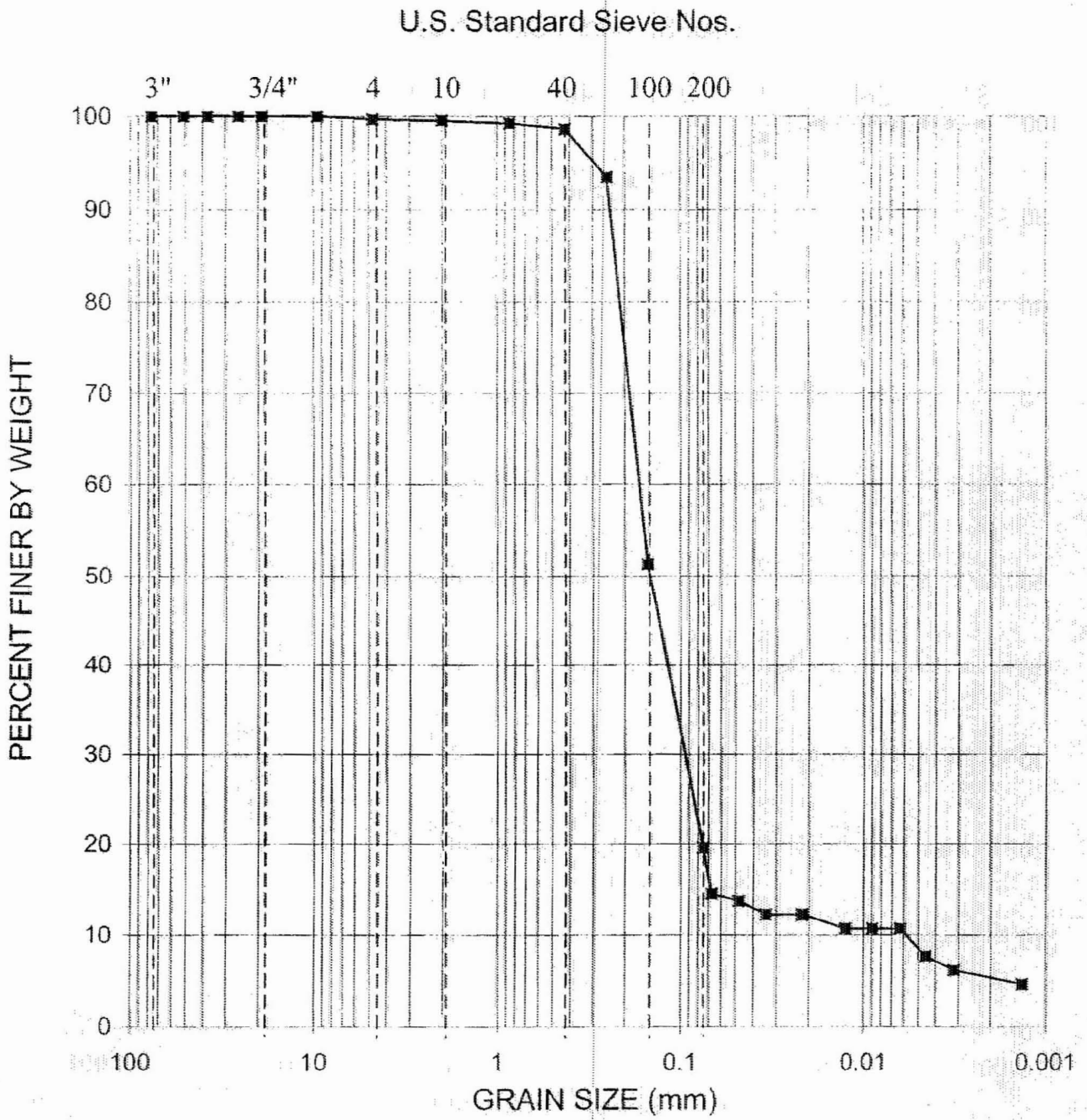
Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/14/2006	
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI	
B-301	83.5	Silty SAND, trace shells, dark gray	SM			Schnabel Engineering



GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/14/2006	
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI	
B-301	108.5	Silty SAND, trace shells, gray	SM			Schnabel Engineering



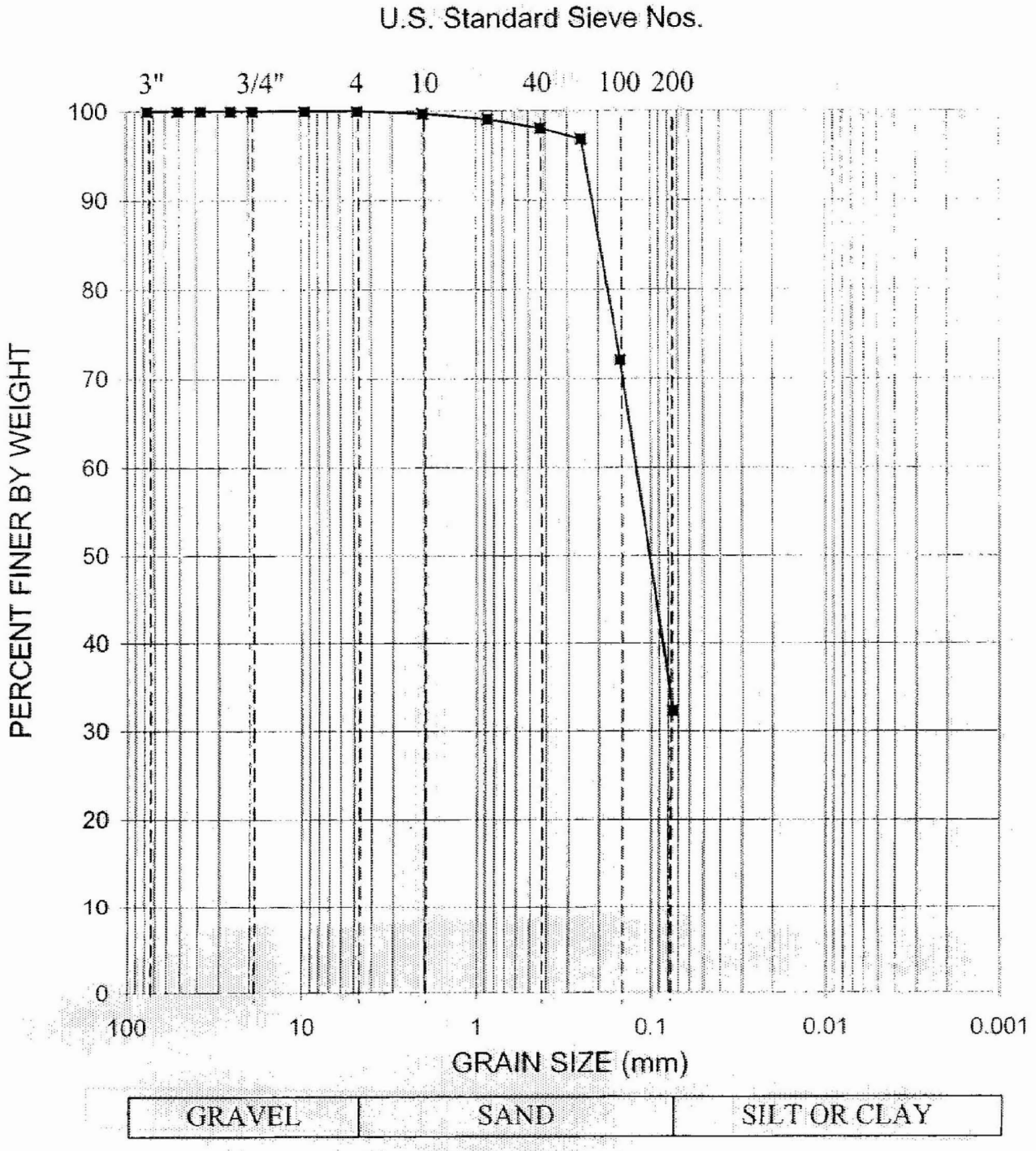
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland	Contract No.:	06120048.00	Date:	8/19/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-301	118.5	Silty SAND, contains shells, dark green	SM		

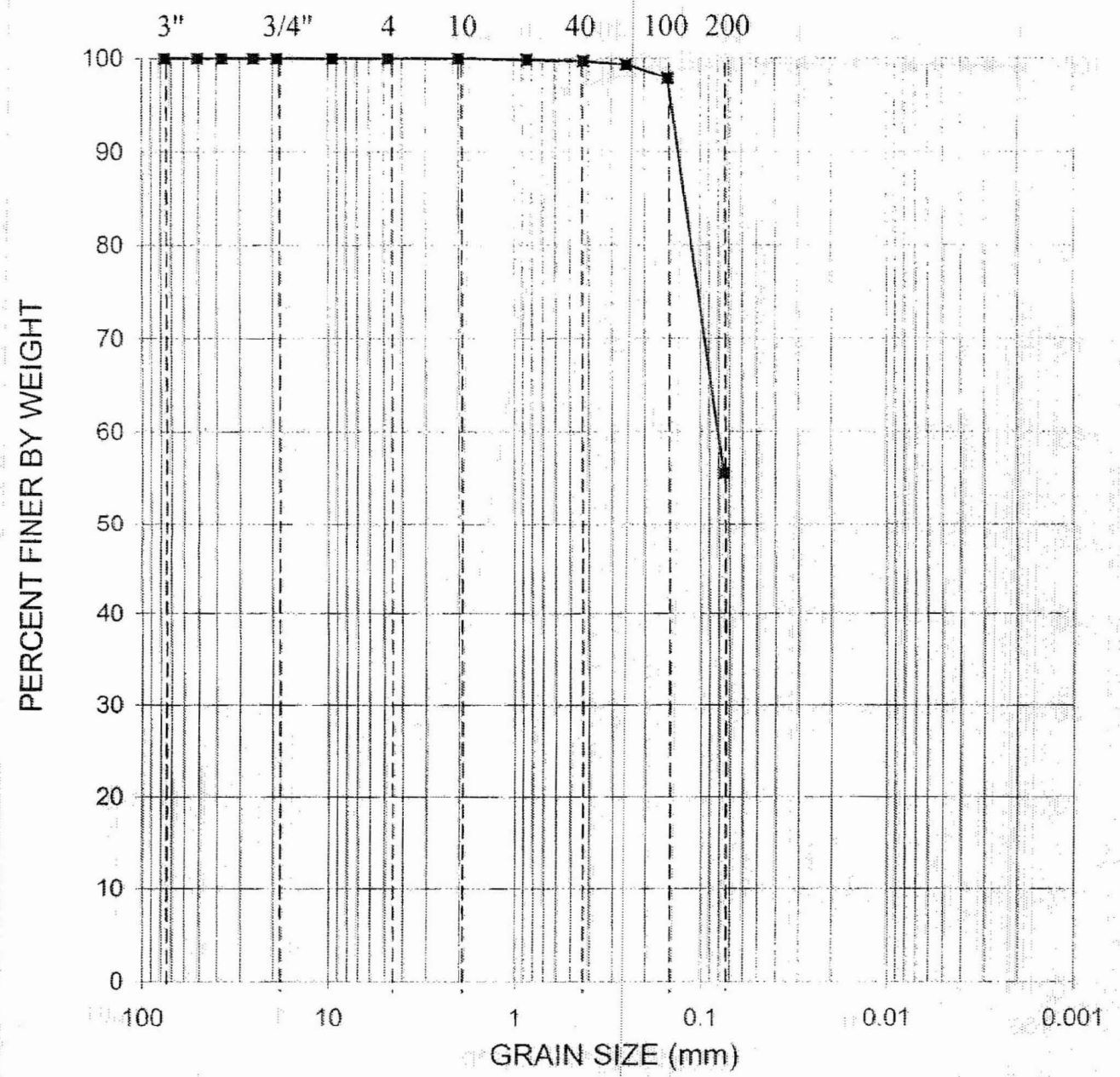
Schnabel Engineering



GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/14/2006	
Boring No.	Depth (ft)	Sample Description	Class.	LL	PI	
B-301	128.5	CLAYEY SAND , dark green	SC			Schnabel Engineering



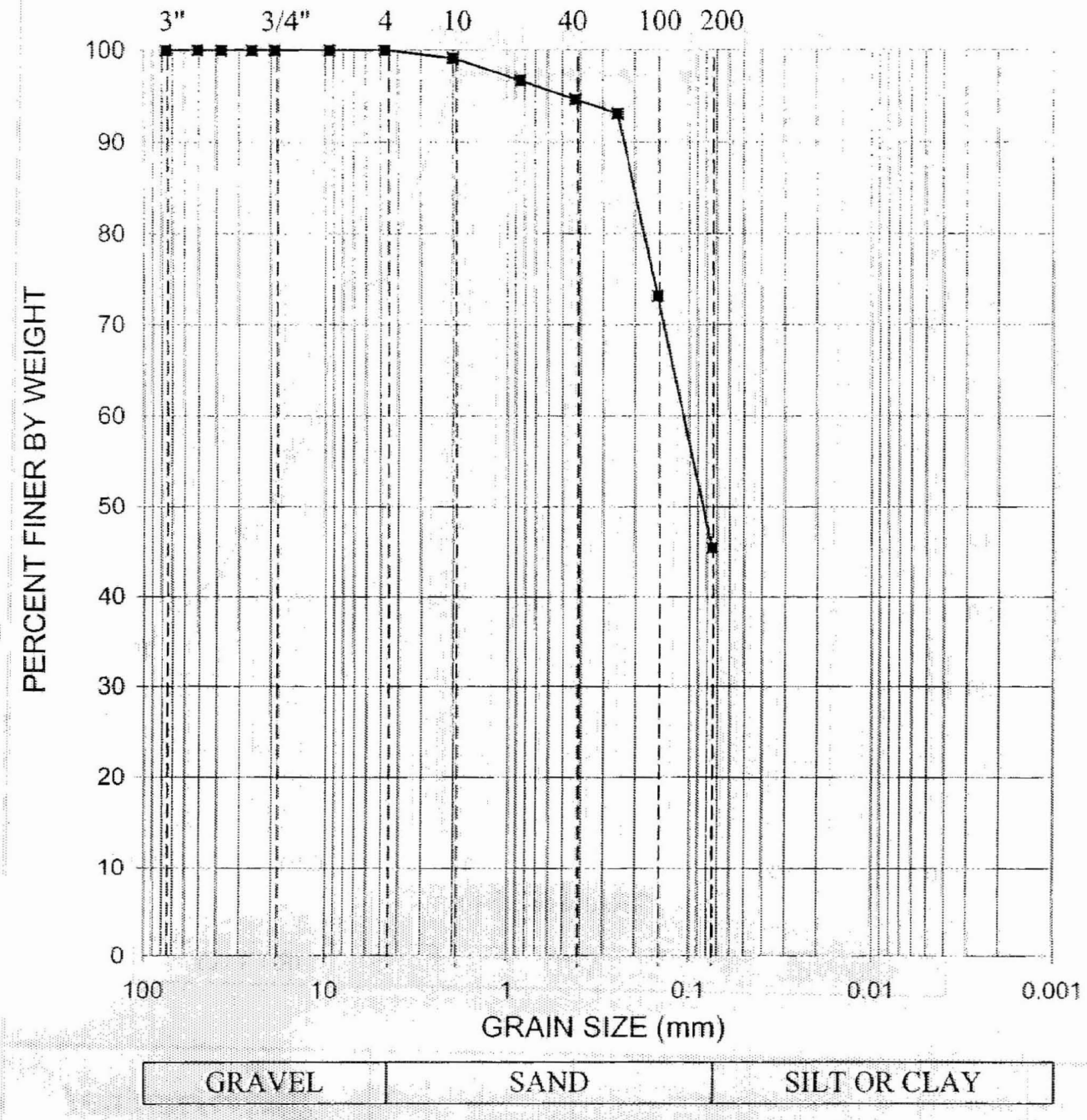
GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland	Contract No.: 06120048.00	Date: 8/14/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-301	143.5	Sandy LEAN CLAY, dark green	CL		

Schnabel Engineering



GRADATION CURVE

ASTM D422

Project:	Constellation Energy Group COLA Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland		Contract No.: 06120048.00		Date: 8/14/2006

Boring No.	Depth (ft)	Sample Description	Class.	LL	PI
B-301	153.5	SILTY SAND, contains shells, dark green	SM		

Schnabel Engineering