GEOTECHNICAL BORING LOG

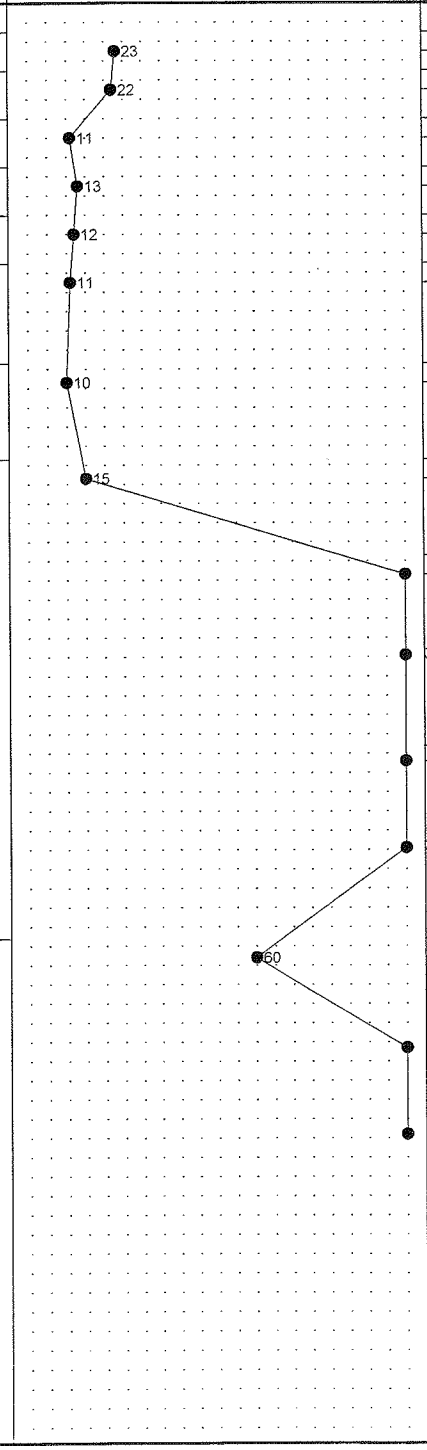
MACTEC

MACTEC PROJECT NO.: 6468-06-1472	COUNTY Louisa, VA	GEOLOGIST S.Lehman
SITE DESCRIPTION NORTH ANNA COL		GROUND WATER (ft)
BORING NO. B-908	DRILL METHOD: Rotary Wash/Core	SAMPLE METHODS: SPT/CORE
COLLAR ELEV. 307.7 ft (NAVD88)	NORTHING 3,909,717 US ft (NAD83)	EASTING 11,686,061 US ft (NAD83)
TOTAL DEPTH 151.4 ft	DRILL MACHINE CME 55LC Track	DRILLER: F. Cox
DATE STARTED 9/13/06	COMPLETED 9/18/06	CORE BARREL TYPE: HQ 3 triple tube-wireline

GROUND WATER (ft)	
0 HR.	16.0
24 HR.	17.1

HAMMER TYPE 140 lbs Auto

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	SAMP. NO.	SOIL AND ROCK DESCRIPTION	ELEV.	DEPTH
307.7						Ground Surface	307.7	0.0
306.2	1.5					Silty, fine to medium SAND (SM) olive yellow (2.5Y 6/6) dry, medium dense (Residual Soil)		
304.2	3.5	11	11	12	908-1		304.2	3.5
301.7	6.0	28	13	9	908-2	GRAVEL (GM) boulder of Weathered Rock: Light brown, very severely weathered, very soft to hard, GNEISS	302.7	5.0
299.2	8.5	6	6	5	908-3	Silty, fine to medium SAND (SM) strong brown to light yellowish brown (2.5Y 6/4) dry to moist, medium dense, saprolitic (Residual Soil)		
296.7	11.0	4	6	7	908-4			
294.2	13.5	3	4	8	908-5			
289.0	18.7	7	6	5	908-6		291.7	16.0
						SILT (ML) yellowish brown (10YR 5/6) moist, stiff, sandy (Residual Soil)		
284.0	23.7	2	5	5	908-7		286.7	21.0
						Silty, fine SAND (SM) dark yellowish brown (10YR 4/6), moist, medium dense, (Residual Soil)		
279.0	28.7	5	6	9	908-8		280.7	27.0
274.1	33.6	49	50/0.5		908-9	Weathered Rock: sampled as SAND (SW), brownish yellow (10YR 6/6) to strong brown (7.5YR 5/6), moist, very dense, fine to coarse grained, Fe stained (GNEISS)		
269.1	38.6	50/0.3			908-10			
264.1	43.6	48	50/0.3		908-11			
259.1	48.6	50/0.3			908-12		261.2	46.5
						Silty, fine SAND (SM) olive brown (2.5Y 4/4), moist, very dense (Residual Soil)		
254.1	53.6	15	28	32	908-13		256.2	51.5
249.1	58.6	28	50/0.2		908-14	Weathered Rock: sampled as silty SAND (SM) dark yellowish brown (10YR 4/6), light reddish brown to light gray, moist, very dense, severely weathered, soft to moderately hard, GNEISS		
		50/0.2			908-15			
						Hard Rock: Light gray with orange Fe staining, moderately severe to slightly weathered, close to moderately close fracturing, soft to moderately hard, QUARTZ GNEISS with biotite	245.0	62.7



NORTH ANNA COL CORE NORTH ANNA COL DATA REPORT REV0.GPJ NORTH ANNA COL.GDT 1/19/07

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SITE DESCRIPTION NORTH ANNA COL			GROUND WATER (ft)
BORING NO. B-908	DRILL METHOD: Rotary Wash/Core	SAMPLE METHODS: SPT/CORE	0 HR. 16.0
COLLAR ELEV. 307.7 ft (NAVD88)	NORTHING 3,909,717 US ft (NAD83)	EASTING 11,686,061 US ft (NAD83)	24 HR. 17.1
TOTAL DEPTH 151.4 ft	DRILL MACHINE CME 55LC Track	DRILLER: F. Cox	HAMMER TYPE 140 lbs Auto
DATE STARTED 9/13/06	COMPLETED 9/18/06	CORE BARREL TYPE: HQ 3 triple tube-wireline	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
232.9					Continued from previous page				
									231.3 — 76.4 Hard Rock: Light gray, moderately weathered to fresh, close to wide fracturing, medium hard to hard, QUARTZ GNEISS with biotite
									206.3 — 101.4 Weathered Rock: Severely weathered, BIOTITE GNEISS (No recovery)
									204.0 — 103.7 Hard Rock: Dark gray, moderately severe to slightly weathered, close fracturing, soft to moderately hard, BIOTITE GNEISS
									201.3 — 106.4 Hard Rock: Light to dark gray, fresh, wide fracturing, hard, QUARTZ-BIOTITE GNEISS
									193.0 — 114.7 Weathered Rock: Severely weathered, BIOTITE GNEISS (No recovery)
									192.4 — 115.3 Hard Rock: Light to dark gray with pink, slightly weathered to fresh, close to wide fracturing, moderately hard to hard, QUARTZ-BIOTITE GNEISS with trace pyrite and magnetite

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SITE DESCRIPTION NORTH ANNA COL		GROUND WATER (ft)
BORING NO. B-908	DRILL METHOD: Rotary Wash/Core	SAMPLE METHODS: SPT/CORE	0 HR. 16.0
COLLAR ELEV. 307.7 ft (NAVD88)	NORTHING 3,909,717 US ft (NAD83)	EASTING 11,686,061 US ft (NAD83)	24 HR. 17.1
TOTAL DEPTH 151.4 ft	DRILL MACHINE CME 55LC Track	DRILLER: F. Cox	HAMMER TYPE 140 lbs Auto
DATE STARTED 9/13/06	COMPLETED 9/18/06	CORE BARREL TYPE: HQ 3 triple tube-wireline	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
158.1					Continued from previous page				
									156.3 — 151.4
									Boring and coring terminated at 151.4 ft in Hard Rock: Hard, QUARTZ-BIOTITE GNEISS

GEOTECHNICAL CORING LOG

MACTEC

MACTEC PROJECT NO.: 6468-06-1472	**COUNTY** Louisa, VA	**GEOLOGIST** S.Lehman
SITE DESCRIPTION NORTH ANNA COL		**GROUND WATER (ft)**
BORING NO. B-908	**DRILL METHOD:** Rotary Wash/Core	**SAMPLE METHODS:** SPT/CORE — **0 HR.** 16.0
COLLAR ELEV. 307.7 ft **(NAVD88)**	**NORTHING** 3,909,717 **US ft (NAD83)**	**EASTING** 11,686,061 **US ft (NAD83)** — **24 HR.** 17.1
TOTAL DEPTH 151.4 ft	**DRILL MACHINE** CME 55LC Track	**DRILLER:** F. Cox — **HAMMER TYPE** 140 lbs Auto
DATE STARTED 9/13/06	**COMPLETED** 9/18/06	**CORE BARREL TYPE:** HQ 3 triple tube-wireline
CORE SIZE HQ3	**TOTAL RUN** 88.7 ft	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 62.7 ft
245.0	62.7	3.7	2:12 3:10 3:22 2:47/0.7	(3.2) 86%	(1.7) 46%	1				245.0 — 62.7 Hard Rock: Light gray with orange Fe staining, moderately severe to slightly weathered, close to moderately close fracturing, soft to moderately hard, QUARTZ GNEISS with biotite
241.3	66.4	5.0	3:05 2:46 2:39 2:31 2:34	(5.0) 100%	(5.0) 100%	UC-67.5'				(2 joints at 20° with trace clay and Fe stain; 1 joint at 85° with Fe stain; 1 joint at 45° with trace clay and Fe stain) (1 joint at 40° and 2 joints at 20° with trace clay and Fe stain)
236.3	71.4	5.0	2:15 1:40 3:38 4:38 5:03	(4.8) 96%	(3.7) 74%	3				(5 joints at 45° weathered with Fe stain; 1 joint at 30° weathered)
231.3	76.4	5.0	3:50 2:50 2:20 2:50 2:21	(4.8) 96%	(4.8) 96%	UCS-79.4'				231.3 — 76.4 Hard Rock: Light gray, moderately weathered to fresh, close to wide fracturing, medium hard to hard, QUARTZ GNEISS with biotite (1 joint at 80° with Fe stain; 2 joints at 40° with trace clay and Fe stain)
226.3	81.4	5.0	2:28 2:13 2:15 2:38 3:08	(5.0) 100%	(5.0) 100%	5				(1 joint at 45° weathered)
221.3	86.4	5.0	2:04 1:52 2:16 2:04 1:50	(5.0) 100%	(5.0) 100%	6				(1 joint at 60°)
216.3	91.4	5.0	2:22 1:52 2:02 2:25 2:36	(4.9) 98%	(4.9) 98%	UC-96.0'				-No Joints, slightly weathered in biotite rich zones at 91.6 ft and 93.1 ft
211.3	96.4	5.0	2:07 2:18 3:00 2:30 2:40	(4.8) 96%	(3.9) 78%	8				(2 joints at 20° with Fe stain; 3 joints at 40° weathered)
206.3	101.4	5.0	1:42 1:35 2:04 2:04 2:12	(2.5) 50%	(0.8) 16%	9				206.3 — 101.4 Weathered Rock: Severely weathered, BIOTITE GNEISS (No recovery) 204.0 — 103.7 Hard Rock: Dark gray, moderately severe to slightly weathered, close fracturing, soft to moderately hard, BIOTITE GNEISS
201.3	106.4	5.0	1:48 2:20 2:36 3:04 3:40	(5.0) 100%	(5.0) 100%	10				201.3 — 106.4 Hard Rock: Light to dark gray, fresh, wide fracturing, hard, QUARTZ-BIOTITE GNEISS -No Joints
196.3	111.4	3.3	3:40 3:03 3:04 1:21/0.3	(3.2) 97%	(3.2) 97%	UC-112.7'				(1 joint at 30° slightly weathered)
193.0	114.7	0.6	4:54/0.7	(0.0) 0%	(0.0) 0%	12				193.0 — 114.7 192.4 — 115.3 Weathered Rock: Severely weathered, BIOTITE GNEISS (No recovery)
192.4	115.3	1.1	3:45/1.1			13				-No recovery
191.3	116.4	5.0	3:51 3:52 4:00 3:24 2:50	(1.1) 100% (5.0) 100%	(1.1) 100% (5.0) 100%	14				Hard Rock: Light to dark gray with pink, slightly weathered to fresh, close to wide fracturing, moderately hard to hard, QUARTZ-BIOTITE GNEISS with trace pyrite and magnetite (1 joint at 30° slightly weathered and Fe stained) -No Joints
186.3	121.4	5.0	3:01 2:34 2:49 3:25 2:25	(5.0) 100%	(5.0) 100%	15				(1 joint at 45° slightly weathered)
181.3	126.4	5.0	2:45 3:11 3:08 3:15 3:48	(5.0) 100%	(5.0) 100%	16				-No Joints
176.3	131.4	5.0	5:13 3:17 2:28 2:42 2:35	(5.0) 100%	(5.0) 100%	UCS-135.7'				(1 joint at 45° and 1 joint at 80° both slightly weathered; quartz vein with pyrite and chlorite at 131.8 ft)
171.3	136.4	5.0	2:56	(5.0)	(5.0)	18				-No Joints

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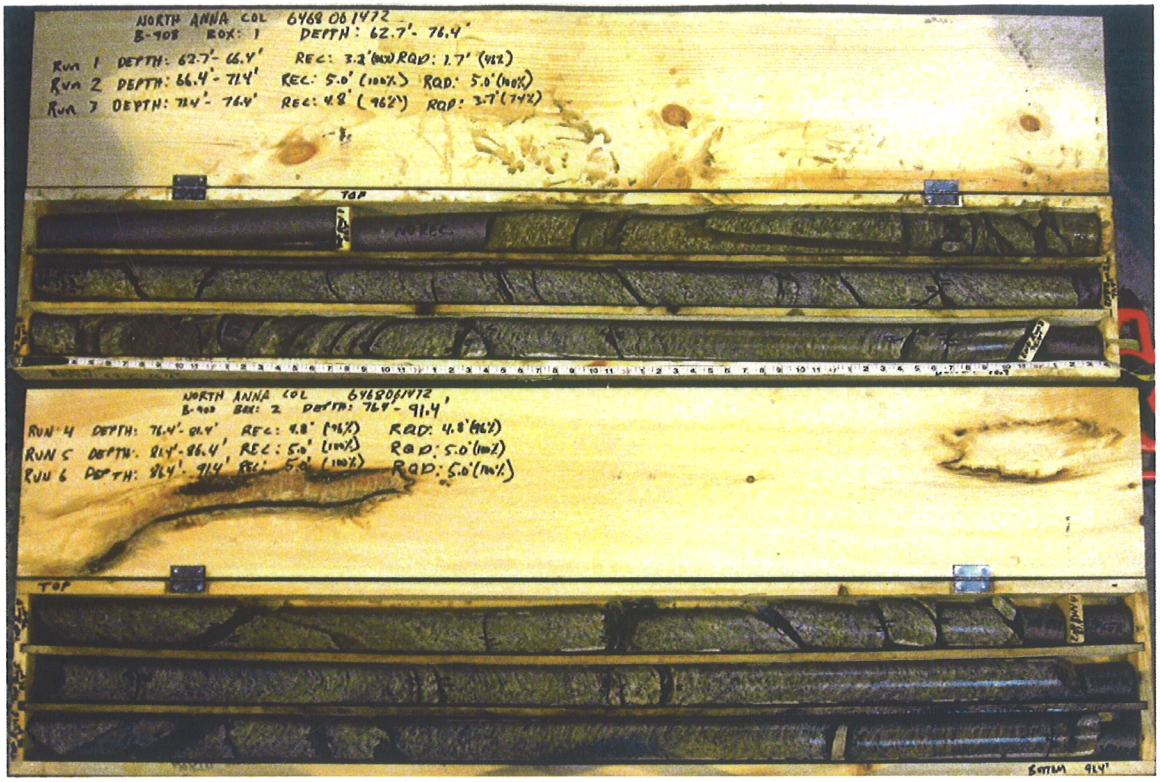
BORING NO. B-908	DRILL METHOD: Rotary Wash/Core	SAMPLE METHODS: SPT/CORE
COLLAR ELEV. 307.7 ft (NAVD88)	NORTHING 3,909,717 US ft (NAD83)	EASTING 11,686,061 US ft (NAD83)
TOTAL DEPTH 151.4 ft	DRILL MACHINE CME 55LC Track	DRILLER: F. Cox
DATE STARTED 9/13/06	COMPLETED 9/18/06	CORE BARREL TYPE: HQ 3 triple tube-wireline
CORE SIZE HQ3	TOTAL RUN 88.7 ft	

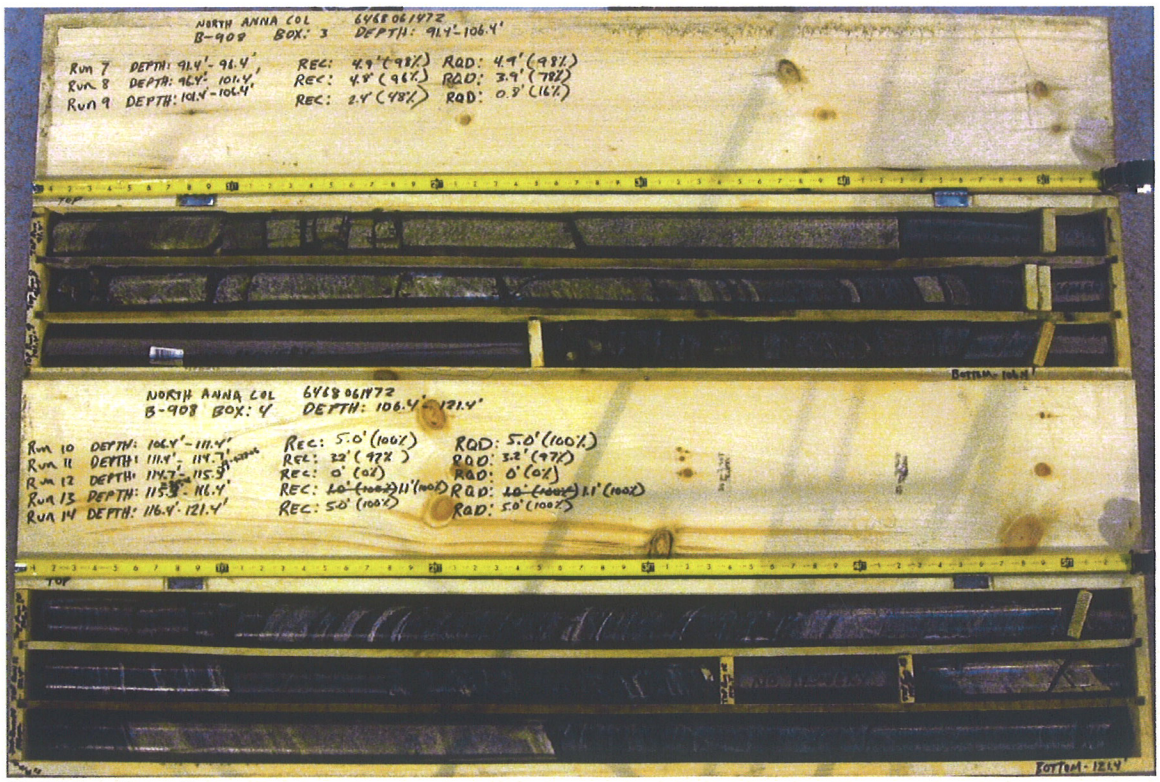
GROUND WATER (ft)	
0 HR.	16.0
24 HR.	17.1

HAMMER TYPE 140 lbs Auto

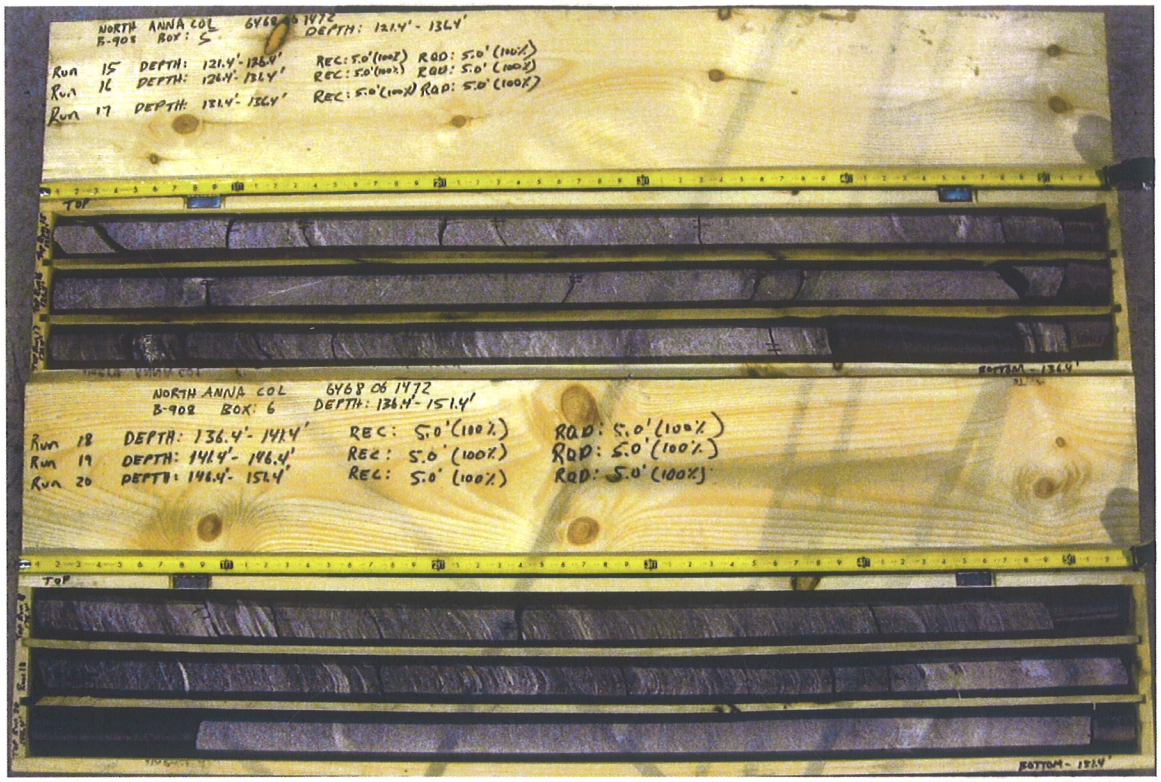
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Continued from previous page
			2:52 2:50 2:35 2:30	100%	100%					Hard Rock: Light to dark gray with pink, slightly weathered to fresh, close to wide fracturing, moderately hard to hard, QUARTZ-BIOTITE GNEISS with trace pyrite and magnetite *(continued)*
166.3	141.4									
		5.0	2:26 2:30 2:35 3:02 3:21	(5.0) 100%	(5.0) 100%	19				(1 joint at 25° slightly weathered)
161.3	146.4									
		5.0	3:39 4:12 3:45 3:44 3:38	(5.0) 100%	(5.0) 100%	UC-146.8'				-No Joints
156.3	151.4									156.3 151.4
										Coring terminated at 151.4 ft in Hard Rock: Hard, QUARTZ-BIOTITE GNEISS



B-908 – Box 1
B-908 – Box 2



B-908 – Box 3
B-908 – Box 4



B-908 – Box 5
B-908 – Box 6