

Table AII-10-2 LBKP EXPORTS FROM THE U.S.A. BY DESTINATION (1)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Canada	MT 18,915	29,384	24,669	21,134	39,886	23,393	10,573	21,646	17,453	12,829	13,178	24,513
	\$/T 120.9	95.7	264.6	312.8	381.9	390.6	310.3	356.4	400.8	438.3	394.0	361.8
Mexico	MT 8,955	15,032	19,341	15,333	8,812	4,355	7,135	8,429	24,085	6,859	13,322	11,721
	\$/T 146.6	183.7	381.6	394.0	382.8	252.4	302.9	379.9	370.5	448.5	385.2	369.4
Guatemala	MT 7,717	10,391	2,993	767	6,845	6,662	8,768	7,323	8,180	7,854	4,424	7,485
	\$/T 142.2	196.1	341.5	387.2	299.5	263.4	279.9	372.3	452.4	445.5	318.3	312.9
El Salvador	MT 1,540	145				1,357			599	4,075	4,735	5,890
	\$/T 139.0	137.9				322.8		216	545.9	420.4	403.0	374.2
Costa Rica	MT											
	\$/T											
Panama	MT 161									1,081		
	\$/T 198.8									333.0		
Jamaica	MT	423	132			321						
	\$/T	236.4	348.5			255.5						
Dominica	MT	746				269		612	511			
	\$/T	268.1				364.3		395.4	373.8			
Trinidad	MT	285										
	\$/T	151.2										
Tobago	MT	151.2										
	\$/T	3,093	1,968	1,681	1,662	861						
Colombia	MT	144.2	191.6	345.6	421.2	348.4						
	\$/T											
Venezuela	MT 27,825	20,816	27,585	19,493	26,976	39,905	38,781	24,270	35,129	27,354	34,073	33,580
	\$/T 147.9	184.7	301.0	395.1	333.0	334.5	283.3	347.7	439.5	396.8	386.2	365.5
Ecuador	MT											
	\$/T					1,021	1,535		635	2,246	1,166	167
Peru	MT 2,351	5,091	4,387	1,252		251.7	293.8	601	412.6	453.7	402.2	479.0
	\$/T 154.8	221.6	394.1	464.9		3,534	3,551	189	189	1,218	3,364	2,778
Chile	MT											
	\$/T					332.2	289.2	342.8	375.7	387.5	346.6	288.0
Brazil	MT 16,458	493	4,922	6,624	182			391				
	\$/T 142.7	346.9	474.8	362.6	423.1			255.8				
Uruguay	MT		103									
	\$/T		436.9									
Surinam	MT											
	\$/T											
Argentina	MT 3,405	6,069	4,423	13,341	2,391	1,975				5,922		
	\$/T 147.1	185.0	301.8	382.2	366.8	283.0				407.6		
Sweden	MT 2,094	2,591		5,430		1,143			3,141	600		267
	\$/T 139.0	135.5		479.6		337.7			549.2	450.0		352.1
Norway	MT			2,446	1,078	1,151						
	\$/T			278.4	369.2	341.4						

Table AII-10-2 LBXP EXPORTS FROM THE U.S.A. BY DESTINATION (2)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Finland	MT	85	344	173		2,908				503		
	\$/T	223.5	171.5	167.6		295.4				522.9		
U.K.	MT	74,469	71,518	103,330	86,166	61,333	110,552	95,083	75,988	93,165	106,613	108,140
	\$/T	170.2	172.9	268.8	371.4	342.4	371.4	392.1	476.4	485.0	440.8	364.7
Ireland	MT	207					1,033	1,066	2,069	4,161		
	\$/T	144.9					287.5	363.0	479.5	490.0		
Nether-lands	MT	30,455	29,743	41,945	41,929	29,505	25,608	27,639	28,797	48,585	45,605	63,077
	\$/T	163.7	166.8	285.9	387.8	333.8	369.7	311.9	386.1	453.9	414.3	367.3
Belux	MT	16,742	33,355	32,002	33,212	25,824	17,867	16,910	24,242	31,308	17,638	24,402
	\$/T	165.7	163.3	249.3	337.7	341.0	372.1	383.1	461.3	454.9	406.3	347.2
France	MT	19,984	14,114	32,845	31,255	37,440	25,405	37,682	43,895	27,379	39,395	20,674
	\$/T	160.8	168.8	291.2	364.9	333.9	292.3	368.6	442.0	445.7	401.5	369.4
W.Germany	MT	32,451	34,111	42,538	54,380	55,359	40,597	50,748	68,279	66,578	70,521	100,916
	\$/T	161.0	163.2	284.3	381.4	335.4	362.2	292.9	458.8	474.9	440.7	355.7
Italy	MT	58,150	63,299	87,697	79,308	79,499	65,112	74,430	54,196	86,922	67,205	58,626
	\$/T	155.1	160.0	286.6	377.1	371.5	362.6	308.9	455.3	438.7	408.5	355.0
Greece	MT		2,905	6,957	4,734	2,240	3,745	2,107	7,784	15,629	12,104	1,606
	\$/T		149.1	260.3	361.0	446.0	322.0	233.9	458.0	412.5	382.3	338.7
Indonesia	MT		542				5,556	9,840	14,364	23,279	41,919	46,755
	\$/T		308.1				326.3	243.6	500.2	346.0	329.7	336.4
China	MT								15,220	4,024		
	\$/T								434.0	425.4		
S.Korea	MT	2,192	1,415	20,875	21,390	18,004	4,469	25,501	39,132	35,800	43,016	103,675
	\$/T	142.8	250.9	241.5	309.4	336.8	312.2	403.4	465.5	434.8	365.4	339.3
Japan	MT	8,239	23,496	90,458	61,980	40,355	34,554	47,461	163,624	111,890	109,636	151,732
	\$/T	144.7	195.9	337.0	405.6	434.1	405.5	347.3	418.5	489.6	414.9	369.6
S.Africa	MT	9,091	14,331	18,355	10,334	18,332	17,711	16,437	17,176	11,665	9,907	12,114
	\$/T	128.7	235.6	371.1	422.0	346.2	327.6	361.8	437.6	436.9	404.9	352.9
Other Countries	MT	64,780	63,682	65,814	79,579	46,906	41,841	29,094	49,029	69,125	57,914	51,893
	\$/T	161.5	197.1	319.9	374.9	359.6	325.3	298.7	463.9	406.7	381.7	333.1
Total	MT	409,565	445,954	633,225	591,746	525,258	423,785	487,934	694,096	700,054	695,736	832,229
	\$/T	156.6	173.4	298.6	375.0	356.7	351.8	303.3	455.6	449.3	404.8	355.8

Sources: U.S. Exports, 1972-1983

Table AII-10-3 NBKP EXPORTS FROM CANADA BY DESTINATION (1)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
U.K.	MT 220,916	222,913	241,537	196,235	249,863	236,496	209,909	230,135	231,776	167,304	179,273	170,725
	\$/T 137.2	160.8	244.0	324.3	320.4	300.5	282.3	335.4	408.7	487.3	431.5	357.0
Ireland	MT 7,355	10,835	6,835	3,239	7,219	2,814			29	635	1,163	463
	\$/T 134.2	145.7	229.8	348.3	464.6	329.8			620.7	576.4	622.5	585.3
Belux	MT 141,579	132,850	173,465	133,944	198,699	194,676	134,173	168,925	177,882	93,636	77,569	119,306
	\$/T 138.5	172.5	281.3	348.5	351.9	316.3	269.3	350.3	434.4	49.9	439.9	355.0
Denmark	MT 5,651	4,413	2,511	2,162	3,972	3,141	4,957	6,137	3,791	6,598	5,491	3,820
	\$/T 131.8	152.3	234.6	303.0	316.2	244.5	220.5	312.7	414.4	471.1	415.6	356.1
Finland	MT				1,857	1						
	\$/T				330.6	1000.0						
France	MT 145,283	154,824	192,840	166,815	180,712	150,274	240,614	288,686	328,393	271,149	236,556	231,560
	\$/T 134.8	153.4	249.1	327.3	327.2	304.8	250.0	329.6	397.5	476.3	423.7	350.4
W. Germany	MT 210,698	266,358	272,712	206,625	249,813	265,374	320,283	291,765	350,713	283,192	345,324	362,801
	\$/T 133.1	152.2	236.4	314.5	317.5	286.1	233.0	324.5	404.8	493.8	415.4	342.0
Greece	MT 5,814	2,140	2,740		8,918	10,116	54,125	40,132	69,489	15,203	24,807	23,562
	\$/T 135.5	131.8	309.1		248.7	298.6	244.8	366.5	447.2	495.7	441.3	333.5
Italy	MT 167,065	221,805	225,214	281,409	293,195	244,590	308,683	336,244	349,496	305,495	246,285	227,383
	\$/T 138.6	167.2	258.4	207.0	327.7	302.7	233.3	326.5	391.7	479.8	411.5	335.0
Nether-lands	MT 117,403	92,727	141,107	128,163	125,220	155,167	132,582	133,583	135,532	101,685	102,189	115,209
	\$/T 130.2	144.0	224.0	321.5	336.5	286.1	239.9	331.7	406.9	479.6	418.9	358.8
Sweden	MT 1,833	1,655	1,655		2	500	15		174	506	179	512
	\$/T 129.3	178.2	178.2		500.0	244.0	200.0		396.6	438.7	575.4	339.8
S. Africa	MT 3,659	8,842	4,870	6,646	19,628	18,633	39,047	21,401	20,653	34,478	17,938	48,943
	\$/T 112.1	131.3	368.0	295.2	293.5	261.4	237.2	314.4	351.4	498.0	443.0	328.2
China	MT 14,425	7,716	12,611	29,618	85,168	40,998	60,041	88,755	134,974	120,345	146,048	273,654
	\$/T 129.7	145.7	252.8	284.4	253.7	210.0	197.0	287.7	396.0	470.4	394.9	325.7
Indonesia	MT 1,015	228	1,528	1,958	2,713	4,009	20,144	10,931	10,837			
	\$/T 122.2	109.6	178.0	279.4	304.1	250.4	239.2	331.0	440.8			
Japan	MT 329,623	480,021	544,768	324,040	379,306	337,531	552,965	703,555	748,730	532,485	511,957	544,350
	\$/T 143.4	166.7	246.7	326.5	324.8	293.1	249.6	337.6	405.2	498.8	446.6	362.2
S. Korea	MT 24,112	34,931	39,493	6,515	29,209	48,203	93,238	79,007	62,145	50,463	37,921	61,862
	\$/T 128.4	163.7	260.0	292.9	266.3	260.8	245.2	341.6	398.0	512.9	345.4	321.9
Guyana	MT					12			4	6		
	\$/T					500.0			750.0	666.7		
Argentina	MT 19417	16244	15504	10119	7507	11165	7857	6968	10894	5154	3399	3899
	\$/T 130.8	165.3	234.8	369.5	340.3	314.0	249.5	340.8	420.9	485.6	433.7	367.0
Brazil	MT 8273	6015	6947	4684	1931	103				166		
	\$/T 133.2	129.8	340.7	206.7	199.9	271.8				584.3		
Chile	MT					112						
	\$/T					178.5						

Table AII-10-3 NBKP EXPORTS FROM CANADA BY DESTINATION (2)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Colombia	MT	3482	4684	2963	2538	113	2238	3914	7399	4472	2641	3278
	\$/T	128.1	123.4	203.2	258.9	309.7	237.3	330.6	404.2	464.9	472.5	340.5
Ecuador	MT											296
	\$/T											371.6
Peru	MT	5554	4374	1911		4222	5060	1225	2491	619		
	\$/T	118.8	156.6	263.2		253.7	204.5	293.9	423.1	479.8		
Surinam	MT											595
	\$/T											294.1
Uruguay	MT	113										
	\$/T	141.6										
Venezuela	MT	20382	24728	25183	13103	17897	36244	23766	15974	15557	22428	31101
	\$/T	131.1	139.4	231.2	336.7	283.7	261.3	343.3	423.4	502.1	361.8	336.8
Bermuda	MT					23						
	\$/T					304.3						
Jamaica	MT					766	3849	33		45		
	\$/T					267.6	245.5	515.2		777.8		
Costa Rica	MT							550			1646	1101
	\$/T							427.3			314.1	349.7
Cuba	MT	2233	3661	7421	200	10552	990	1647	5704			
	\$/T	130.8	137.9	197.8	680.0	334.0	317.2	412.9	448.8			
Dominica	MT				587			1108				
	\$/T				228.3			416.1				
El Salva-	MT	1060	1086	653		231	1199	784	1146	20		477
dor	\$/T	115.1	114.2	215.9		281.4	221.9	348.2	526.2	450.0		291.4
Guatemala	MT	560	859			62	100	222				3145
	\$/T	128.6	210.7			274.2	320.0	319.8				265.2
Mexico	MT	2733	6043	7288	1677	1885	918	23343	21645	8846		19299
	\$/T	132.1	188.6	282.4	317.2	331.2	234.7	401.6	455.6	378.5		314.7
Neth.	MT										57	25
Antilles	\$/T										1070.2	560.0
Panama	MT	182	397	1221		1764						
	\$/T	115.4	113.4	588.9		190.5						
U.S.A.	MT	2063415	2374770	2521021	2089950	2481085	2526985	2941136	2810976	2400148	2209160	2455113
	\$/T	139.6	172.3	274.5	343.2	337.1	309.6	347.4	417.8	495.9	452.0	382.8
Other	MT	112938	158043	167636	36271	227363	217522	163740	206729	186162	204554	278263
	\$/T	131.0	151.2	274.6	1205.2	296.8	313.1	332.0	403.8	697.0	396.8	328.4
Total	MT	3634940	4243340	4621634	3646372	4582073	4520104	5532414	5705217	4622872	4385431	4980742
	\$/T	138.2	166.7	263.8	334.9	329.3	303.3	340.5	411.4	491.5	436.7	363.4

Sources: Foreign Trade Statistics of Canada, 1972-1983

Table AII-10-4 LBXP EXPORTS FROM CANADA BY DESTINATION (1)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
U.K.	MT 95,675	55,777	78,112	77,468	73,623	76,786	76,711	56,144	44,132	42,964	35,470	32,308
	\$/T 121.7	141.5	244.1	324.8	324.6	287.4	218.4	288.7	347.1	452.7	378.1	343.1
Ireland	MT 1,427	780	477	282						287		
	\$/T 151.4	169.2	203.4	290.8						648.1		
Belux	MT 6,637	10,695	1,847	4,327	4,405	17,230	6,855	1,791	5,390	5,592	1,947	2,292
	\$/T 112.9	137.5	180.3	312.5	225.2	262.6	213.4	306.0	362.7	464.4	449.4	359.9
Finland	MT 1,690	1,231	22,889	14,949	315.8	298.2						
	\$/T 130.8	142.2	251.8	309.2	267.7	258.3	8,716	19,328	19,782	24,927	19,192	16,059
France	MT 55,839	44,444	56,808	39,788	38,509	46,915	37,451	46,540	59,113	50,980	52,671	59,014
	\$/T 118.7	137.9	230.4	315.8	320.5	278.7	212.6	278.5	348.3	454.4	388.8	339.5
Greece	MT 1,300	779				552				1,944		
	\$/T 119.2	308.1				317.0				393.7		
Italy	MT 28,633	29,322	24,042	8,609	13,328	7,507	3,566	9,197	10,503	6,080	3,248	4,869
	\$/T 134.0	141.0	225.5	314.1	293.9	240.0	244.3	349.1	427.5	518.3	472.6	278.5
Nether-	MT 4,089	4,662	701	1,204	16,189	24,280	41,111	37,626	46,237	36,614	28,244	29,180
lands	\$/T 120.1	136.2	249.6	272.4	344.1	273.1	209.3	282.8	352.0	435.5	360.5	335.5
Norway	MT 118.7											
	\$/T 118.7											
Sweden	MT 6,272	118.9			2	722	4,616	1,980			91	
	\$/T 118.9	118.9			500.0	239.6	193.7	259.6			329.7	
S. Africa	MT 9,439	2,645	462	21		9,294	9,270	10,254	12,700	8,144	4,829	5,118
	\$/T 135.2	221.6	344.2	333.3		243.3	238.6	327.5	398.6	470.9	373.0	321.6
China	MT 5,729	231.8	41,743	71,660	65,741	38,116	16,556	54,594	84,130	70,789	77,144	90,182
	\$/T 231.8	208.6	208.6	303.8	312.1	271.1	191.0	248.0	338.0	438.9	360.6	322.5
Indonesia	MT 5,564	164.5	581	1,299	937	1,211	5,155		4,111	6,066		
	\$/T 164.5	164.5	352.8	195.5	203.8	254.3	237.2		402.8	393.5		
Argentina	MT 6,604	144.5	375.0	560	1,123							
	\$/T 144.5	144.5	375.0	360.7	331.3							
Brazil	MT 126.1	126.1										
	\$/T 126.1	126.1										
Peru	MT 8,835	150.7	7,298	4,523	4,398	1,917			10,898	5,159		
	\$/T 118.8	150.7	223.3	224.2	304.0	219.6			376.9	440.4		
Venezuela	MT 118.8	150.7	223.3	224.2	304.0	219.6						
	\$/T 118.8	150.7	223.3	224.2	304.0	219.6						

Table AII-10-4 LBKP EXPORTS FROM CANADA BY DESTINATION (2)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Costa Rica MT									1,444			
\$/T									385.0			
Cuba	384		335									
MT	125.0		256.7									
\$/T												
Guatemala		1,891			4,994							
MT		231.1			299.4							
\$/T												
Mexico	2,626	1,301	1,423						5,410	1,695		
MT	124.5	178.6	491.9						371.2	388.8		
\$/T												
U.S.A.	229,079	236,381	171,406	81,183	112,804	141,192	171,356	141,600	149,148	159,958	135,339	235,381
MT	123.7	159.8	285.1	341.7	318.2	266.8	250.9	413.8	427.8	496.6	458.3	395.8
\$/T												
Other	4,106	2,176	15,732	13,616	11,867	5,102	8,836	1,039	4,692	4,711	511	2,733
MT	133.2	183.4	266.6	312.9	278.5	233.8	213.1	285.9	368.5	400.1	540.1	298.6
\$/T												
Countries	465,789	429,817	424,859	319,489	384,082	381,936	392,250	381,746	458,021	429,495	358,686	477,086
MT	123.5	153.7	256.1	319.5	311.2	271.0	230.6	330.4	378.9	463.6	407.5	361.8
\$/T												

Sources: Foreign Trade Statistics of Canada, 1974-1983

Table AII-10-5 BRP EXPORTS FROM BRAZIL BY DESTINATION (1)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
W. Germany	MT	410	100	30	100		185	21,800	32,516	38,920	32,540	64,700
	\$/T	297.6	330.0	366.7	280.0		210.8	390.2	468.4	479.9	414.6	331.6
France	MT			3,000	8,024		3,170				3,650	1,550
	\$/T			302.0	298.0		209.8				356.7	319.4
Italy	MT					50	50	5,902	36,780	25,050	23,145	1,300
	\$/T					300.0	200.0	432.4	440.3	448.3	272.2	330.8
Netherlands	MT						8,083	25,826	30,044	23,852	7,462	8,250
	\$/T						245.1	352.6	451.5	436.0	346.4	329.7
Belux	MT			240	101		18,349	92,008	213,985	244,962	230,814	325,721
	\$/T			345.8	306.9		273.3	364.3	444.3	451.8	344.4	323.6
U.K.	MT				280		1,264	31,878	36,556	46,640	52,450	21,700
	\$/T				321.4		250.0	361.3	465.0	477.6	395.2	333.1
Norway	MT				425					160		
	\$/T				298.8					250.0		
Sweden	MT										250	300
	\$/T										376.0	313.3
Austria	MT						48					
	\$/T						208.3					
Yugoslavia	MT					200						
	\$/T					300.0						
Argentina	MT	5,875	13,117	3,411	3,450	5,744	16,914	29,601	38,284	37,824	46,906	23,513
	\$/T	188.1	213.3	335.1	448.7	410.4	275.5	415.2	511.4	427.3	338.0	342.1
Bolivia	MT											
	\$/T										525.3	
Chile	MT						300		15	69	250	215
	\$/T						256.7		426.7	565.2	384.0	390.7
Colombia	MT					200	1,030	4,574	4,416	9,102	10,444	13,416
	\$/T					310.0	254.4	382.4	463.3	471.1	401.8	345.5
Ecuador	MT						100	1,000				1,077
	\$/T						260.0	408.0				348.2
Guatemala	MT						1,700	1,000				400
	\$/T						257.6	305.0				350.0
Mexico	MT			100		33			2,050	673		3,329
	\$/T			310.0		333.3		391.2	429.3	425.0		338.8
Panama	MT								495			600
	\$/T								470.7			300.0
Peru	MT						1,200	2,000	2,990	1,169		400
	\$/T						245.7	367.5	467.9	440.5		340.0
Uruguay	MT		50			125	1,610	2,263	1,976	1,127	678	976
	\$/T		186.0			320.0	306.2	427.3	470.6	559.9	429.2	341.2
Venezuela	MT						4,682	14,267	11,014	16,582	19,800	18,317
	\$/T						257.4	345.3	464.8	433.5	321.8	333.7

Table AII-10-5 BXP EXPORTS FROM BRAZIL BY DESTINATION (2)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
U.S.A.	MT											
	\$/T											
Canada	MT			203		949	11,032	45,131	100,683	104,709	132,315	149,788
	\$/T			325.1	308.7		229.0	337.8	434.9	416.8	374.7	340.7
Angola	MT							950		51		
	\$/T							368.2		392.2		
Algeria	MT						2,000	4,000				
	\$/T						261.5	365.5				
Nigeria	MT			999			3,000		500	572	1,408	1,998
	\$/T			305.3			281.7		446.0	367.1	356.5	416.4
S. Africa	MT					250			9,551	13,989	10,200	31,798
	\$/T					284.0			458.0	406.6	342.7	335.2
Tunisia	MT								2,000			
	\$/T								420.0			
Australia	MT								2,249	2,080	1,520	15
	\$/T								467.3	424.5	327.6	373.3
China	MT							5,000	13,500	14,498	22,189	
	\$/T							327.0	434.1	276.5	288.2	
Taiwan	MT	21						11,350		3,080	1,550	7,100
	\$/T	142.9						341.1		326.3	285.8	307.3
S. Korea	MT						9,000	13,789	11,500	12,848	4,600	14,992
	\$/T						247.8	347.5	414.2	353.8	291.1	296.2
Philippine	MT										356	100
	\$/T										286.5	350.0
India	MT											3,093
	\$/T											300.4
Indonesia	MT						2,055	5,649	4,000	14,536	9,147	19,820
	\$/T						245.3	349.6	528.8	356.2	265.1	232.3
Iraq	MT							3,000	6,960			
	\$/T							403.0	487.8			
Israel	MT				203							
	\$/T				295.6							
Japan	MT		30			11,436	42,243	109,116	203,773	164,848	181,434	181,043
	\$/T		466.7			306.4	255.1	316.9	423.7	404.8	359.8	319.6
Thailand	MT						5,281	12,183				
	\$/T						280.1	351.2				
Total	MT	5,875	13,598	3,541	6,820	11,621	133,297	445,755	765,836	762,842	788,516	932,531
	\$/T	188.1	215.6	335.8	378.0	311.2	257.9	353.0	443.9	433.0	354.6	325.1

Sources: Foreign Trade Statistics of Brazil, 1972-1983

Annex II-11

LBKP/NBKP IMPORTS BY ORIGIN

Table AII-11-1 LBKP IMPORTS TO BELUX BY ORIGIN

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Brazil												
MT					102	48	1,867	16,063	9,117	3,683	23,308	30,849
\$/T				411.8	437.5	48	346.5	401.2	445.5	480.9	389.4	344.8
Canada												
MT	564	680	672	16,614	1,924	4,773	8,945	21,608	14,487	23,183	11,549	2,094
\$/T	241.1	227.9	410.7	335.1	385.7	332.9	321.1	399.3	455.7	476.8	449.7	347.2
Chile												
MT											1,112	
\$/T											394.8	
W.Germany												
MT	2,761	3,919	2,135	807	853	1,031	1,283	1,332	1,249	1,325	1,359	1,433
\$/T	199.6	226.6	506.8	718.7	892.1	999.8	1067.8	1101.4	1140.1	901.1	952.2	263.1
Denmark												
MT		611	704									
\$/T		85.1	132.1									
Finland												
MT	770	393	1,706	788	920	421	843	381	363	1,108	745	1,512
\$/T	258.4	254.5	409.1	444.2	423.9	396.7	329.8	419.9	454.5	447.7	410.7	369.0
France												
MT		11	70	21	45	71		558	200	157	672	9,086
\$/T		181.8	600.0	809.5	266.7	422.5		301.1	430.0	388.5	361.6	310.1
Italy												
MT												103
\$/T												388.3
Netherlands												
MT		280		351	2,286	241	365	1,570	165	291		256
\$/T		175.0		347.6	399.8	477.2	504.1	500.0	381.8	436.4		273.4
Norway												
MT	100	4,038	762	400	1,384	2,283	3,493	3,450	3,243	2,752	2,818	538
\$/T	170.0	188.7	370.1	435.0	442.2	434.1	427.1	372.2	379.0	296.1	296.1	334.6
Sweden												
MT	77	700	648	4,628	5,535	3,995	6,062	2,537	3,107	2,382	3,989	2,351
\$/T	168.8	195.7	316.4	403.8	448.6	397.7	335.4	426.9	434.8	479.0	413.4	346.0
U.S.A.												
MT	4,360	3,963	6,432	17,266	17,379	9,558	7,606	12,677	21,545	20,799	23,098	14,735
\$/T	227.1	237.4	385.7	362.4	437.7	452.0	442.5	447.2	444.0	460.1	409.5	354.3

Sources: NIMEX, 1972-1983

Table AII-11-2 NBKP IMPORTS TO BELUX BY ORIGIN

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Argentina	MT											13
	\$/T											230.8
Brazil	MT				485			749	77	1,763	1,094	1,716
	\$/T				321.6			419.2	506.5	473.6	460.7	296.6
Canada	MT	12,929	6,533	3,758	23,643	29,868	40,383	36,883	35,054	46,007	75,557	83,701
	\$/T	168.8	174.0	334.2	366.9	413.3	401.8	407.8	445.2	495.2	462.6	359.9
Chile	MT										1,779	5,445
	\$/T										385.0	323.4
W.Germany	MT	483	90	67	63	426	249	306	419	150	1,695	341
	\$/T	167.7	266.7	403.0	666.7	666.7	799.2	679.7	615.8	653.3	473.7	395.9
Finland	MT	4,713	3,603	2,920	11,826	14,188	10,382	11,893	12,103	13,670	12,373	8,027
	\$/T	154.5	167.9	300.3	363.9	426.4	398.4	439.6	480.2	519.7	488.9	395.4
France	MT	42	451		26	32	9	500	46	43	1,372	596
	\$/T	166.7	210.6		269.2	406.3	777.8	468.0	521.7	558.1	416.2	332.2
U.K.	MT											188
	\$/T											414.9
Nether-	MT		230		5,653	164	675	4,054	2,397	3,978	3,779	2,402
lands	\$/T		182.6		363.3	445.1	503.7	449.2	445.1	496.7	464.7	376.4
Norway	MT	17,711	14,741	13,717		2,604	2,500	2,690	1,177	726	764	3,206
	\$/T	206.9	225.9	424.4		386.3	358.0	407.8	480.9	315.4	374.3	339.7
Peru	MT				40							
	\$/T				400.0							
Sweden	MT	24,452	24,775	19,439	55,145	60,592	44,495	52,325	41,314	41,613	37,198	58,748
	\$/T	181.0	194.8	324.0	396.4	424.3	411.3	439.5	470.2	515.6	473.7	376.2
U.S.A.	MT	18,532	15,234	11,738	40,668	23,582	26,853	26,651	39,851	44,398	46,771	46,470
	\$/T	222.5	215.6	379.4	340.0	428.4	418.2	441.1	454.4	503.2	463.3	361.1

Sources: NIMEX, 1972-1983

Table AII-11-3 LBKP IMPORTS TO WEST GERMANY BY ORIGIN

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Argentina												
MT												1,637
\$/T												414.2
Belux												
MT			14,079	24,946	22,799	25,836	23,267	26,287	20,567	24,687	20,567	24,229
\$/T			397.8	405.0	388.3	334.5	421.4	445.9	483.7	483.7	429.6	334.7
Bermuda												
MT								1,680	3,232			
\$/T								402.4	418.3			
Brazil												
MT			1,393	17,129	39,768	48,662	83,749	110,298	127,392	127,392	125,829	
\$/T			404.2	380.5	322.3	425.4	454.9	508.0	443.7	508.0	443.7	359.1
Canada												
MT			49,381	46,034	55,379	47,373	59,193	69,238	61,751	66,883	68,350	68,350
\$/T			341.6	392.1	364.9	308.0	388.9	415.5	465.2	427.9	427.9	334.1
Chile												
MT			1,754	137	2,508	305						2,818
\$/T			375.7	350.4	386.0	459.0						350.6
Denmark												
MT		128	338									176
\$/T		93.8	210.1									227.3
Finland												
MT		121	59	86,821	109,797	154,622	164,649	216,816	214,170	200,945	194,316	214,304
\$/T		181.8	229.5	322.0	383.5	427.6	334.0	410.9	450.0	505.2	456.4	357.8
France												
MT		1,680	1,892	2,665	70	3,805	7,518	10,491	8,298	3,920	5,651	7,020
\$/T		164.9	197.1	493.8	400.0	401.6	375.2	335.5	437.0	458.9	456.4	451.3
U.K.												
MT								600	2,113			509
\$/T								373.3	389.5			282.9
Italy												
MT										208		
\$/T										461.5		
Nether-lands												
MT				20	23	100	649	5,917	4,603	1,102	387	201
\$/T				200.0	304.3	260.0	201.8	425.9	441.2	386.6	485.8	328.4
Norway												
MT		488	106	315	16,494	15,919	28,709	27,030	13,828	10,017	5,909	10,207
\$/T		213.1	217.0	330.2	391.6	417.9	369.5	331.6	447.5	486.9	446.6	323.2
Panama												
MT											421	8
\$/T											410.9	375.0
Sweden												
MT		2,360	2,717	5,730	124,838	149,809	141,391	144,165	145,513	109,566	99,767	85,101
\$/T		195.8	215.3	339.3	401.3	427.8	419.6	349.1	429.5	453.5	511.0	464.3
U.S.A.												
MT		1,012	1,558	2,193	53,326	49,090	44,900	50,908	62,294	72,229	66,386	64,621
\$/T		201.6	200.9	405.8	357.9	413.1	418.2	331.9	393.4	412.9	473.2	412.1

Sources: NIMEX, 1972-1983

Table AII-11-4 NBKP IMPORTS TO WEST GERMANY BY ORIGIN

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Argentina												
MT						476	1,511	4,897	7,337	6,430	5,666	1,373
\$/T						418.1	346.1	440.1	464.1	524.3	422.5	372.9
Brazil												
MT		24		379	736	1,959	2,686	3,476	6,304	3,039	2,572	1,105
\$/T	69.8	250.0		379.9	466.0	412.5	334.3	425.5	448.9	521.6	465.0	378.3
Belux												
MT	2,543	1,501	7,649	324,792	388,293	397,665	430,263	414,039	497,096	471,765	491,037	572,588
\$/T	182.5	243.2	367.2	335.8	402.6	413.3	336.2	398.6	437.8	501.5	481.7	368.9
Canada												
MT					14,817	16,697	29,810	33,302	25,276	34,002	34,826	45,813
\$/T					375.3	378.6	321.4	408.8	451.4	514.7	473.0	367.9
Chile												
MT												
\$/T												
Denmark												
MT		80										
\$/T		112.5										
Finland												
MT	2,050	2,842	10,342	23,270	37,748	50,940	56,425	87,742	108,056	96,630	84,597	91,196
\$/T	208.8	231.5	372.5	382.9	425.7	421.3	361.7	440.2	463.4	519.2	486.3	386.0
France												
MT	24,132	28,409	25,025	942	1,611	3,028	5,127	4,056	3,252	1,647	7,143	1,925
\$/T	164.9	201.3	331.4	384.3	385.5	348.4	349.9	387.8	417.6	432.3	512.0	404.2
U.K.												
MT	380	929				688			1,433			
\$/T	89.5					104.7			270.8			
Nether-lands												
MT		96		136	2,988	965	199	6,389	3,901	304	322	2,218
\$/T		281.3		352.9	502.3	414.5	311.6	431.8	418.6	648.0	447.2	389.1
Norway												
MT	21,345	26,196	32,676	876	3,720	5,786	6,074	11,437	4,921	19,335	23,365	21,061
\$/T	187.8	218.9	337.0	436.1	316.7	381.8	308.0	434.6	443.8	529.0	490.6	391.4
Panama												
MT												
\$/T												
Sweden												
MT	72,403	68,565	77,047	317,982	378,931	317,418	372,183	362,750	353,846	375,441	346,748	373,118
\$/T	184.9	208.9	340.1	412.3	439.2	442.9	382.0	461.5	498.8	553.1	524.3	393.4
U.S.A.												
MT	5,908	9,876	15,139	116,085	136,800	142,813	170,550	194,203	254,752	268,560	291,415	342,876
\$/T	215.3	204.5	373.6	361.9	438.2	453.6	387.8	454.9	486.1	565.3	527.8	412.9

Sources: NIMEX, 1972-1983

Table AII-11-5 LBKP IMPORTS TO FRANCE BY ORIGIN

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Belux	MT 2,494	1,378	26,193	42,074	57,367	55,748	53,472	47,002	54,023	67,018	56,602	
	\$/T 99.4	106.0	406.0	325.2	331.5	340.5	429.0	449.9	425.3	386.4	322.5	
Brazil	MT 2,113	4,226	25,127	311.9	68,254	470.2	420.3	327.6				
	\$/T 350.2	334.8	311.9	426.6	462.1	470.2	420.3	327.6				
Canada	MT 28,153	8,281	17,062	24,639	16,889	28,145	21,848	12,930				
	\$/T 160.0	339.5	331.4	306.2	437.8	427.7	385.5	319.6				
Chile	MT 3,015	240	9,381									
	\$/T 338.3	354.2	354.2									
W.Germany	MT 11,111	20,329	2,240	536	170	360	4,614	4,336				
	\$/T 194.8	214.0	293.2	350.7	435.3	436.1	379.3	287.8				
Finland	MT 467	683	971	13,956	6,111	9,206	37,165	66,635	61,008	45,993	35,718	45,807
	\$/T 169.2	164.0	261.6	374.2	382.9	393.7	329.2	391.0	394.7	436.2	428.4	335.8
U.K.	MT 442											
	\$/T 79.2											
Italy	MT 572											
	\$/T 302.4											
Nether-lands	MT 1,392											
	\$/T 557											
Norway	MT 698	468	135	1,982	790	4,309	7,652	1,023	343	174	2,249	1,763
	\$/T 235.0	222.2	333.3	472.8	364.6	344.2	313.4	433.0	489.8	477.0	378.4	342.0
Panama	MT 14											
	\$/T 500.0											
Sweden	MT 773	257	3,572	43,717	50,241	58,199	77,211	69,840	48,682	63,389	28,068	40,179
	\$/T 174.6	202.3	339.3	413.0	381.8	374.1	340.6	430.5	470.3	473.7	430.2	333.1
U.S.A.	MT 3,644	2,406	1,696	27,123	35,821	24,568	30,442	40,230	50,482	34,483	38,473	26,352
	\$/T 219.0	221.1	381.5	366.0	344.3	344.4	300.8	388.2	428.2	433.7	395.0	317.9

Sources: NIMEX, 1972-1983

Table AII-11-6 NBKP IMPORTS TO FRANCE BY ORIGIN

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Argentina	MT											972
	\$/T											373.5
Belux	MT	435	745	3	287	564	426	1,705	458	135	3,555	1,592
	\$/T	101.1	130.2	333.3	362.4	388.3	363.8	376.0	491.3	614.8	439.4	322.9
Brazil	MT					825		4,572	8,480	5,021	8,558	9,866
	\$/T					396.4		419.7	459.0	467.4	424.6	314.5
Canada	MT	4,203	4,373	8,815	192,624	212,287	348,624	320,630	343,762	344,078	295,172	282,132
	\$/T	187.2	219.5	490.4	360.4	370.4	324.1	405.8	454.0	478.7	452.3	346.3
Chile	MT				31,239	27,232	38,752	43,266	38,727	34,717	52,239	55,671
	\$/T				350.4	370.6	322.7	395.6	460.0	471.3	424.5	324.7
W. Germany	MT	12,908	23,068	20,329	27	298	158	590	1,120	1,120	1,025	1,531
	\$/T	162.8	180.5	313.5	407.4	369.1	392.4	567.8	552.7	553.6	536.6	363.2
Finland	MT	22,806	17,428	17,210	7,667	8,784	50,570	73,233	78,786	67,102	63,955	63,372
	\$/T	181.4	182.3	276.2	379.3	377.7	358.2	426.5	456.8	479.8	463.3	354.2
U.K.	MT				500				276			
	\$/T				186.0				547.1			
Nether-lands	MT		47		24	2	28	1,024	1,425	1,559	1,349	2,020
	\$/T		191.5		458.3	500.0	571.4	482.4	486.3	507.4	443.3	367.8
Norway	MT	12,096	15,264	13,595	6,068	3,740	648	588		6,257	10,896	19,661
	\$/T	175.4	204.8	407.4	423.0	394.0	290.1	459.2		514.1	461.7	367.9
Panama	MT											
	\$/T											
Sweden	MT	85,112	94,177	105,257	200,957	224,371	213,635	242,642	215,023	251,887	229,703	242,898
	\$/T	184.0	199.4	339.9	426.6	397.5	408.7	462.9	511.5	522.3	484.1	378.4
U.S.A.	MT	9,103	9,938	8,505	95,095	124,869	118,697	129,677	188,780	194,915	190,135	199,245
	\$/T	214.9	223.7	394.5	380.5	358.6	327.1	412.1	461.9	496.1	488.5	362.7

Sources: NIMEX, 1972-1983

Table AII-11-7 LBKP IMPORTS TO THE U.K. BY ORIGIN

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Barbados	MT									1,082
	\$/T									386.3
Belux	MT			576	1,108	40	1,000	3,340	663	
	\$/T			347.2	410.6	275.0	305.0	457.8	378.6	
Brazil	MT	30	30,398	531	52,554	49,000	58,060	55,139		
	\$/T	400.0	333.3	415.6	510.4	478.3	419.5	376.4		
Bermuda	MT				312	2,000	1,043	672		
	\$/T				503.2	491.5	446.8	346.7		
Canada	MT	99,384	97,052	85,995	60,063	57,315	44,092	44,798		
	\$/T	353.1	333.5	300.3	379.6	465.8	403.5	345.6		
Chile	MT		3,432	556				990		
	\$/T		378.0	392.1				396.0		
W.Germany	MT	387	611	33				2,024		
	\$/T	421.2	317.5	484.8	1000.0			254.4		
Finland	MT	69,625	63,980	79,963	106,155	106,608	108,000	71,237	92,973	
	\$/T	379.5	410.6	336.8	422.7	508.5	453.2	446.0	375.1	
France	MT	475	487	1,828	6,208	7,161	2,000	1,440	1,786	
	\$/T	341.1	260.8	312.9	385.6	474.7	496.5	373.6	315.2	
Nether-lands	MT	20	5	57						
	\$/T	250.0	400.0	473.7						
Norway	MT	5,276	4,543	10,369	12,085	11,304	4,500	8,082	9,330	
	\$/T	388.0	397.1	315.7	476.4	576.7	702.0	452.6	362.8	
Panama	MT								60	
	\$/T								400.0	
Sweden	MT	123,550	139,894	181,708	149,620	132,147	135,000	75,048	85,674	
	\$/T	386.1	422.3	342.1	420.0	506.8	485.5	436.0	360.1	
U.S.A.	MT	91,190	86,779	122,225	132,318	89,592	110,000	125,664	134,764	
	\$/T	357.5	395.7	308.4	348.6	468.1	436.2	387.1	323.8	

Sources: NIMEX, 1976-1983

Table AII-11-8 NBKP IMPORTS TO THE U.K. BY ORIGIN

		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Barbados	MT										
	\$/T										
Belux	MT		106			874		1,086		1,667	897
	\$/T		386.8			344.4		472.4		340.1	402.5
Brazil	MT					2,515	1,052		5,000	217	9,782
	\$/T					240.2	422.1		495.2	428.6	316.3
Bermuda	MT									216	
	\$/T									467.6	
Canada	MT		217,429	260,771	268,171	263,811	235,365	275,342	186,000	165,880	174,046
	\$/T		345.3	376.2	407.6	325.9	401.0	490.5	468.4	406.6	370.1
Chile	MT		790	5,731		1,966	408	2,673	11,000	11,464	25,965
	\$/T		383.5	342.9		331.1	370.1	488.6	135.4	369.6	375.5
W. Germany	MT				92	20	1,400				20
	\$/T				423.9	550.0	467.1				400.0
Finland	MT		48,728	68,131	49,213	207,884	88,383	89,556	99	73,217	58,631
	\$/T		358.2	378.2	424.1	173.0	440.1	518.5	511.5	464.4	408.1
France	MT			520		187	26			190	518
	\$/T			317.3		262.0	423.1			452.6	335.9
Italy	MT			731							
	\$/T			354.3							
Nether-lands	MT				19		19	585		1,000	40
	\$/T				368.4		473.7	494.0		425.0	400.0
Norway	MT		2,797	2,038	1,956	1,929	234	1,551	19	13,697	6,575
	\$/T		364.0	358.2	334.9	303.8	324.8	595.7	557.2	448.5	423.3
Panama	MT										
	\$/T										
Peru	MT										604
	\$/T										369.2
Sweden	MT		240,299	280,537	234,605	159,607	511,312	132,052	135	101,109	97,413
	\$/T		382.0	380.4	426.0	363.2	167.0	529.8	509.5	458.2	391.7
U. S. A.	MT		88,673	72,452	83,391	86,281	85,112	81,623	80	78,264	67,666
	\$/T		343.2	379.4	412.3	324.2	408.4	497.1	492.0	421.0	372.7

Sources: NIMEX, 1974-1983

Table AII-11-9 LBKP IMPORTS TO GREECE BY ORIGIN

		1981	1982	1983
Finland	MT	493	930	1,294
	\$/T	531.4	353.8	296.8
France	MT			17
	\$/T			529.4
Sweden	MT		1,014	1,625
	\$/T		341.2	320.0
U.S.A.	MT	1,297	2,608	197
	\$/T	461.8	368.9	487.3

Sources: NIMEX, 1981-1983

Table AII-11-10 NBKP IMPORTS TO GREECE BY ORIGIN

		1981	1982	1983
Canada	MT	94		
	\$/T	585.1		
Finland	MT	3,236	2,076	24
	\$/T	569.2	470.1	333.3
Sweden	MT		1,367	3,485
	\$/T		389.9	359.3
U.S.A.	MT	443	342	711
	\$/T	516.9	359.6	282.7

Sources: NIMEX, 1981-1983

Table AII-11-11 LBKP IMPORTS TO IRELAND BY ORIGIN

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Brazil	MT \$ / T					800 395.0				
Canada	MT \$ / T	86 220.9	505 372.3	2 500.0				1,618 506.2	174 643.7	
W. Germany	MT \$ / T			2 NA						
Finland	MT \$ / T	276 568.8	204 387.3					86 709.3		
France	MT \$ / T				20 350.0	1,101 378.7	1,950 411.8			
U.K.	MT \$ / T			1 2000.0		14 428.6	26 500.0		19 473.7	
Norway	MT \$ / T			51 352.9				1,002 531.9		
Sweden	MT \$ / T		1,734 411.2	2,527 443.2	2,650 343.0	1,500 432.0	4,196 461.4	4,185 508.5		
U.S.A.	MT \$ / T	10 900.0	1,148 480.0	514 387.2	1,291 426.8	1,680 501.2	1,975 457.2	4,172 449.9		

Sources: NIMEX, 1974-1983

Table AII-11-12 NBKP IMPORTS TO IRELAND BY ORIGIN

FR		1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Canada	MT	874	1,832	4,278	3,417	769	2,148	3,077	2,139		
	\$/T	165.9	392.5	364.2	403.6	325.1	400.8	402.0	484.3		
Finland	MT	421	624					1,308	3,230		
	\$/T	204.3	423.1					465.6	543.3		
U.K.	MT				87				19		
	\$/T				402.3				631.6		
Norway	MT		40	50							
	\$/T		400.0	340.0							
Sweden	MT	939	6,455	5,995	6,591	12,557	13,212	7,479	3,169		
	\$/T	335.5	400.2	375.0	437.1	355.9	435.3	454.6	501.7		
U.S.A.	MT	25	180	3,184		1,524	984	1,027	289	2	
	\$/T	320.0	333.3	397.3		339.9	340.4	517.0	560.6	500.0	

Sources: NIMEX, 1974-1983

Table AII-11-13 LBKP IMPORTS TO ITALY BY ORIGIN

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Argentina												
MT	200	45		1,205	2,837	2,103	9,180	13,886	10,167	6,195	7,133	10,368
\$/T	145.0	266.7		400.0	362.4	334.8	302.5	395.1	469.3	454.2	403.2	321.7
Brazil						26	50	5,169	12,245	7,024	8,141	11,666
\$/T						346.2	280.0	438.4	425.6	500.0	438.0	320.2
Canada	519	2,223	3,216	18,406	11,987	18,899	57,116	23,832	14,237	11,354	12,487	24,587
\$/T	181.1	207.4	431.6	372.9	328.7	362.8	305.8	403.5	463.4	528.7	499.2	365.0
Chile					2,436	8,580		1,833	3,156		2,451	1,535
\$/T					266.8	253.4		194.8	385.3		433.3	349.8
W. Germany	4,276	4,366	311	362	1,234	1,454	1,247	825	1,852	4,910	6,617	3,103
\$/T	216.8	221.9	382.6	403.3	393.8	396.8	332.0	524.8	493.0	524.0	450.8	344.2
Denmark			30								584	722
\$/T			333.3								287.7	235.5
Finland	7,586	7,302	3,559	12,638	13,686	14,399	39,715	48,392	32,731	40,588	41,288	41,758
\$/T	175.9	178.6	303.7	389.3	388.9	405.8	334.0	418.4	464.1	499.6	489.6	318.8
France	7,700	6,157	4,845	12,391	43,307	36,356	43,101	49,276	43,327	30,663	38,555	45,987
\$/T	175.2	230.8	360.6	403.8	371.7	356.5	303.7	395.5	451.2	423.1	403.6	316.5
U.K.					14							
\$/T					714.3							
Nether-lands					194			100	252	443	238	815
\$/T					376.3			450.0	420.6	541.8	373.9	265.0
Norway	212	816	715	1,224	3,044	3,624	8,879	9,217	3,606	3,212	1,164	430
\$/T	188.7	230.4	267.1	424.0	322.9	329.7	263.4	393.7	436.5	497.2	460.5	388.4
Sweden	9,943	20,978	11,724	37,635	49,416	45,725	61,020	55,521	35,324	39,021	27,912	35,237
\$/T	206.4	227.3	379.7	427.7	402.6	402.5	285.2	433.6	467.5	492.8	459.0	362.5
U.S.A.	3,654	7,147	1,452	33,799	48,467	34,099	36,901	41,656	21,512	10,138	12,781	19,749
\$/T	201.4	213.4	473.1	442.8	351.2	363.1	308.5	400.2	482.4	548.6	481.3	374.9

Sources: NIMEX, 1972-1983

Table AII-11-14 NBRP IMPORTS TO ITALY BY ORIGIN

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Argentina MT												467
\$/T												366.2
Brazil MT						201		3,077	24,164	18,875	22,778	19,109
\$/T					363.2			359.1	433.4	481.0	465.6	338.3
Belux MT				106		208		377		74	22	98
\$/T				415.1		427.9		376.7		621.6	681.8	357.1
Canada MT	1,472	4,184	7,709	180,165	233,725	246,285	309,121	329,890	378,565	315,475	274,870	213,042
\$/T	186.8	195.3	316.9	369.4	369.1	382.6	308.0	409.0	447.4	489.8	479.9	354.3
Chile MT					6,429	7,259	10,656	1,287	3,106	5,240	28,845	26,345
\$/T					310.2	306.8	274.8	349.7	357.1	402.3	399.3	295.0
W. Germany MT	5,475	7,216	4,055	1,586	2,064	2,087	2,864	4,005	3,010	946	2,717	1,670
\$/T	140.6	188.1	276.0	347.4	326.1	371.8	403.6	497.4	525.2	735.7	455.6	382.6
Denmark MT			80									
\$/T		125.0										
Finland MT	22,639	30,130	21,343	22,005	19,742	23,303	67,437	78,776	88,674	82,543	64,620	45,424
\$/T	178.1	193.6	302.5	400.5	392.5	398.6	343.0	438.9	474.5	492.4	508.8	368.3
France MT	933	1,691	964	500	2,751	474	3,120	616	1,615	732	1,897	2,725
\$/T	155.4	201.7	361.0	440.0	349.0	341.8	272.1	573.1	513.3	457.7	448.6	358.2
U.K. MT												
\$/T									405			
									476.5			
Nether-lands MT				61	66			101		136	194	192
\$/T				393.4	469.7			465.3		514.7	509.0	260.4
Norway MT	4,466	3,065	2,015	1,433	7,901	7,645	17,551	8,210	11,916	7,673	3,351	13,532
\$/T	189.4	227.4	335.0	464.1	400.5	360.8	300.8	440.0	463.8	501.8	456.0	365.2
Panama MT	125											
\$/T	160.0											
Peru MT				418					592			
\$/T				301.4					363.2			
Paraguay MT											216	
\$/T											453.7	
Sweden MT	44,181	52,538	42,681	88,942	122,389	95,530	142,680	174,030	141,966	120,447	110,722	105,597
\$/T	197.9	213.0	300.3	461.0	411.4	423.1	359.0	454.2	509.2	572.8	548.8	405.4
Venezuela MT								1,290				
\$/T								437.2				
U.S.A. MT	28,058	30,889	33,773	84,694	109,983	114,651	126,922	167,883	224,949	202,990	198,595	181,392
\$/T	216.9	216.7	346.2	409.6	364.7	380.3	399.9	422.5	479.4	503.7	482.7	372.4

Sources: NIMEX, 1972-1983

Table AII-11-15 LBKP IMPORTS TO THE NETHERLANDS BY ORIGIN

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Argentina	MT											
	\$/T								400			
									437.5			
Belux	MT	23		22,054	38,984	33,304	32,970	30,691	30,241	36,829	30,009	27,104
	\$/T	87.0		388.3	415.8	359.0	341.9	421.2	444.8	449.4	406.6	342.3
Brazil	MT						1,175	7,516	17,946	18,762	20,322	24,548
	\$/T						305.5	426.4	457.5	501.4	468.9	356.9
Canada	MT	1,719	1,022	776	1,330	28,301	31,605	31,755	33,330	34,096	30,393	26,162
	\$/T	160.6	214.3	311.9	339.1	391.1	302.0	378.7	398.5	476.1	424.6	323.1
Chile	MT										50	
	\$/T										340.0	
W.Germany	MT	1,615	2,590	340	57	15	81	61	922	513	166	24
	\$/T	156.7	178.4	650.0	333.3	466.7	191.5	475.4	489.2	473.7	512.0	500.0
Denmark	MT		22	65								
	\$/T		90.9	261.5								
Finland	MT	1,770	1,056	766	25,023	32,931	31,355	34,914	29,818	37,437	35,128	33,332
	\$/T	123.2	187.5	242.8	352.5	429.5	349.2	413.4	450.0	496.3	437.1	332.9
France	MT	9,699	200.1	13,349	89	648	1,778	356		24		116
	\$/T			306.5	337.1	362.7	331.8	410.1		250.0		379.3
U.K.	MT				596			108		49		
	\$/T				429.5			351.9		387.8		
Italy	MT											1
	\$/T											1000.0
Norway	MT			348	243	495	2,327	3,703	2,136	25		296
	\$/T			373.6	428.0	442.4	404.4	431.0	439.1	640.0		375.0
Panama	MT										6	1,916
	\$/T										500.0	340.8
Sweden	MT	3,849	1,127	2,356	20,382	33,215	24,721	28,770	16,229	17,927	14,584	14,655
	\$/T	167.8	181.0	278.9	413.3	438.1	425.1	352.3	424.5	454.4	473.2	369.9
U.S.A.	MT	1,239	4,469	5,064	36,398	14,608	15,263	26,716	22,871	16,838	13,594	43,074
	\$/T	201.8	182.1	304.3	348.1	392.4	357.9	308.1	418.5	472.4	436.8	309.0

Sources: NIMEX, 1972-1983

Table AII-11-16 NBKP IMPORTS TO THE NETHERLANDS BY ORIGIN

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Argentina												
MT												
\$/T												
Belux												
MT	345	490		842	1,062	3,344	531	1,436	1,043	1,334	1,054	377
\$/T	107.2	128.6		422.8	434.1	498.2	374.8	458.9	447.7	501.5	522.8	289.1
Brazil												
MT								2,383	2,284	2,988	532	2,764
\$/T								385.2	418.1	499.7	469.9	346.6
Canada												
MT	2,146	2,587	3,451	112,056	103,700	101,302	126,482	103,555	104,532	81,146	54,824	68,637
\$/T	195.2	197.9	314.1	328.0	407.0	376.4	314.7	377.6	403.9	443.6	449.6	341.9
Chile												
MT							172					72
\$/T							284.9					305.6
W. Germany												
MT	528	2,191	340	746	514	382	2,393	1,180	2,323	1,329	459	215
\$/T	161.0	187.6	305.9	392.8	476.7	473.8	295.0	490.7	475.2	510.2	512.0	423.3
Denmark												
MT		69										
\$/T		101.4										
Finland												
MT	19,092	18,832	18,955	15,328	16,077	13,862	30,592	34,766	37,814	32,910	31,518	40,929
\$/T	173.2	196.8	272.5	361.6	428.7	424.3	356.3	425.7	463.5	517.4	482.5	367.3
France												
MT	4,774	4,357	4,024	44		50		23	43	366		485
\$/T	154.8	184.3	322.1	363.6		340.0		434.8	604.7	609.3		362.9
U. K.												
MT										554		
\$/T										243.7		
Norway												
MT	28,141	26,083	19,131	1,969	3,377	3,555	759	486	48	856	301	3,695
\$/T	172.9	203.7	320.1	409.3	449.2	400.6	309.6	436.2	520.8	491.8	551.5	360.2
Sweden												
MT	26,005	31,186	26,232	59,865	71,802	86,809	85,151	93,906	79,274	54,317	50,148	43,742
\$/T	167.7	194.2	311.1	406.4	433.7	405.7	361.9	445.4	476.9	551.7	512.8	375.1
U.S.A.												
MT	9,362	5,668	3,548	35,091	39,882	35,492	51,715	66,344	77,278	81,227	93,048	63,697
\$/T	174.4	184.7	374.0	357.4	445.0	372.3	301.7	377.5	424.0	480.7	413.5	315.8

Sources: NIMEX, 1972-1983

Table AII-11-17 LBKP IMPORTS TO DENMARK BY ORIGIN

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Belux										
MT						500	2,503	750	1,980	3,708
\$/T			40			384.0	447.5	512.0	415.2	357.3
Brazil										
MT										
\$/T			375.0							
Canada										
MT				1,082						
\$/T				315.9						
W.Germany										
MT										1,328
\$/T										379.5
Finland										
MT	103	2,220	2,146	2,032	8,665	10,550	5,492	9,333	9,263	13,950
\$/T	301.0	363.5	422.6	328.2	336.2	399.2	458.0	514.0	457.6	348.7
Norway										
MT				3,998	8,869	11,008	3,576	2,876	4,920	5,165
\$/T				350.7	326.4	400.0	486.6	528.2	450.6	350.8
Sweden										
MT	1,822	5,512	9,466	9,339	17,007	15,673	10,501	14,499	18,344	19,850
\$/T	358.9	391.9	423.7	397.2	340.8	403.0	465.5	504.3	444.4	351.5
U.S.A.										
MT		497								10
\$/T		326.0								650.0

Sources: NIMEX, 1974-1983

Table AII-11-18 NBKP IMPORTS TO DENMARK BY ORIGIN

	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Belux										
MT							829		826	
\$/T							395.7		506.1	
Brazil										
MT							900			1,000
\$/T							455.6			358.0
Canada										
MT		2,551	6,333	1,785	5,794	5,584	2,543	5,806	4,697	7,841
\$/T		353.6	400.1	400.0	330.9	358.7	458.1	489.7	475.0	362.6
Chile										
MT				240						
\$/T				350.0						
W.Germany										
MT					330	515	1,869	823	499	
\$/T					275.8	396.1	484.2	507.9	462.9	
Finland										
MT	299	958	1,950	2,767	5,294	8,197	7,812	6,270	5,992	8,637
\$/T	264.2	375.8	412.8	288.0	345.7	408.3	465.7	514.5	458.6	362.3
Norway										
MT			634	1,582		1,158	5,339	1,469	6,370	5,908
\$/T			375.4	344.5		263.4	475.7	539.1	452.9	388.3
Sweden										
MT	7,307	18,330	15,227	13,267	14,076	20,724	22,163	22,555	25,642	28,061
\$/T	370.7	403.5	429.2	399.7	356.1	423.5	476.6	509.9	464.5	376.5
U.S.A.										
MT					1,038	3	531	10		5
\$/T					325.6	NA	412.4	900.0		1400.0

Sources: NIMEX, 1974-1983

Annex II-12

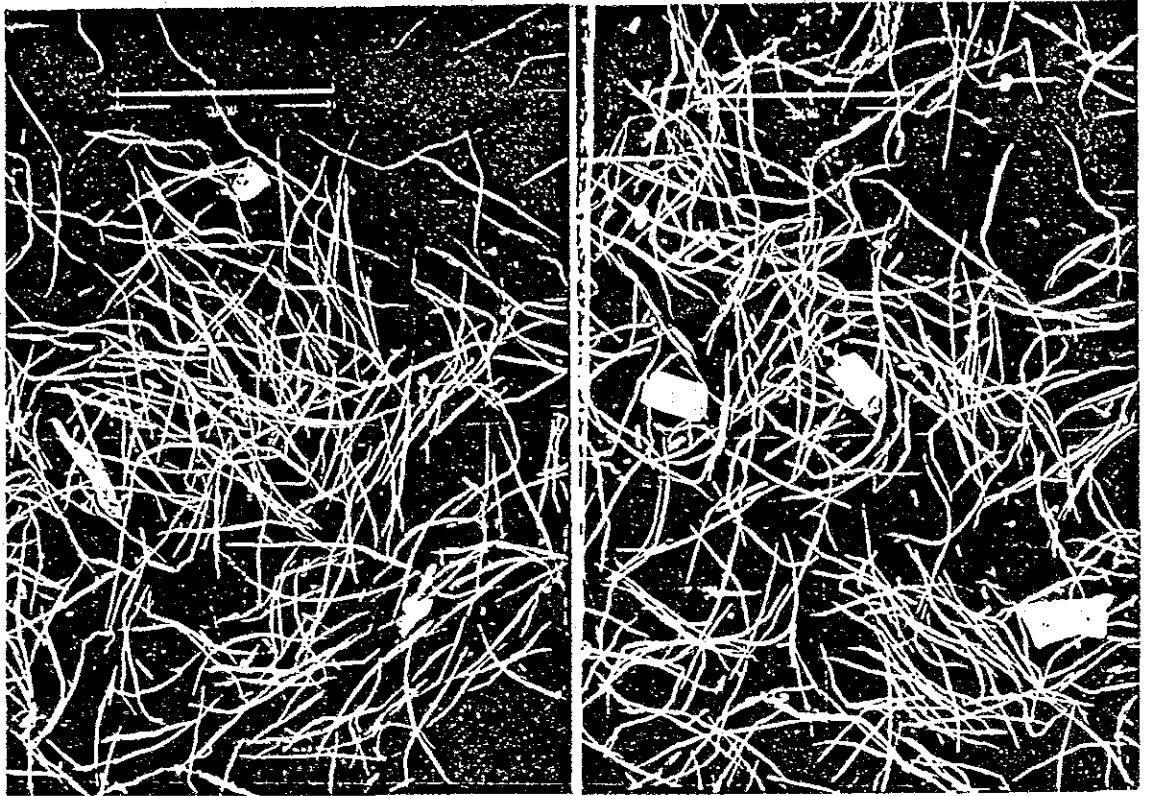
PHOTOGRAPH OF PULP FIBER AFTER BLEACHED

- Notes: 1. Enlarge rate; 30 times
2. WEC photograph is attached for reference.
It is mixed two Eucalyptus pulps. Mixing
Ratio is as follows,

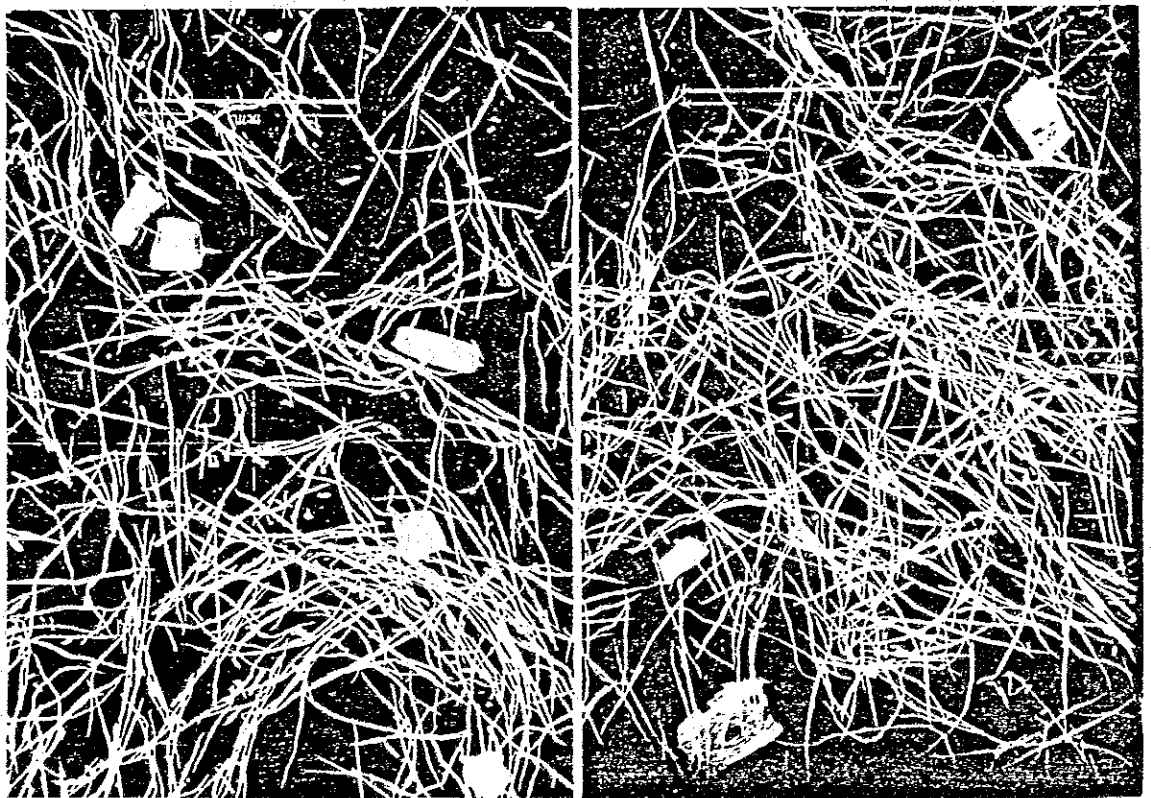
Eucalyptus Calophylla; 60 - 70%

Eucalyptus Deversicalor; 40 - 30%

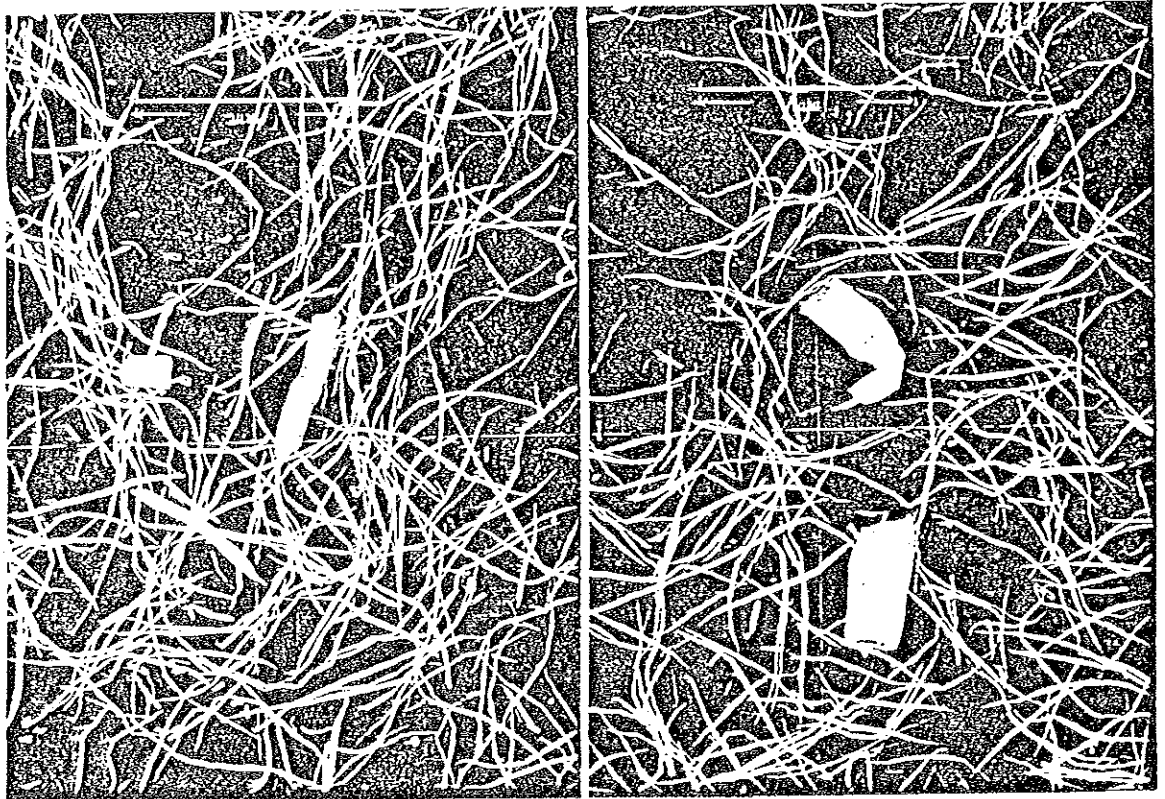
Test No. 2 E. Globulus x 30



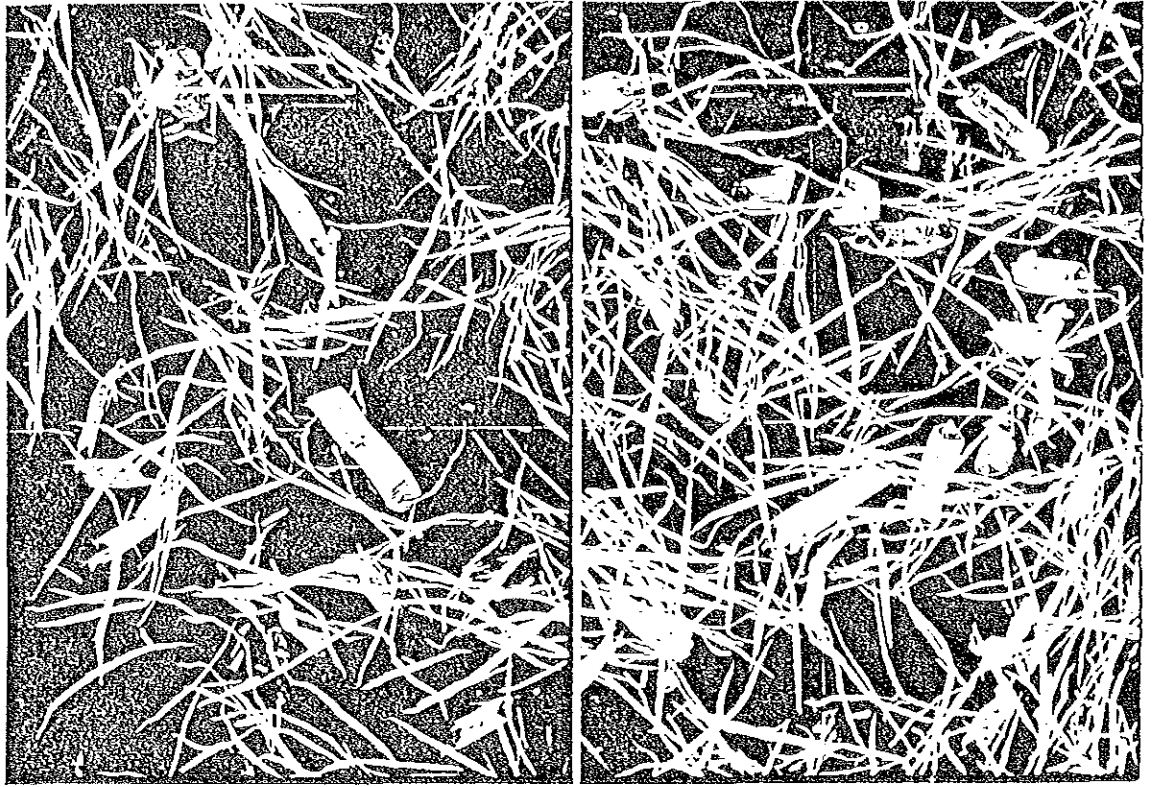
Test No. 1 E. Maidenii x 30



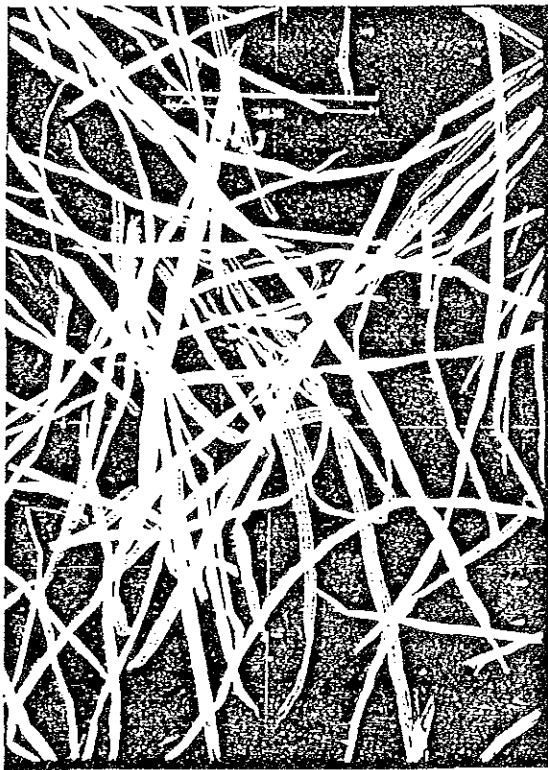
Test No. 3 E. Grandis x 30



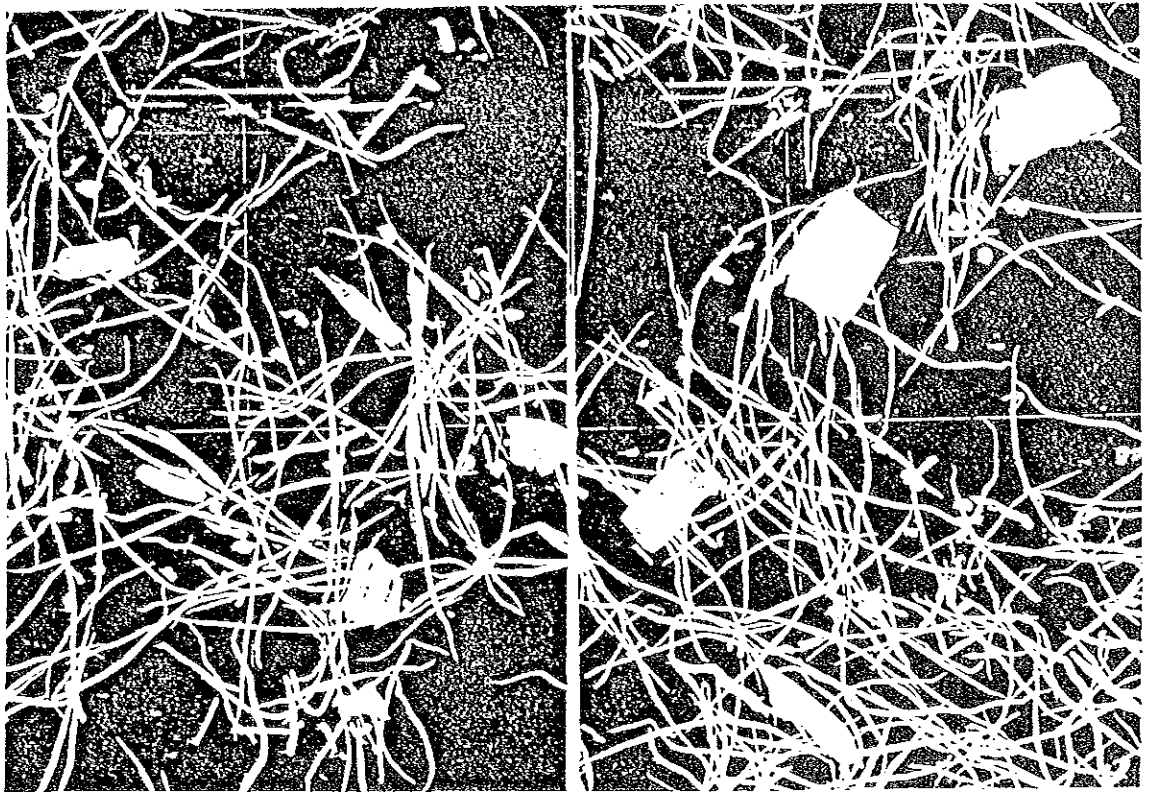
Test No. 4 Populus x 30



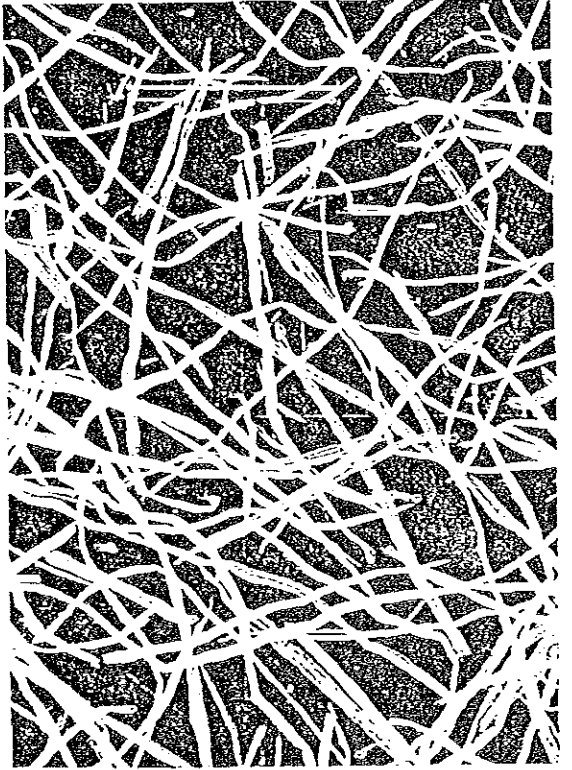
Test No. 5 P. Taede x 30



(REF.) WEC x 30



Test No. 6 P. Elliottii x 30



A N N E X I I I

Annex III-1 EXAMPLES OF INCENTIVE SYSTEM FOR
AFFORESTATION

Annex III-2 NECESSITY OF AFFORESTATION BY PULP
PLANT

Annex III-1

EXAMPLES OF INCENTIVE SYSTEM FOR AFFORESTATION

Annex III-1

EXAMPLES OF INCENTIVE SYSTEM FOR AFFORESTATION

1. Brazil

(1) In case of LEI5106

In case of private person, capital investments for afforestation and reforestation are exempted from the total income liable for taxation in the fiscal year of taxation base.

In case of juridical person, expenses related to afforestation and reforestation can be exempted upto 50% amount of income tax.

For instance, profit earned in 1984 fiscal year of taxation base is reported in next 1985. And investment spent in 1984 for forestation can be exempted from the income tax charged in 1985.

(2) In case of DECRETO LEI 1134

Exempted, beforehand upto 50% of income tax and the exempted sum can be spent for afforestation or reforestation. However such investment shall be done upto the end of the next year (the next of the reported year of income tax).

Such grace of incentive system can be applicable for the investment spent for forestation by himself of the tax payer or to invest for forestation project executed by the third party also. (from the data of Japan-Brazil Pulp Resources Development Inc.)

2. Chile

(1) In case of DECRETO LEY 701

Law No. 701 is radically giving encouragement forestation, and decided basis of adequate utilization of forestal resources, rights and duties of owners of suitable land for forestation and give the authority to such land to regulations of this law. In addition to the above showing duties of landloads to cut down of forest located at not suitable land and execution of development works, etc.

The National Intention for proclamations of this law are as under:

- a) To increase forestation space in order to include uneconomical productive area into production of resources.
- b) Preservation of natural resources of renewable and protection of inferior zone.

Enforcement of Laws and ordinance No. 701 is in charge of CONAF (Corporacion Nacional Forestal) and bear the responsibility of encouragement, management and control.

The major points of encouragement method of Laws and ordinance No. 701 are as under.

Aid for 75% of total expenditure estimated by CONAF for the forestation area included in afforestation planning at the preferential suitable land for afforestation. (from Forestation resources in Chile Project study in 1983 JETRO)

3. New Zealand

(1) Prime cost exemptable by taxation

Corporations who are operating forestation are allowed to exempt predetermined amount required for plantation and culture of it at the time of calculation of income tax in the year of each expences was paid.

(2) Encouragement subsidy for forestation

Private person and corporations who's expenditure of certain terms are not exceeding US\$300,000 are allowed to utilize encouragement subsidy for forestation, upto 50% of prime cost of plantation and culture of it to satisfy certain terms and conditions.

The limit of accumulated amount of subsidy during plantation to cut down is US\$750 per ha.

(3) Postponement of income

The income obtained by forestation is allowed to postpone it during continuous years of obtained it under the limit of not exceeding 4 years.

Which means the taxpayer obtained money in the taxation base year and spent it divided within the limited number of years he can pay the tax on the basis of sent amount per spent year.

(4) Inheritance tax

Price of forestation in being is exempted from liable amount for taxation of inheritance.

(from Rinkeikyo Geppo No. 266 Nov. 1983)

4. Japan

(1) Promotion policy for afforestation

a) Subsidy system

Country, metropolis and districts will grant subsidy to owners of forests for a part of plantation, for 40% of assessed amount of artificial plantation, improvement of natural forest and upbringing.

b) Financing system

Terms of financing is classified in different way, by with or without of the above subsidy.

In case of subsidy was granted, interest rate 4.6 - 6.5% per annum on the remaining amount. Repayment period within 30 years including grace period within 20 years.

In case of without subsidy interest rate 3.5 - 5.0% per annum. Repayment period within 30 - 35 years, including grace period within 20 years.

Among of the above, large scale afforestation and large scale expansion of afforestation are concerned interest rate during grace period is 4% per annum.

The large scale afforestation means to fulfill the following terms and conditions. - Private person who are operating exceeding area of 500 ha. - or -

Incorporation who are operating exceeding area of 500 ha or have regular employee more than 100 person.

(2) In addition to the above

There are aid for construction of path through forest, favorable rate for taxation for income from afforestation, etc.

Annex III-2

NECESSITY OF AFFORESTATION BY PULP PLANT

NECESSITY OF AFFORESTATION BY PULP PLANT

In generally speaking pulp plant shall be constructed at the place, where ample quantity of raw materials are available. But in this project, resources of raw materials are almost nothing, the pulp plant shall be constructed after created raw material resources by afforestation.

Accordingly, if there is any hindrance or delay in creation of raw material resources it might influence on construction of the plant and operation, consequentially there might be loss on the huge capital investment.

Judging from this point of view, afforestation shall be done by the Pulp Plant itself. It is the most safety and steady way.

If there is any difficulty to acquire land for afforestation and it become necessary to have cooperation from landlords of near to the factory, in such cases, it is absolutely necessary the following matters:

- (1) Guarantee for indisputable fulfilment of afforestation works in accordance with technical direction of The Pulp Plant.
- (2) Guarantee for indisputable fulfilment of supply the products from afforestation to the pulp plant.

However even if obtained cooperation of landlords it seems very difficult to make start the afforestation works all at once in accordance with the start-up timing of the Pulp Plant.

The Pulp Plant should make up its mind to create raw material resources by itself and start the afforestation by itself and demonstrate the growing up conditions of trees to the landlords, otherwise, landlords themselves could not feel interest to supply raw materials to the not existing pulp plant from the beginning.

In such way of thinking in case of Eucalyptus, because of the initial cut down will be done at 8 years old, if it was demonstrated during 4 years, at least approx. 50% of required quantity shall be afforested by the Plant itself. In case of Pinus it will be approx. 35%.

In order to guarantee the supply of raw material to the plant, to decide the extent of own forest shall depend upon conditions of forestal industry and not so simple to make decision instantly.

At the beginning stage of the paper and pulp industry in Japan, the construction of their plant had been started after closing long term contract of wood supply, for security, with Government owned forest. Cut down works of wood were executed by themselves. After the grown up of operating companies of deforestation, it was given out on the basis of contract works.

After many years, other wood industry is also developed and demand of wood for other industry than paper and pulp is increased. The wood afforestation is also increased following development of other use. The procurement amount share of wood by pulp plant was coming increased in Japanese history.

In Uruguay, at present there are almost no raw material resources, afforestation should be done by plant itself such resolution is absolutely necessary, even if acquisition of land is another matter.

(In Japan there are such method that the landlord furnish their land for the other party who wish to afforest on it and latter party execute afforestation by their own expenses and at the time of cut down the profit earned shall be shared by each other.)

ANNEX IV

Annex IV-1 PROCESS FLOW SCHEME AND PROCESS
DESCRIPTION

Annex IV-2 CODES AND STANDARDS

Annex IV-3 MAJOR EQUIPMENT LIST

ANNEX IV-1

PROCESS FLOW SCHEME AND PROCESS DESCRIPTION

1. Wood Preparation and Chip Handling (Figure AIV-1-1)

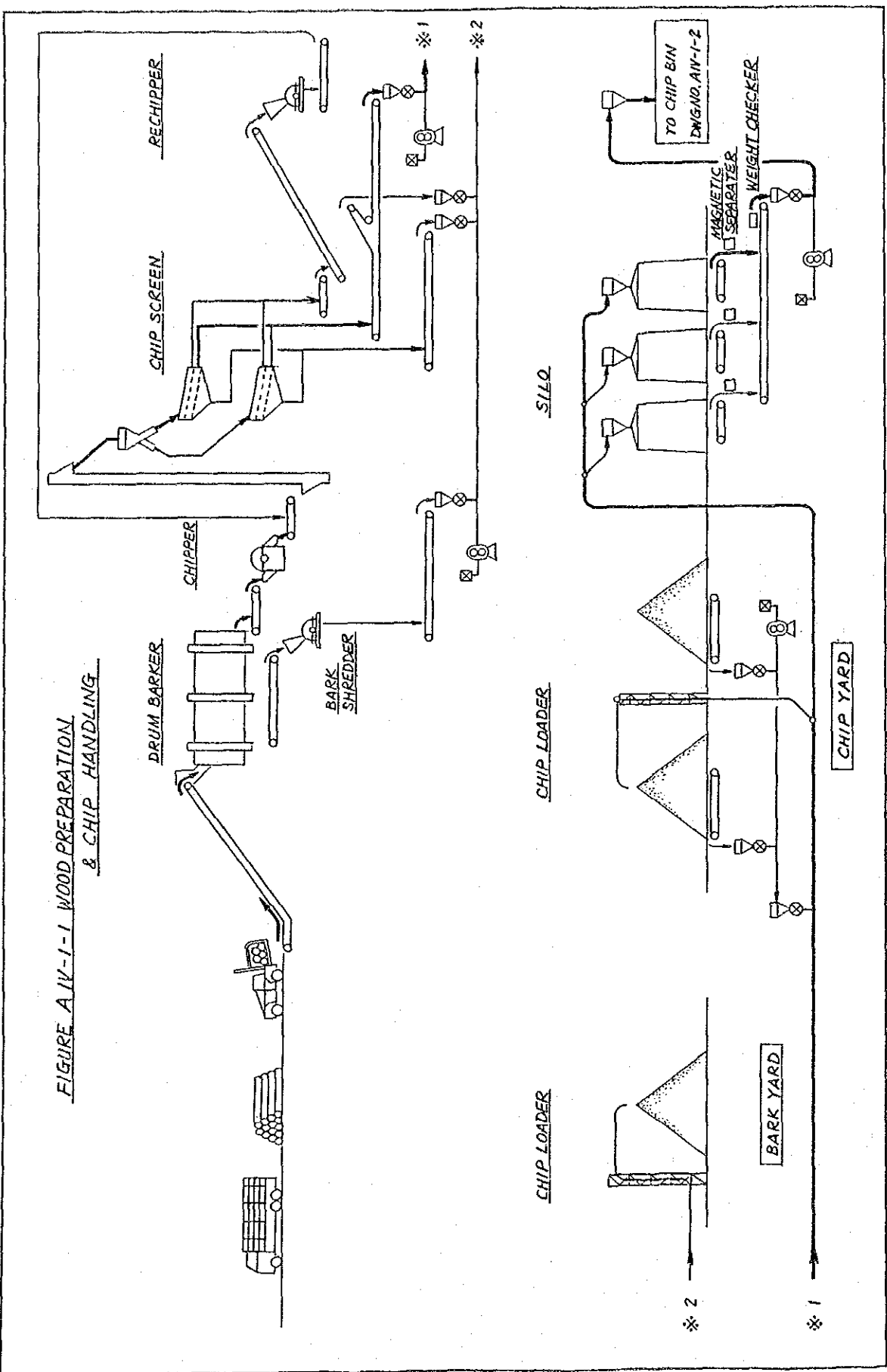
Wood preparation is provided with two trains of machine line which converts logs into chips. The capacity of chip production is 220 tons per hour and lines are operated in 14 hours a day.

Logs are debarked by drum barkers of dry type. Bark removed from logs is cut by bark crushers and sent to the bark yard for boiler fuel.

Debarked logs are chipped by chippers to chip fragments suitable for the succeeding process. The chips are separated into over sized chips, acceptable sized chips and dust by multistage vibratory screens. The over sized chips and slivers are returned to rechippers to make them acceptable sized chips again. Chip dust and fine are sent to the bark boiler as fuel through the bark yard.

The product chips are sent to the silos or stored in the chip yard. The chips from the silos are sent to the cooking section continuously by pneumatic conveyors. Chips are made up from the chip yard to the silos when the chips are getting fewer in the silos.

FIGURE A IV-1-1 WOOD PREPARATION & CHIP HANDLING



2. Cooking (Figure AIV-1-2)

The chips are stored after the transport band in a small chip bin from which they are fed by the bottom vibra bin into the chip meter. This machine measures the flow of chips and its speed regulates the production of pulp out of the digester.

The chip meter is followed by a low pressure feeder sealing off the steaming vessel in which the chips are presteamed at a pressure of approx. 1.5 kg/cm^2 in order to remove air and gases contained inside the chips. This facilitates the subsequent impregnation.

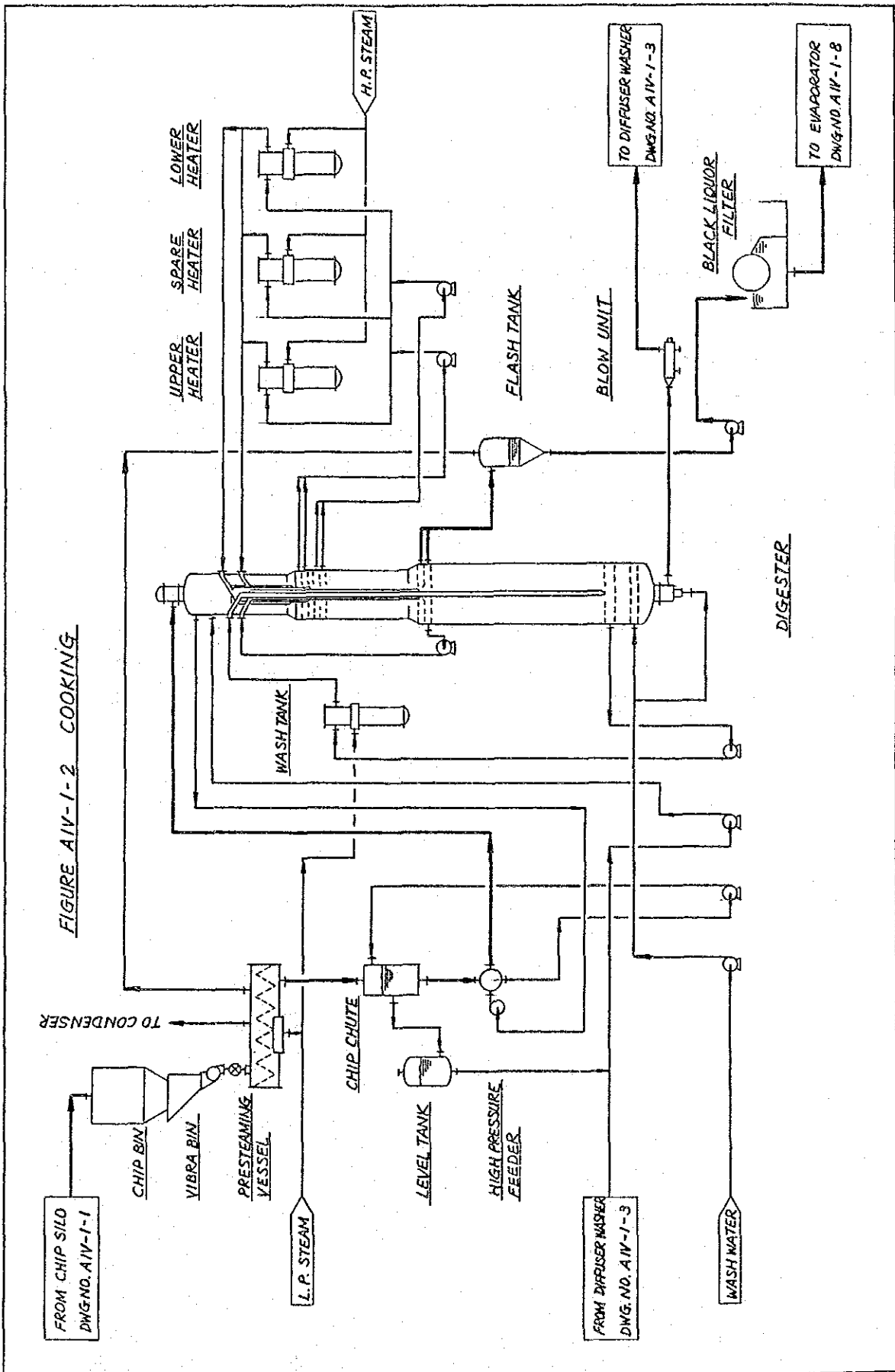
From the steaming vessel the chips fall down into the high pressure feeder. It is in this machine that the chips are moved from low pressure into the high pressure of the following digester. By the special pocket arrangement of this feeder the chips are sluiced into the following digester with liquor pumped by the standard centrifugal pump. In the top separator of this vessel, liquor is withdrawn to the suction side of the pump and consequently the sluicing of chips is carried out by a closed circulation.

In the top part of the vessel, steam is added to bring the chips up to the cooking temperature. Partway down in the digester a small circulation of liquor ensures that the heat added is evenly distributed.

The cooking takes place in the upper part of the vessel and the Hi-Heat countercurrent washing in the lower part. Wash liquor is added through the high pressure pump and is extracted through the strainers in the middle of the vessel to the first flash tank.

Steam from this flash tank is used for the presteaming of the chips and the flashed steam from the second flash tank is used to heat water. The black liquor is sent to evaporation by the pump.

The cooked chips are discharged from the digester through the outlet device and are then blown to the following washing stage.



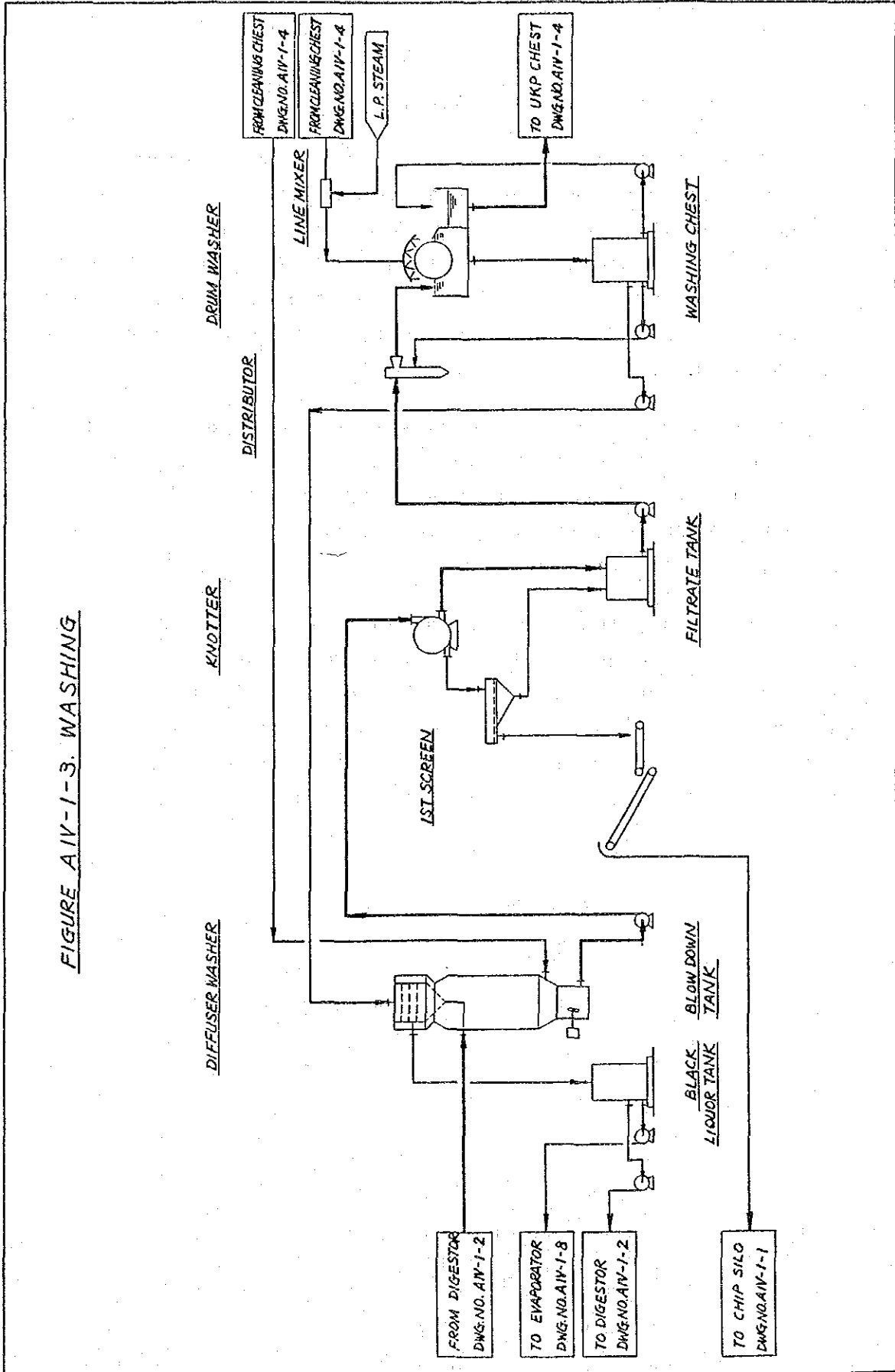
3. Washing (Figure AIV-1-3)

The pulp from the digester is blown into the bottom part of the diffuser at atmospheric pressure, a temperature of approximately 100°C and a medium consistency. In the diffuser the pulp is washed by displacement with wash water and fallen straight down into the storage tank with its agitator.

On the other hand, the black liquor in pulp is extracted by wash water and becomes the diluted black liquor, which is backed into the bottom of the digester. The washed pulp after diluting to approximately 3% is pumped to the pressure knoter. Knots in the pulp are separated there and discharged to the vibratory screen to recover them which are returned to the digester.

The pulp after knotting is pumped to the single-stage valveless vacuum washer and then the pulp is discharged to the first screening unit.

FIGURE AIV-1-3. WASHING



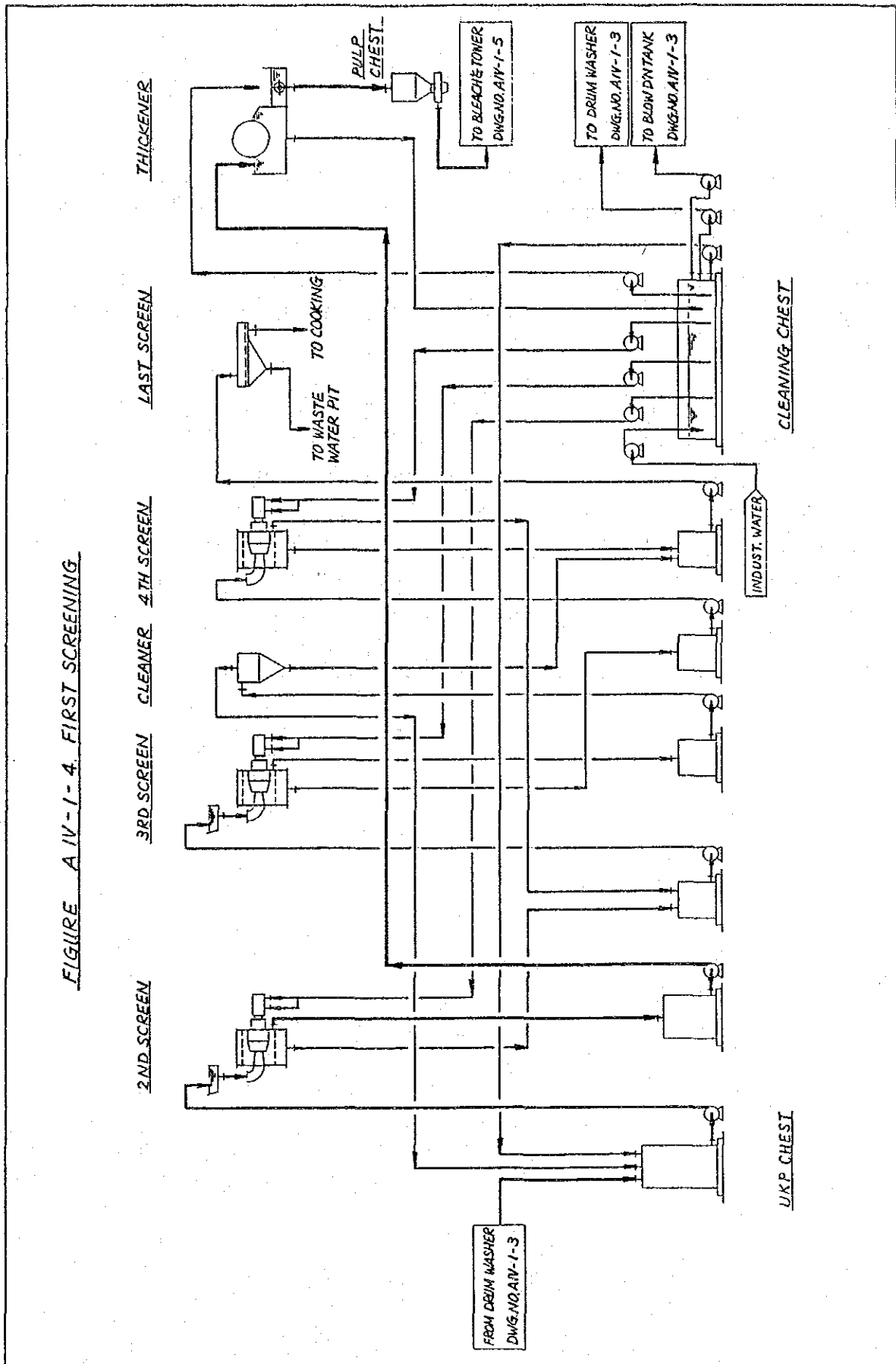
4. First Screening (Figure AIV-1-4)

In screening section it is performed to remove contaminant dusts and particles from good papermaking fibers. The washed pulp after diluted to 1.5 - 2.0% pulp consistency with dilution water is pumped to the primary screens of which type are gravity centrifugal. The accepts from the primary screens are gathered and pumped to the thickener, then stored with medium pulp consistency in the UKP chest.

The reject stream from the primary screens is pumped to the following screens which are set up in turn the secondary screens (gravity centrifugal type), the centrifugal cleaners, the tertiary screens (gravity centrifugal type) and the tail screen (vibratory type).

These screens are required to concentrate contaminants in the reject stream and good fiber returns to the process. Thus pulp fiber in the reject stream through centrifugal screens and cleaners is very little. In addition, half of it is recovered by the tail screen and returned to the cooking section. The amount of reject fiber is usually less than 1%.

FIGURE A IV-1-4. FIRST SCREENING



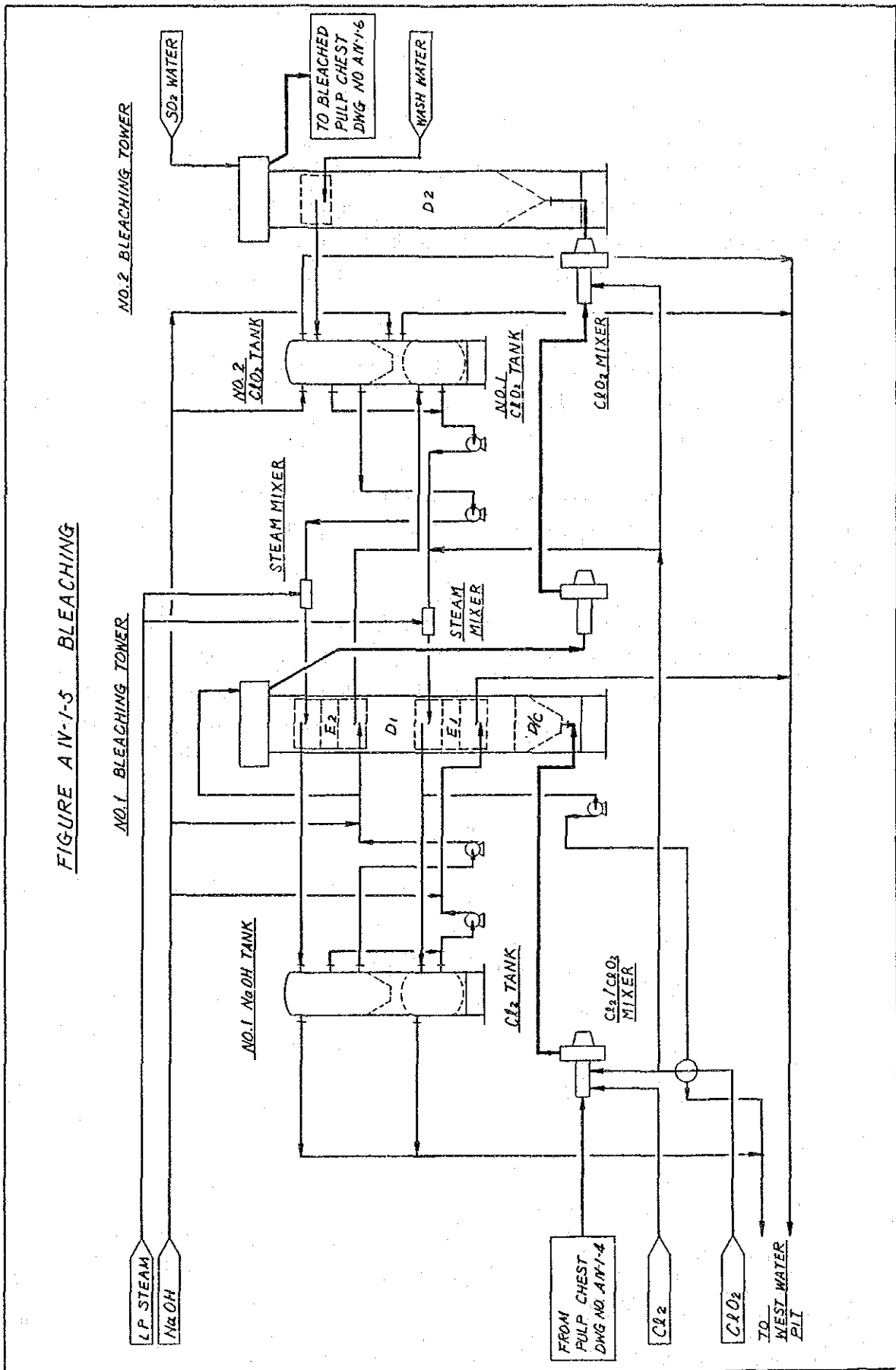
5. Bleaching (Figure AIV-1-5)

The screened pulp is discharged from UKP Chest through the high density pump with its vacuum system in order to remove air. The displacement bleach tower is followed by the mixer for C/D stage and the pulp is then passed through the bottom part of the first displacement tower. In this tower the C/D, E₁, D₁ and E₂ stages are carried out.

For high brightness the D₂ stage should have a long retention time, and therefore this stage is carried out in a separate tower. The pulp is pumped from the first tower to the second tower by the high density pump with its vacuum system and it is passed through the mixer for ClO₂. Wash water is added to the last diffuser which is positioned after the D₂ stage in the second tower to eliminate residual bleach chemicals.

The BKP is discharged to the second screening unit.

FIGURE A IV-1-5 BLEACHING



6. Second Screening (Figure AIV-1-6)

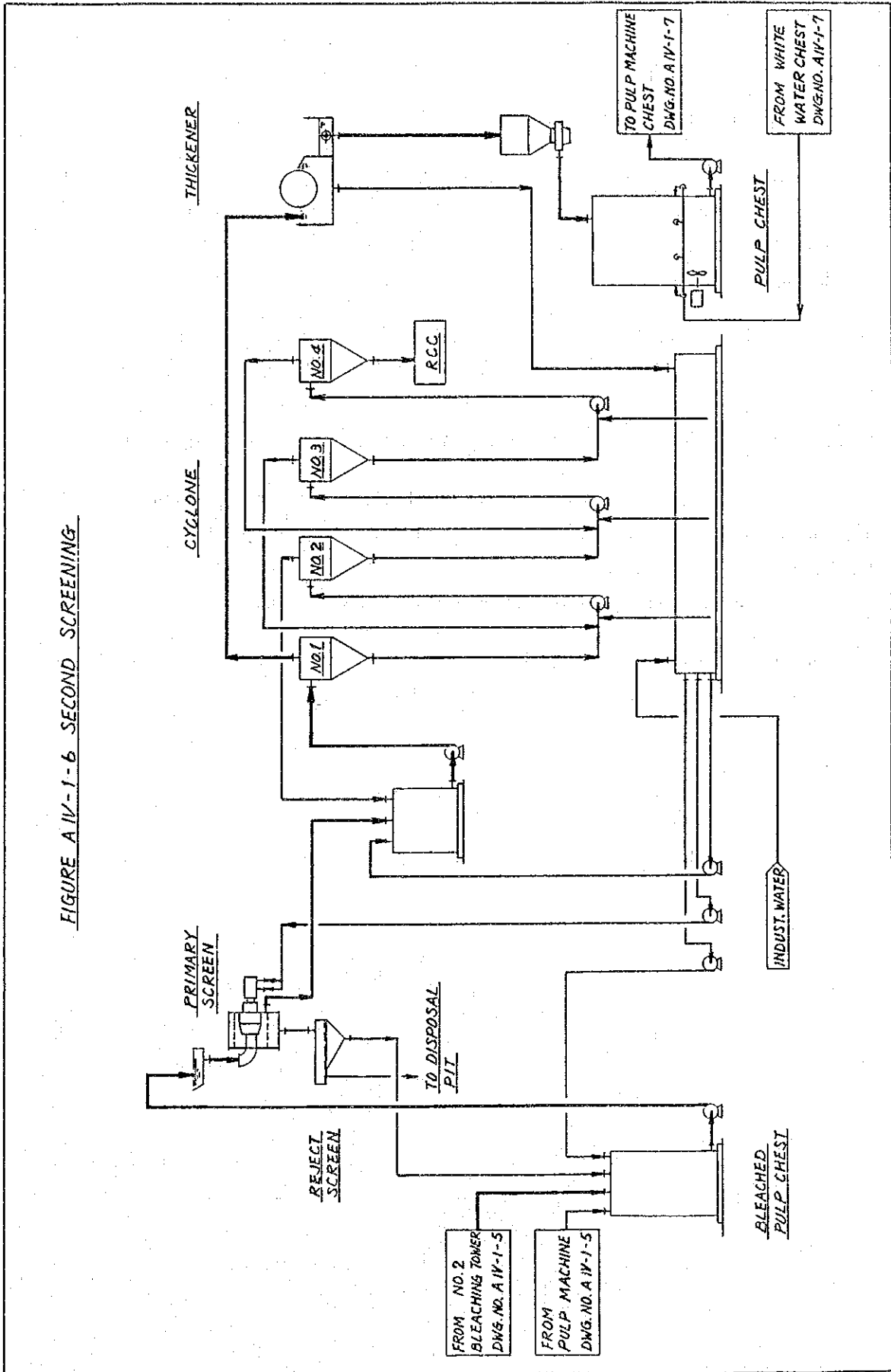
The BKP after diluted approximately 2.0% consistency is pumped to the primary screen (gravity centrifugal type). Contaminant large dusts and particles such as broken piece of bleach tower lining are rejected and disposed by following vibratory screen.

The accept from primary screen is pumped to four-stage centrifugal cleaner after diluted under 1% consistency to eliminate fine particles.

The accept from first-stage centrifugal cleaner is sent to the paper machine through rotary valveless thickeners and BKP storage tank.

The additional stages of centrifugal cleaner are required to concentrate contaminants in the reject stream and return good fiber to the process. Thus the fiber loss is minimized on this screening. The amount of reject fiber is usually less than 1%.

FIGURE A IV-1-6 SECOND SCREENING



7. Pulp Machine (Figure AIV-1-7)

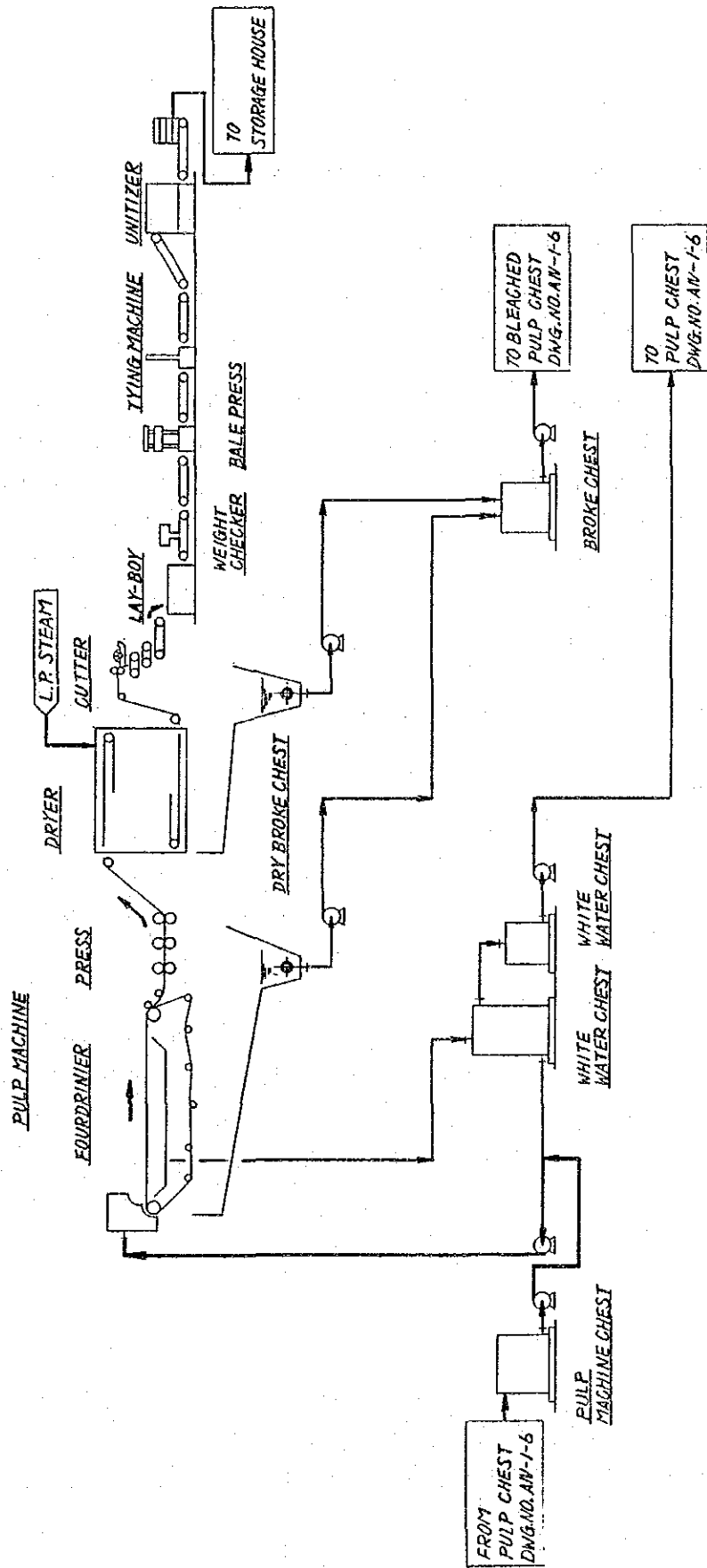
Bleached and cleaned pulp is sent to the pulp machine. The machine consists of a sheet-forming wet end (fourdrinier), a press section, a drying section and a slitting and sheet-cutting finishing part.

On the fourdrinier a glassy layer of white water containing fibers is dewatered initially. Pulp web remained on the fourdrinier is sent to the press part where the dryness is raised to approx. 50% bone-dry by means of heavy duty press.

After that the pulp web is carried into the dryer where it moves over a number of dryer decks and its dryness is raised to about 10%. The pulp web is then slit and cut into the specified size of sheet (600mm x 800mm) by a rotating knife drum.

The sheets drop onto a pallet and piled. Bales, piles of pulp sheets, are carried to after packing lines.

FIGURE AIV-1-7 PULP MACHINE



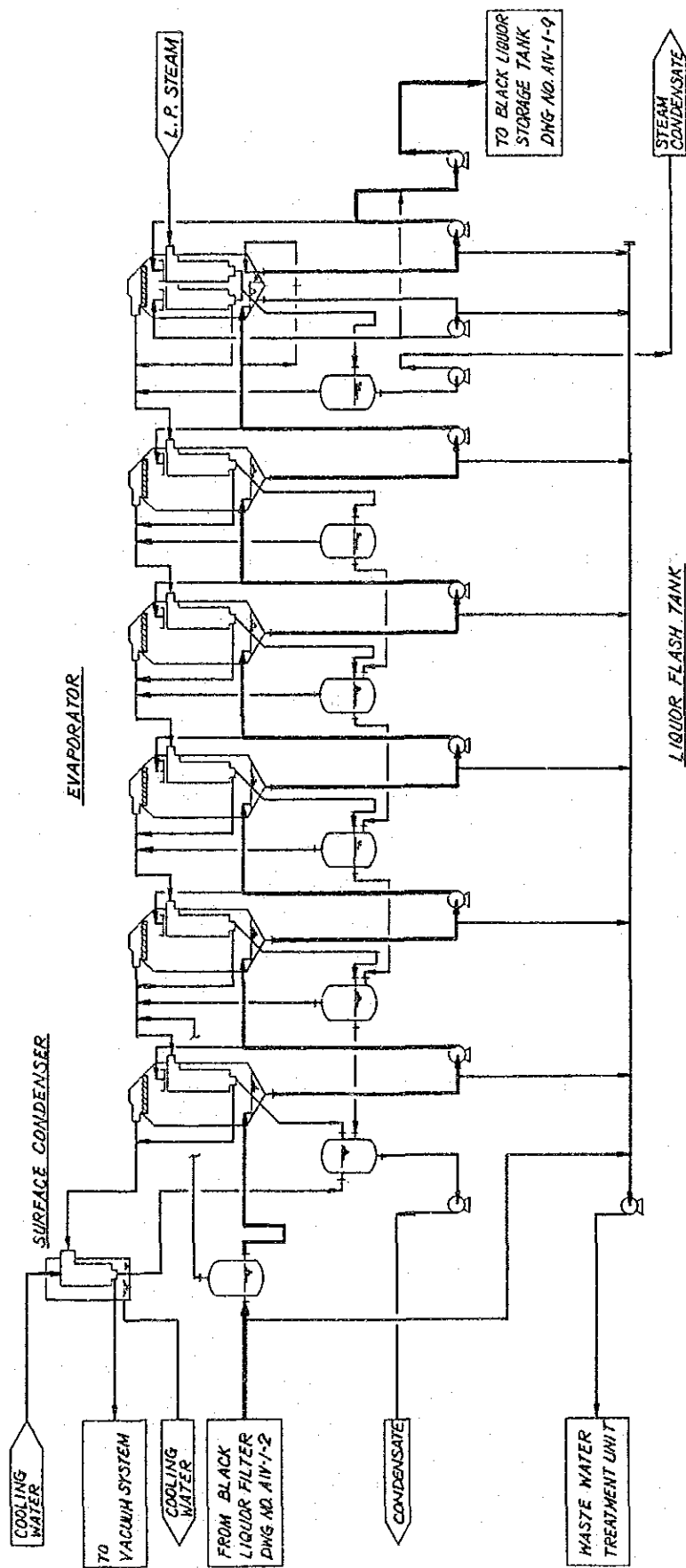
8. Black Liquor Evaporation (Figure AIV-1-8)

The dilute black liquor from the washing unit is supplied 18% solids, while concentrated black liquor is burned at 70% solids. The large amount of water (5 - 7 lb water per lb dry solids) must be evaporated economically so the maximum net fuel value can be realized from the burning.

The bulk of the water removal is carried out in the multiple-effect evaporators, a series of evaporators operated at different pressures so that the vapor from one evaporator body becomes the steam supply of the next evaporator. The main advantage of the multi-effect system is high steam efficiency, which can be as high as 5.0 lbs water evaporated per lb of steam for sextuple effect system.

A representative set of sextuple-effect evaporators is shown in Figure AIV-1-8. The effects are numbered with respect to steam and vapor flow; the steam feed goes to the pressurized first effect, which usually contains two liquor effects. The weak liquor flow is usually split between the first two effects at the other end where the liquor boils at lower temperature under vacuum conditions. As the liquor moves from one effect to the next, the pressure increases, the boiling temperature increases, the solids concentration increases, and the volume of liquor decreases. The pressures in the entire system are determined by the vacuum applied to the last vapor space and the initial steam pressure.

FIGURE AN-1-8 BLACK LIQUOR EVAPORATION



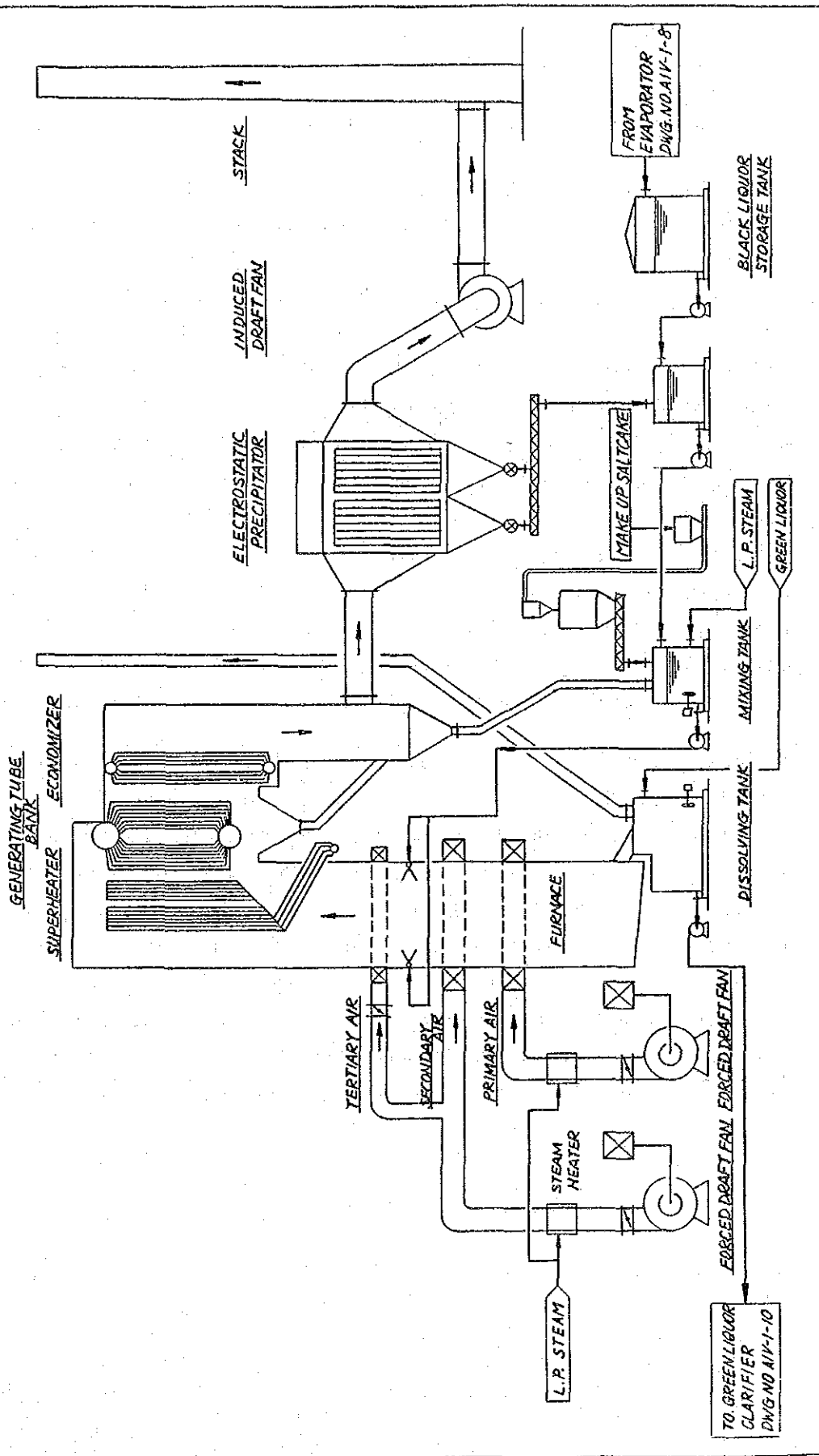
9. Recovery Boiler (Figure AIV-1-9)

The recovery furnace/boiler is at the heart of the kraft recovery process, and fulfils the following essential functions:

- (1) Evaporates residual moisture from the liquor solids.
- (2) Burns the organic constituents with maximum combustion efficiency.
- (3) Supplies heat for steam generation.
- (4) Reduces oxidized sulfur compounds to sulfide.
- (5) Recovers inorganic chemicals in molten form.
- (6) Conditions the products of combustion to minimize chemical carryover.

The "heavy" black liquor is sprayed into the furnace. The liquor droplets dry and partially pyrolyze before falling onto the char bed. Incomplete combustion in the porous char bed causes carbon and carbon monoxide to act as reducing agents to convert sulfate and thiosulfate into sulfide. The heat is sufficient to melt the sodium salts, which filter through the char bed to the floor of the furnace; the smelt flows by gravity through water-cooled spouts to the dissolving tank.

FIGURE AIV-1-9 RECOVERY BOILER

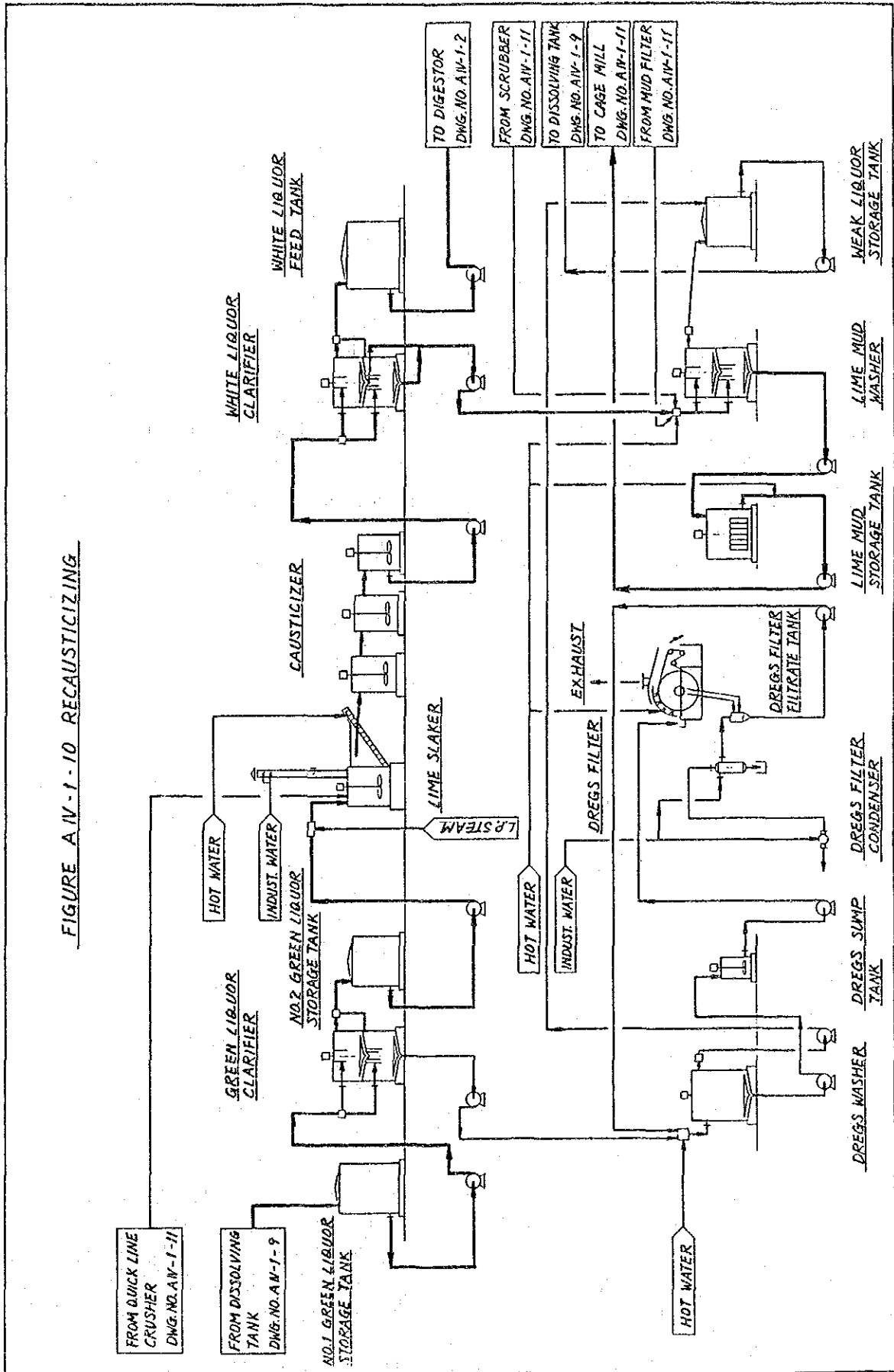


10. Causticizing (Figure AIV-1-10)

The function of the causticizing equipment is to turn the green liquor produced by the recovery boiler into white liquor. The green liquor is made by desolving smelt in the recovery boiler, and its chief components are sodium carbonate (Na_2CO_3) and sodium sulfide (Na_2S). This green liquor contains insoluble substance called dregs which is settled and removed by the green liquor clarifier. The dregs are rinsed with the dregs washer and the dregs filter, and the soda contained in the dregs is recovered. The cleared green liquor is heated to over 90°C by the green liquor heater, and then passes through the lime slaker and the causticizer, and during this period, causticizing reaction is carried out. In this reaction, the lime (CaO) fed to the lime slaker is first broken into $\text{Ca}(\text{OH})_2$, and reacting to sodium carbonate (Na_2CO_3), turn into caustic soda (NaOH) and calcium carbonate (CaCO_3).

This slurry is separated into liquor and solid by the white liquor clarifier, and the liquor is sent to two interchangeable check filters to reduce the solid content less than 10 ppm then transferred to the digesting process as white liquor. The solid which contains a large amount of white liquor is first diluted and rinsed at the mud washer, and after being stored in the mud storage agitator, is filtered and washed with the lime mud filter. The sludge coming from the lime mud filter is dehydrated to the moisture content of less than 30%, and is supplied to the rotary kiln.

FIGURE A IV-1-10 RECAUSTICIZING

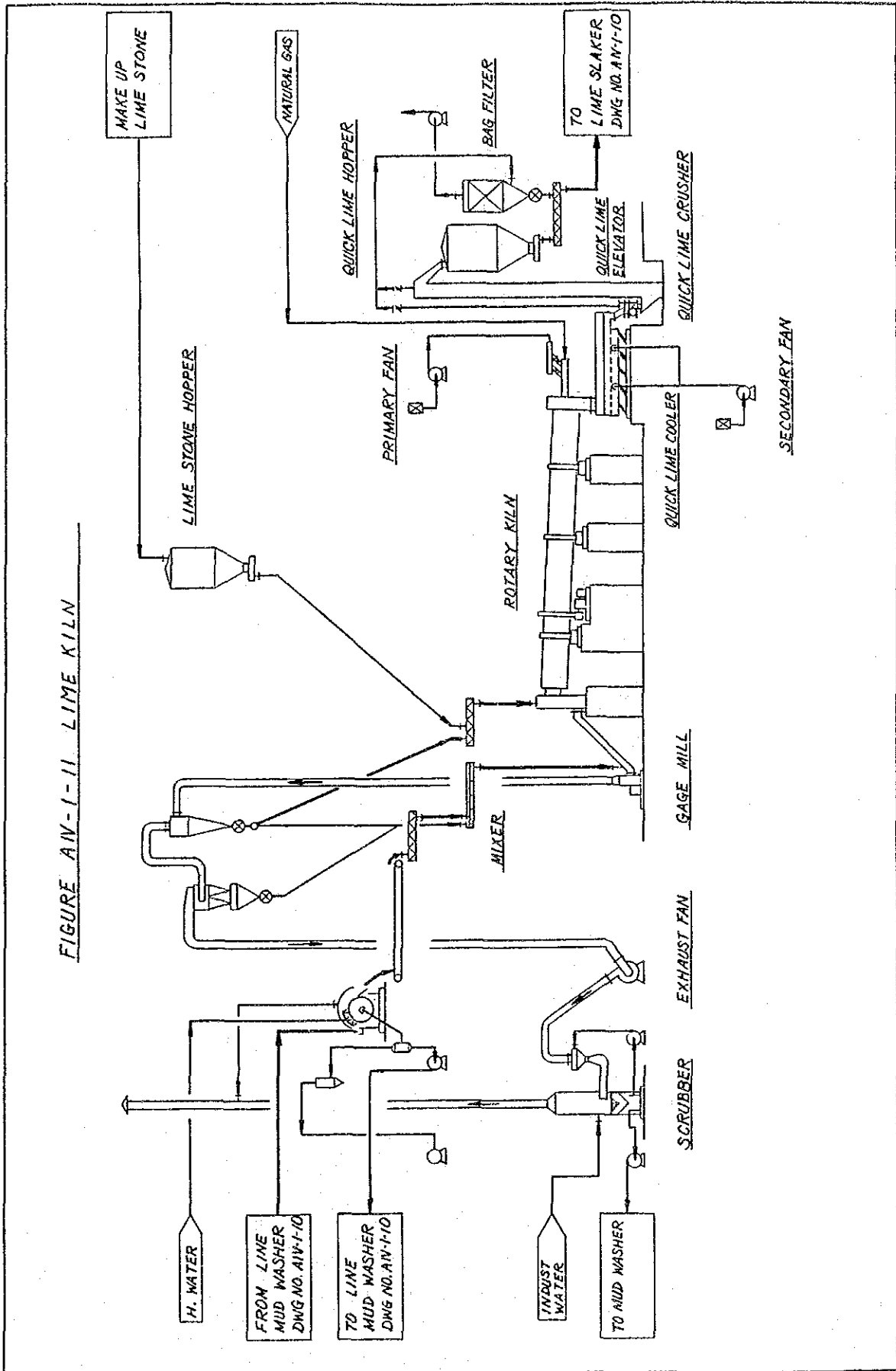


11. Lime Kiln (Figure AIV-1-11)

The lime mud-limestone mixture is heated and decomposed into lime (CaO) and carbon dioxide (CO₂) gas in the kiln. The heat required for these operations is supplied by burning natural gas at the lower (discharge) end of the kiln.

The kiln rotates very slowly around its horizontal axis and has slight slope toward the discharge end; this causes the solid material to move in a slow and regular flow to the discharge end of the kiln. At the same time the flame and hot gases of combustion are moving up the kiln to the feed end where the spent gases (products of combustion, decomposition, and evaporation) are removed by an induced draft fan.

FIGURE AIV-1-11 LIME KILN



ANNEX IV-2

CODES AND STANDARDS

1. Standards for Tanks and Pressure Vessels

- | | |
|-------------------|--|
| 1) JIS B8243 | Japanese Industrial Standards |
| 2) JIS B8250 | Japanese Industrial Standards |
| 3) ANSI B96.1 | Welded Aluminum-Alloy Field-Erected Storage Tanks |
| 4) ASME | Boiler and Pressure Vessel Code Sect. VIII, Div. 1 & 2 |
| 5) ASME | Sect. I Power Boilers |
| 6) BS 5500 | |
| 7) AD - Merkblatt | |
| 8) TRD | Technische Regel für Dampfkessel |

2. Rotating Equipment Standards

- | | |
|---------|------------------|
| 1) ANSI | Centrifugal Pump |
| 2) ISO | Centrifugal Pump |
| 3) ANSI | Compressor |

3. Heat Exchanger Standards

Shell and Tube Heat Exchangers

- | | |
|--------------|--|
| 1) TEMA | |
| 2) JIS B8249 | |

4. Instrumentation Standards

- 1) ISA Instrument Society of America
- 2) ANSI C1 National Electrical Code (NEC) (NFPA NO.70)
- 3) NEMA National Electrical Manufacturers Association
- 4) NFPA 493 Intrinsically Safe Process Control Equipment for Use in Hazardous Location
- 5) NFPA 496 Purged Enclosures for Electrical Equipment
- 6) IEC International Electro Technical Commission

5. Electrical Standards

- 1) NEC The National Electrical Code
- 2) NEMA National Electrical Manufacturers Association Standards
- 3) NFPA 493 Standard for Intrinsically Safe Process Control Equipment for Use in Hazardous Location
- 4) NFPA 496 Standard for Purged and Ventilated Enclosures for Electrical Equipment in Hazardous Locations

6. Structural, Building, and Foundation Standards

- | | |
|---------|--|
| 1) ACI | American Concrete Institute |
| 2) AISC | American Institute of Steel
Construction |
| 3) AIJ | Architectural Institute of
Japan |
| 4) JASS | Japanese Architectural
Standard Specification |
| 5) CEIJ | Civil Engineer Institute of
Japan |

7. Fire Fighting Standard

- | | |
|---------|---------------------------------------|
| 1) NFPA | The National Fire Protection
Assn. |
|---------|---------------------------------------|

8. Piping Standards and Codes

- | | |
|----------------|--|
| 1) ANSI B31.3 | US Standard Code for Piping System |
| 2) ANSI B16.5 | Forged Flanges |
| 3) ANSI B16.9 | Welding Fittings |
| 4) PFI | Pipe Fabrication Institute |
| 5) ANSI B31.1 | Power Piping |
| 6) ANSI B16.34 | Steel Buttwelding End Valves |
| 7) ASME | Boiler and Pressure Vessel Code, Section VIII Pressure Vessles-Division 1, Section VIII Alternate Rules for Pressure Vessels-Division 2, and Section IX Welding Qualifications |
| 8) NFPA 30 | Flammable and Combustible Liquids Code |

9. Building Mechanical Facilities Standards

- 1) ASHRAE American Society of Heating,
Refrigerating and
Air-Conditioning Engineers
- 2) ANSI American National Standard
Institute

10. Safety Standards, Codes and Practices for Plant Design

- 1) IP The Institute of Petroleum
- 2) NFPA National Fire Protection
Association
- 3) OSHA Occupational Safety and
Health Administration
- 4) ANSI Safety for Requirement of
Paper Pulp Mill

11. Materials Standards

- 1) ASTM American Society for Testing
and Materials
- 2) JIS Japanese Industrial
Standards
- 3) BS British Standards
Institution
- 4) DIN Deutscher Normenausschus

12. Analytical Method for Waste Water

- 1) ASTM Standards Part 31 Water
- 2) WHO Standards for Drinking Water

13. Painting & Coating Standards

- 1) NAPCA National Association of Pie Coating Applicators Specifications
- 2) AWWA C203 Coal-tar protective Coating and Lining for Steel Water Pipelines - Enamel and Tape - Hot Applied
- 3) SIS 05-5900 Pictorial Surface Preparation Standards for Painting Steel Surfaces
- 4) SIS 18.51.11 European Scale of Degree of Rusting for Anticorrosive Paints
- 5) MUNSELL Munsell Book of Colour
- 6) JIS Japanese Industrial Standards
- 7) SSPC Steel Structure Painting Council
- 8) ASTM American Society for Testing and Materials

9) BS

British Standards
Institution

10) NACE

National Association of
Corrosion Engineers

14. Insulation Standards

1) JIS

Japanese Industrial
Standards

2) ASTM

American Society for Testing
and Materials

3) TIMA

Thermal Insulation
Manufactures Association

4) MIL

Military Specification

5) USAEC

United States Atomic Energy
Commission Regulatory Guide
1.36

15. Civil & Marine Standards

- | | |
|-----------|--|
| 1) AASHTO | American Association of
State Highway and
Transportation Officials |
| 2) ACI | American Concrete Institute |
| 3) AISC | American Institute of Steel
Construction |
| 4) AWWA | American Water Works
Association |
| 5) AWS | American Welding Society |
| 6) UBC | Uniform Building Code |
| 7) ASTM | American Society for Testing
and Materials |
| 8) IMCO | Inter-Governmental Maritime
Consultative Organization |
| 9) DIN | |
| 10) AIJ | Architectural Institute of
Japan |
| 11) JASS | Japanese Architectural
Standard Specification |
| 12) CEIJF | Civil Engineer Institute of
Japan |
| 13) JPHA | Japan Port and Harbor
Association |

ANNEX IV-3

MAJOR EQUIPMENT LIST

1. Wood Preparation and Chip Handling

<u>Service</u>	<u>Description</u>
Drum Barker	Dry type, 2 Sets
Bark Shredder	Hammer Crusher, 2 Sets
Chipper	Disk Chipper, 2 Sets
Chip Screen	Vibrating Screen, 2 Sets
Rechipper	
Pneumatic Conveyor	
Chip Silo	

2. Cooking - Kamyra continuous digesting process

<u>Service</u>	<u>Description</u>
Chip Bin	
Chip Meter	
Low Pressure Feeder	
Steaming Vessel	Horizontal
High Pressure Feeder	
Top Separator	
Digester	Steam/Liquid Phase Type
Below Unit	
Cyclone	
Sand Trap	
Inline Drainer	

3. Washing - Kamyra continuous diffuser washer process

<u>Service</u>	<u>Description</u>
Diffuser Washer	Kamyra continuous diffuser Washer, 1 Set
Drum Washer	Valveless Washer, 1 Set
Screen	Pressure Knotter
Screen	Vibratory Screen

4. First Screening

<u>Service</u>	<u>Description</u>
Screen	Gravity Centrifugal Screen
Screen	Vibratory Screen
Cleaner	Centrifugal Cleaner
Thickener	Valveless Filter

5. Bleaching - Kamyr Displacement Bleaching Process

<u>Service</u>	<u>Description</u>
Displacement Bleaching Tower	D/C-E ₁ -D ₁ -E ₂ , 1 Set
Displacement Bleaching Tower	D ₂ , 1 Set
Mixer	for Cl ₂ /ClO ₂ , 1 Set
Mixer	for ClO ₂ , 1 Set

6. Second Screening

<u>Service</u>	<u>Description</u>
Screen	Gravity Centrifugal Screen
Screen	Vibratory Screen
Thickener	Valveless Filter
Cleaner	Centrifugal Cleaner

7. Pulp Machine

<u>Service</u>	<u>Description</u>
Pulp Machine	
Fourdrinier	
Press Part	
Dryer	
Cutter	
Lay-bay	
Weight Checker	
Bale Press	
Tying Machine	
Unitizer	

8. Black Liquor Evaporation

<u>Service</u>	<u>Description</u>
Evaporator	Free Flow Evaporator, 6 Sets
Surface Condenser	
Barometric Condenser	

9. Recovery Boiler and Bark Boiler

<u>Service</u>	<u>Description</u>
Recovery Boiler	Including Steam Air Heater and Soot Blowing Equipment
Mixing Tank	
Dissolving Tank	
Electric Precipitator	
Bark Boiler	
Dust Collector	
Stack	

10. Causticizing

<u>Service</u>	<u>Description</u>
Green Liquor Clarifier	Cylindrical
Lime Slaker	Rake
Causticizer	Cylindrical
White Liquor Clarifier	Cylindrical
Dregs Washer	Cylindrical
Dregs Filter	Belt
Lime Mud Washer	Cylindrical
Lime Mud Filter	Precort

11. Lime Kiln

<u>Service</u>	<u>Description</u>
Rotary Kiln	Cylindrical
Scrubber	Venturi-Scrubber
Cage Mill	Gage Mill
Cyclone	
Lime Stone Feeder	Screw Feeder
Quick Lime Feeder	Weighing Screw Feeder
Burner	Gas Burner
Lime Stone Hopper	
Quick Lime Hopper	
Screw Feeder	

12. Chlor-Alkali Plant

<u>Service</u>	<u>Description</u>
Brine Reactor	
Brine Clarifier	
Brine Filter	
Chelating Resin Tower	
Electrolyzer	

13. Chlorate Plant

<u>Service</u>	<u>Description</u>
Electrolyzer	
Gas Separator	
Reactor	

14. Chlorine Dioxide Plant

<u>Service</u>	<u>Description</u>
Generator	
Reboiler	
ClO ₂ Absorber	
Cl ₂ Absorber	
Salt Cake Filter	

15. Sulfur Burning Plant

<u>Service</u>	<u>Description</u>
Sulfur Burner	
Gas Cooler	
Gas Absorber	

16. Water Treatment Facilities

<u>Service</u>	<u>Description</u>
Clarifier	Center Drive
Sand Filter	Vertical Cylindrical
Activated Carbon Filter	"
Ion Exchanger	"
Degasifier	"
Mixed Bed Polisher	"
Belt Filter Press	Horizontal

17. Power Plant

<u>Service</u>	<u>Description</u>
Turbine	
Generator	

18. Waste Water Treatment

<u>Service</u>	<u>Description</u>
Clarifier	Center Drive
Aerator	Surface Turbine
Thickener	Cylindrical

19. Dewatering Facilities

<u>Service</u>	<u>Description</u>
Belt Filter Press	Horizontal

ANNEX VI

Annex VI-1 BASE CASE

Annex VI-2 CASE 1

Annex VI-3 CASE 2

Annex VI-4 CASE 3

