

TABLE 1

**RECOMMENDED RAW WATER QUALITY
CRITERIA AND FREQUENCY OF MONITORING**

NO.	PARAMETERS	COLUMN I	COLUMN II			COLUMN III
		ACCEPTABLE VALUE	FREQUENCY TO BE MONITORED			SOURCE OF REFERENCE
		mg/l (unless otherwise stated)	SURFACE	GROUND	DIRECT IMPOUNDING	
<u>GROUP I</u>						
1	TOTAL COLIFORM	5,000 MPN/100ml or cfu/100ml	W	M	M	WHO1
2	TURBIDITY	1,000 NTU	W	M	M	WHO2
3	COLOUR	300 TCU	W	M	M	WHO1
4	pH	5.5 – 9.0	W	M	M	MAL
<u>GROUP II</u>						
1	TOTAL DISSOLVED SOLIDS	1,500	M	Y/4	Y/4	WHO1
2	BIOLOGICAL OXYGEN DEMAND	6	M	Y/4	Y/4	WHO1
3	CHEMICAL OXYGEN DEMAND	10	M	Y/4	Y/4	WHO1
4	CHLORIDE	250	M	Y/4	Y/4	MAL
5	ANIONIC DETERGENT MBAS	1.0	M	Y/4	Y/4	WHO1
6	AMMONIA (as N)	1.5	M	Y/4	Y/4	WHO1
7	NITRATE (as N)	10	M	Y/4	Y/4	MAL
8	IRON (as Fe)	1.0	M	Y/4	Y/4	MAL
9	FLUORIDE	1.5	M	Y/4	Y/4	WHO1
10	HARDNESS	500	M	Y/4	Y/4	MAL
11	MANGANESE	0.2	M	Y/4	Y/4	WHO1
<u>GROUP III</u>						
1	MERCURY	0.001	Y/4	Y/4	Y/4	MAL
2	CADMIUM	0.003	Y/4	Y/4	Y/4	MAL
3	SELENIUM	0.01	Y/4	Y/4	Y/4	WHO1
4	ARSENIC	0.01	Y/4	Y/4	Y/4	MAL
5	CYANIDE	0.07	Y/4	Y/4	Y/4	MAL
6	LEAD	0.05	Y/4	Y/4	Y/4	MAL
7	CHROMIUM	0.05	Y/4	Y/4	Y/4	WHO1
8	SILVER	0.05	Y/4	Y/4	Y/4	MAL
9	COPPER	1.0	Y/4	Y/4	Y/4	MAL
10	MAGNESIUM	150	Y/4	Y/4	Y/4	MAL
11	SODIUM	200	Y/4	Y/4	Y/4	MAL
12	ZINC	3	Y/4	Y/4	Y/4	MAL
13	SULPHATE	250	Y/4	Y/4	Y/4	MAL
14	MINERAL OIL	0.3	Y/4	Y/4	Y/4	MAL
15	PHENOL	0.002	Y/4	Y/4	Y/4	WHO1

TABLE 1 (continued)

**RECOMMENDED RAW WATER QUALITY
CRITERIA AND FREQUENCY OF MONITORING**

NO.	PARAMETERS	COLUMN I	COLUMN II			COLUMN III
		ACCEPTABLE VALUE	FREQUENCY TO BE MONITORED			SOURCE OF REFERENCE
		mg/l (unless otherwise stated)	SURFACE	GROUND	DIRECT IMPOUNDING	
	GROUP IV					
	<u>ORGANOCHLORINE PESTICIDES:</u>					
1	ALDRIN/DIELDRIN	0.00003	Y/4	Y/4	Y/4	MAL
2	DDT	0.002	Y/4	Y/4	Y/4	MAL
3	HEPTACHLOR & HEPTACHLOR EPOXIDE	0.00003	Y/4	Y/4	Y/4	MAL
4	METHOXYCHLOR	0.02	Y/4	Y/4	Y/4	MAL
	<u>NON-ORGANOCHLORINE PESTICIDES:</u>					
5	HEXACHLOROBENZENE	0.001	WN	Y/4	Y/4	MAL
6	LINDANE	0.002	Y/4	Y/4	Y/4	MAL
7	CHLORDANE	0.0002	Y/4	Y/4	Y/4	MAL
	<u>HERBICIDES:</u>					
8	2,4-D (DICHLOROPHENOXYACETIC ACID)	0.03	WN	Y/4	Y/4	MAL
	GROUP V					
	<u>RADIOACTIVITY:</u>					
1	GROSS α	0.1Bq/l	WN	WN	WN	MAL
2	GROSS β	1.0Bq/l	WN	WN	WN	MAL
TOTAL	40 PARAMETERS					

- W : Indicates parameters to be monitored at least once a week.
M : Indicates parameters to be monitored at least once a month.
Y/4 : Indicates parameters to be monitored at least once in 3 months.
Y : Indicates parameters to be monitored at least once a year.
WHO1 : Refers to WHO International Standards for Drinking Water 1963.
WHO2 : Refers to WHO Guidelines for Drinking Water Quality Vol. 1 & 2 1984.
MAL : Refers to values adapted for Malaysian conditions.

Notes:

Collection of samples of both raw and treated water for examination for toxic substances should be carried out more frequently if values above the acceptable values are known to be present in the source of supply, or where such potential pollution exists.

TABLE 2

DRINKING WATER QUALITY STANDARDS AND FREQUENCY OF MONITORING

NO.	PARAMETERS	COLUMN I	COLUMN II				SOURCE OF REFERENCE
		MAXIMUM ACCEPTABLE VALUE	FREQUENCY TO BE MONITORED				
		mg/l (unless otherwise stated)	WATER TREATMENT PLANT OUTLET	SERVICE RESERVOIR OUTLET	DISTRIBUTION SYSTEM	WELL/ SPRING	
	GROUP I						
1	<u>MICROBIOLOGICAL:</u> TOTAL COLIFORM	MPN METHOD/MEMBRANE FILTRATION METHOD: MUST NOT BE DETECTED IN ANY 100ml SAMPLE	W	W	M	2Y	MAL
2	<i>E. coli</i> OR THERMOTOLERANT COLIFORM BACTERIA	ABSENT IN 100ml SAMPLE	W	W	M	2Y	WHO2
3	COLIFORM BACTERIA						
4	FAECAL STREPTOCOCCI	MEMBRANE FILTER METHOD: ABSENT IN 100ml SAMPLE	WN	WN	WN	WN	EEC
5	CLOSTRIDIUM PERFRINGENS	MPN METHOD: < 1 IN 100ml SAMPLE	WN	WN	WN	WN	MAL 1990
6	VIRUSES	ABSENT	WN	WN	WN	WN	NZ
7	PROTOZOA	ABSENT IN 100ml	WN	WN	WN	WN	NZ
8	HELMINTHS	ABSENT IN 100ml	WN	WN	WN	WN	NZ
	<u>PHYSICAL:</u>						
9	TURBIDITY	5 NTU	W	W	M	2Y	WHO2
10	COLOUR	15 TCU	W	W	M	2Y	WHO2
11	pH	6.5 – 9.0	W	W	M	2Y	MAL
12	FREE RESIDUAL CHLORINE	0.2 – 5.0	W	W	M	2Y	WHO1
13	COMBINED RESIDUAL CHLORINE	NOT LESS THAN 1.0	W	W	M	2Y	MAL1990
14	MONOCHLORAMINE	3	WN	WN	WN	WN	WHO2
	GROUP II						
1	<u>INORGANIC:</u> TOTAL DISSOLVED SOLIDS	1000	M	M	Y/2	2Y	WHO2
2	CHLORIDE	250	M	M	Y/2	2Y	WHO2
3	AMMONIA (as N)	1.5	M	M	Y/2	2Y	WHO2
4	NITRATE (as N)	10	M	M	Y/2	2Y	WHO1
5	IRON	0.3	M	M	Y/2	2Y	WHO2
6	FLUORIDE	0.4 – 0.6	M	M	Y/2	2Y	MAL
7	HARDNESS	500	M	M	Y/2	2Y	WHO1
8	ALUMINIUM	0.2	M	M	Y/2	2Y	WHO2
9	MANGANESE	0.1	M	M	Y/2	2Y	WHO2
	GROUP III						
1	MERCURY (TOTAL)	0.001	Y/4	Y/2	Y	2Y	WHO2
2	CADMIUM	0.003	Y/4	Y/2	Y	2Y	WHO2
3	ARSENIC	0.01	Y/4	Y/2	Y	2Y	WHO2
4	CYANIDE	0.07	Y/4	Y/2	Y	2Y	WHO2
5	LEAD	0.01	Y/4	Y/2	Y	2Y	WHO2
6	CHROMIUM	0.05	Y/4	Y/2	Y	2Y	WHO2
7	COPPER	1	Y/4	Y/2	Y	2Y	WHO1
8	ZINC	3	Y/4	Y/2	Y	2Y	WHO2
9	SODIUM	200	Y/4	Y/2	Y	2Y	WHO2
10	SULPHATE	250	Y/4	Y/2	Y	2Y	WHO2

TABLE 2 (continued)

DRINKING WATER QUALITY STANDARDS AND FREQUENCY OF MONITORING							
NO.	PARAMETERS	COLUMN I	COLUMN II				SOURCE OF REFERENCE
		MAXIMUM ACCEPTABLE VALUE	FREQUENCY TO BE MONITORED				
		mg/l (unless otherwise stated)	WATER TREATMENT PLANT OUTLET	SERVICE RESERVOIR OUTLET	DISTRIBUTION SYSTEM	WELL/ SPRING	
	<u>TRICHALOMETHANE:</u> The sum of the ratio of the concentration to each of the guideline value should not exceed 1.						
11	CHLOROFORM	0.2	Y/4	Y/2	Y	2Y	WHO3
12	BROMOFORM	0.1	Y/4	Y/2	Y	2Y	WHO2
13	DIBROMOCHLOROMETHANE	0.1	Y/4	Y/2	Y	2Y	WHO2
14	BROMODICHLOROMETHANE	0.06	Y/4	Y/2	Y	2Y	WHO2
15	SELENIUM	0.01	Y/4	WN	WN	WN	WHO2
16	SILVER	0.05	Y/4	WN	WN	WN	MAL 1990
17	MAGNESIUM	150	Y/4	WN	WN	WN	MAL 1990
18	ANTIMONY	0.005	WN	WN	WN	WN	WHO2
19	BARIIUM	0.7	WN	WN	WN	WN	WHO2
20	BORON	0.5	WN	WN	WN	WN	WHO3
21	MOLYBDENUM	0.07	WN	WN	WN	WN	WHO2
22	NICKEL	0.02	WN	WN	WN	WN	WHO2
23	URANIUM	0.002	WN	WN	WN	WN	WHO3
24	HYDROGEN SULFIDE	0.05	WN	WN	WN	WN	WHO2
25	MINERAL OIL	0.3	WN	WN	WN	WN	MAL 1990
26	PHENOL	0.002	WN	WN	WN	WN	WHO1
27	BROMATE	0.025	WN	WN	WN	WN	WHO2
28	CHLORITE	0.2	WN	WN	WN	WN	WHO2
29	2-CHLOROPHENOL	0.0001	WN	WN	WN	WN	WHO2
30	2,4-DICHLOROPHENOL	0.0003	WN	WN	WN	WN	WHO2
31	2,4,6 -TRICHLOROPHENOL	0.2	WN	WN	WN	WN	WHO2
32	FORMALDEHYDE	0.9	WN	WN	WN	WN	WHO2
33	DICHLOROACETIC ACID	0.05	WN	WN	WN	WN	WHO2
34	TRICHLOROACETIC ACID	0.1	WN	WN	WN	WN	WHO2
35	CHLORAL HYDRATE (TRICHLOROACETALDEHYDE)	0.01	WN	WN	WN	WN	WHO2
36	DICHLOROACETO-NITRILE	0.09	WN	WN	WN	WN	WHO2
37	DIBROMOACETO-NITRILE	0.1	WN	WN	WN	WN	WHO2
38	TRICHLOROACETO-NITRILE	0.001	WN	WN	WN	WN	WHO2
39	CYANOGEN CHLORIDE (as CN)	0.07	WN	WN	WN	WN	WHO2

TABLE 2 (continued)

DRINKING WATER QUALITY STANDARDS AND FREQUENCY OF MONITORING							
NO.	PARAMETERS	COLUMN I	COLUMN II				COLUMN III
		MAXIMUM ACCEPTABLE VALUE	FREQUENCY TO BE MONITORED				SOURCE OF REFERENCE
		mg/l (unless otherwise stated)	WATER TREATMENT PLANT OUTLET	SERVICE RESERVOIR OUTLET	DISTRIBUTION SYSTEM	WELL/ SPRING	
	GROUP IV						
1	ALDRIN/DIELDRIN	0.00003	Y/4	WN	WN	WN	WHO2
2	DDT	0.002	Y/4	WN	WN	WN	WHO2
3	HEPTACHLOR & HEPTACHLOR EPOXIDE	0.00003	Y/4	WN	WN	WN	WHO2
4	METHOXYCHLOR	0.02	Y/4	WN	WN	WN	WHO2
5	LINDANE (BHC)	0.002	Y/4	WN	WN	WN	WHO2
6	ENDOSULFAN	0.03	Y/4	WN	WN	WN	AUS
7	CHLORDANE	0.0002	WN	WN	WN	WN	WHO2
8	1,2-DICHLOROPROPANE	0.04	WN	WN	WN	WN	WHO3
9	1,3-DICHLOROPROPENE	0.02	WN	WN	WN	WN	WHO2
10	HEXACHLOROBENZENE	0.001	WN	WN	WN	WN	WHO2
11	PENTACHLOROPHENOL	0.009	WN	WN	WN	WN	WHO3
12	ALACHLOR	0.02	WN	WN	WN	WN	WHO2
13	ALDICARB	0.01	WN	WN	WN	WN	WHO2
14	AMETRYN	0.05	WN	WN	WN	WN	AUS
15	ATRAZINE	0.002	WN	WN	WN	WN	WHO2
16	BENTAZONE	0.3	WN	WN	WN	WN	WHO3
17	CARBOFURAN	0.007	WN	WN	WN	WN	WHO3
18	CHLOROTOLURON	0.03	WN	WN	WN	WN	WHO2
19	CYANAZINE	0.0006	WN	WN	WN	WN	WHO3
20	2,4-DICHLOROPHOXY-ACETIC ACID (2,4D)	0.03	WN	WN	WN	WN	WHO3
21	DIQUAT	0.01	WN	WN	WN	WN	WHO3
22	1,2-DIBROMO-3-CHLOROPROPANE	0.001	WN	WN	WN	WN	WHO2
23	1,2-DIBROMOETHANE	0.0004	WN	WN	WN	WN	WHO3
24	ISOPROTURON	0.009	WN	WN	WN	WN	WHO2
25	MCPA	0.002	WN	WN	WN	WN	WHO2
26	METOLACHLOR	0.01	WN	WN	WN	WN	WHO2
27	MOLINATE	0.006	WN	WN	WN	WN	WHO2
28	PENDIMETHALIN	0.02	WN	WN	WN	WN	WHO2
29	PERMETHRIN	0.02	WN	WN	WN	WN	WHO2
30	PROPANIL	0.02	WN	WN	WN	WN	WHO2
31	PYRIDATE	0.1	WN	WN	WN	WN	WHO2
32	SIMAZINE	0.002	WN	WN	WN	WN	WHO2
33	TRIFURALIN	0.02	WN	WN	WN	WN	WHO2
34	2,4 DB	0.09	WN	WN	WN	WN	WHO2
35	DICHLORPROP	0.1	WN	WN	WN	WN	WHO2
36	FENOPROP	0.009	WN	WN	WN	WN	WHO2
37	MECOPROP	0.01	WN	WN	WN	WN	WHO2
38	2,4,5-T	0.009	WN	WN	WN	WN	WHO2
39	TERBUTHYLAZINE	0.007	WN	WN	WN	WN	WHO3

TABLE 2 (continued)

DRINKING WATER QUALITY STANDARDS AND FREQUENCY OF MONITORING							
NO.	PARAMETERS	COLUMN I	COLUMN II				COLUMN III
		MAXIMUM ACCEPTABLE VALUE	FREQUENCY TO BE MONITORED				SOURCE OF REFERENCE
		mg/l (unless otherwise stated)	WATER TREATMENT PLANT OUTLET	SERVICE RESERVOIR OUTLET	DISTRIBUTION SYSTEM	WELL/ SPRING	
40	<u>ORGANIC SUBSTANCES:</u> CARBON TETRACHLORIDE	0.002	WN	WN	WN	WN	WHO2
41	DICHLOROMETHANE	0.02	WN	WN	WN	WN	WHO2
42	1,2-DICHLOROETHANE	0.03	WN	WN	WN	WN	WHO2
43	1,1,1-TRICHLOROETHANE	2	WN	WN	WN	WN	WHO2
44	VINYL CHLORIDE	0.005	WN	WN	WN	WN	WHO2
45	1,1-DICHLOROETHENE	0.03	WN	WN	WN	WN	WHO2
46	1,2-DICHLOROETHENE	0.05	WN	WN	WN	WN	WHO2
47	TRICHLOROETHENE	0.07	WN	WN	WN	WN	WHO2
48	TETRACHLOROETHENE	0.04	WN	WN	WN	WN	WHO2
49	BENZENE	0.01	WN	WN	WN	WN	WHO2
50	TOULENE	0.7	WN	WN	WN	WN	WHO2
51	XYLENE	0.5	WN	WN	WN	WN	WHO2
52	ETYL BENZENE	0.3	WN	WN	WN	WN	WHO2
53	STYRENE	0.02	WN	WN	WN	WN	WHO2
54	BENZO (A) PYRENE	0.0007	WN	WN	WN	WN	WHO2
55	MONOCHLOROBENZENE	0.3	WN	WN	WN	WN	WHO2
56	1,2-DICHLOROBENZENE	1	WN	WN	WN	WN	WHO2
57	1,4-DICHLOROBENZENE	0.3	WN	WN	WN	WN	WHO2
58	TRICHLOROBENZENE (TOTAL)	0.02	WN	WN	WN	WN	WHO2
59	DI (2-ETHYLHEXYL) ADIPATE	0.08	WN	WN	WN	WN	WHO2
60	DI (2-ETHYLHEXYL) PHTHALATE	0.008	WN	WN	WN	WN	WHO2
61	EDETIC ACID (EDTA)	0.6	WN	WN	WN	WN	WHO3
62	ACRYLAMIDE	0.0005	WN	WN	WN	WN	WHO2
63	EPICHLOROHYDRIN	0.0004	WN	WN	WN	WN	WHO2
64	HEXACHLOROBUTADIENE	0.0006	WN	WN	WN	WN	WHO2
65	MICROCYSTIN-LR	0.001	WN	WN	WN	WN	WHO3
66	NITRILOTRIACETIC ACID (NTA)	0.2	WN	WN	WN	WN	WHO2
67	TRIBUTYLIN OXIDE	0.002	WN	WN	WN	WN	WHO2
	GROUP V						
	<u>RADIOACTIVITY:</u>						
1	GROSS α	0.1Bq/l	WN	WN	WN	WN	WHO2
2	GROSS β	1.0Bq/l	WN	WN	WN	WN	WHO2
TOTAL	131 PARAMETERS						

- W : Indicates parameters to be monitored at least once a week.
M : Indicates parameters to be monitored at least once a month.
Y/2 : Indicates parameters to be monitored at least once in 6 months.
Y : Indicates parameters to be monitored at least once a year.
2Y : Indicates parameters to be monitored at least once in 2 years.
WN : Indicates parameters to be monitored when necessary.
WHO1 : Indicates WHO Guidelines for Drinking Water Quality 1984.
WHO2 : Indicates WHO Guidelines for Drinking Water Quality 1993/96.
WHO3 : Indicates WHO Guidelines for Drinking Water Quality Addendum to Vol.1) 1998.
MAL : Indicates values adapted for Malaysian conditions.
AUS : Indicates Australian Drinking Water Quality Guidelines, 1996.
EEC : Indicates EEC Standard Council Directive (80/778/EEC).
NZ : Indicates Drinking Water Standards for New Zealand 1995.

Notes: Any toxic substances not listed shall be deemed as not allowable in drinking water.

TABLE 3

PARAMETER LIMITS FOR SEWAGE AND INDUSTRIAL EFFLUENTS

PARAMETER		UNIT	STANDARD*	
			A	B
(1)	(2)	(3)	(4)	
(i)	Temperature	°C	40	40
(ii)	pH	-	6.0 – 9.0	5.5 – 9.0
(iii)	BOD ₅ at 20°C	mg/l	20	50
(iv)	COD	mg/l	50	100
(v)	Suspended Solids (SS)	mg/l	50	100
(vi)	Mercury	mg/l	0.005	0.05
(vii)	Cadmium	mg/l	0.01	0.02
(viii)	Chromium Hexavalent	mg/l	0.05	0.05
(ix)	Arsenic	mg/l	0.05	0.1
(x)	Cyanide	mg/l	0.05	0.1
(xi)	Lead	mg/l	0.1	0.5
(xii)	Chromium, Trivalent	mg/l	0.2	1
(xiii)	Copper	mg/l	0.2	1
(xiv)	Manganese	mg/l	0.2	1
(xv)	Nickel	mg/l	0.2	1
(xvi)	Tin	mg/l	0.2	1
(xvii)	Zinc	mg/l	1	1
(xviii)	Boron	mg/l	1	4
(xix)	Iron (Fe)	mg/l	1	5
(xx)	Phenol	mg/l	0.001	1
(xxi)	Free Chlorine	mg/l	1	2
(xxii)	Sulphide	mg/l	0.5	0.5
(xxiii)	Oil and Grease	mg/l	Not detectable	10

Notes:

- * A : Discharge upstream of water supply sources.
 B : Discharge downstream of water supply sources.

Source:

Environmental Quality (Sewage & Industrial Effluent) Regulations 1979.

TABLE 4

**PARAMETER LIMITS FOR WATERCOURSE DISCHARGE OF EFFLUENT
FROM PRESCRIBED PREMISES OCCUPIED OR USED FOR THE PRODUCTION
OF PALM OIL OR ITS ASSOCIATED PRODUCTS**

PARAMETERS	LIMITS OF DISCHARGE FOR PERIOD 1-1-1984 AND THEREAFTER
Biochemical Oxygen Demand (BOD) – 3 days, 30°C; mg/l	100
Chemical Oxygen Demand (COD); mg/l	-
Total Solids; mg/l	-
Suspended Solids; mg/l	400
Oil and Grease; mg/l	50
Ammoniacal Nitrogen; mg/l	150*
Total Nitrogen; mg/l	200*
pH	5.0 – 9.0
Temperature; °C	45

Notes:

* Value of filtered sample.

Source:

Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations, 1977 Second Schedule.

TABLE 5

**PARAMETER LIMITS FOR WATERCOURSE DISCHARGE OF EFFLUENT
FROM PRESCRIBED PREMISES OCCUPIED OR USED FOR THE PRODUCTION
OF PALM OIL OR ITS ASSOCIATED PRODUCTS**

PARAMETERS	LIMITS OF DISCHARGE FOR PERIOD 1-4-1983 AND THEREAFTER
Biochemical Oxygen Demand (BOD) – 3 days, 30°C; mg/l	100 (50*)
Chemical Oxygen Demand (COD); mg/l	400
Total Solids; mg/l	-
Suspended Solids; mg/l	150 (100*)
Ammoniacal Nitrogen; mg/l	300
Total Nitrogen; mg/l	300
pH	6.0 – 9.0

Notes:

* This additional limit is the arithmetic mean value determined on the basis of a minimum of four samples taken at least once a week for four weeks consecutively.

Source:

Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations 1978 Third Schedule.

TABLE 6

**PARAMETER LIMITS FOR WATERCOURSE DISCHARGE OF EFFLUENT
FROM PRESCRIBED PREMISES OCCUPIED OR USED FOR THE PRODUCTION
OF PALM OIL OR ITS ASSOCIATED PRODUCTS**

PARAMETERS	LIMITS OF DISCHARGE FOR PERIOD 1-4-1981 AND THEREAFTER
Biochemical Oxygen Demand (BOD) – 3 days, 30°C; mg/l	100 (50*)
Chemical Oxygen Demand (COD); mg/l	250
Total Solids; mg/l	-
Suspended Solids; mg/l	150 (100*)
Ammoniacal Nitrogen; mg/l	40 [#]
Total Nitrogen; mg/l	60 [#]
pH	6.0 – 9.0

Notes:

* This additional limit is the arithmetic mean value determined on the basis of a minimum of four samples taken at least once a week for four weeks consecutively.

Value on filtered sample.

Source:

Environmental Quality (Prescribed Premises) (Raw Natural Rubber) Regulations 1978 Fourth Schedule.