

Appendix 4A

Action Levels for Soil Remediation

**R06100 - EIA for Decommissioning of Cheoy Lee Shipyard
Land Contamination - Action Levels for Soil Remediation**

Action Levels for Soil Remediation

Item	Parameter	CAS No.	Valule (mg/kg)	Reference Standard
1	Carbon Chain C6-C10	DMO-710-018		
	Carbon Chain C11-C14	DMO-710-001		
	Carbon Chain C15-C18	DMO-710-003		
	Carbon Chain C19-C22	DMO-710-005	1000 (total)	Dutch 'B' Standards
	Carbon Chain C23-C26	DMO-710-007		
	Carbon Chain C27-C30	DMO-710-009		
	Carbon Chain C31-C36	DMO-710-010		
2	Mercury	7439-97-6	2	Dutch 'B' Standards
3	Arsenic	7440-38-2	30	Dutch 'B' Standards
4	Barium	7440-39-3	400	Dutch 'B' Standards
5	Cadmium	7440-43-9	5	Dutch 'B' Standards
6	Chromium (total)	7440-47-3	250	Dutch 'B' Standards
7	Cobalt	7440-48-4	50	Dutch 'B' Standards
8	Copper	7440-50-8	100	Dutch 'B' Standards
9	Lead	7439-92-1	150	Dutch 'B' Standards
10	Nickel	7440-02-0	100	Dutch 'B' Standards
11	Molybdenum	7439-98-7	40	Dutch 'B' Standards
12	Tin	7440-31-5	50	Dutch 'B' Standards
13	Zinc	7440-66-6	500	Dutch 'B' Standards
14	Cyanide (total)	57-12-5	50	Dutch 'B' Standards
15	Benzene	71-43-2	0.5	Dutch 'B' Standards
16	Ethylbenzene	100-41-4	5	Dutch 'B' Standards
17	Toluene	108-88-3	3	Dutch 'B' Standards
18	Total Xylenes	1330-20-7	5	Dutch 'B' Standards
19	Phenol	108-95-2	1	Dutch 'B' Standards
20	Styrene	100-42-5	5	Dutch 'B' Standards
21	Pyridine	110-86-1	2	Dutch 'B' Standards
22	alpha-BHC	319-84-6	0.5	Dutch 'B' Standards
23	beta-BHC	319-85-7	0.5	Dutch 'B' Standards
24	delta-BHC	319-86-8	0.5	Dutch 'B' Standards
25	gamma-BHC (Lindane)	58-89-9	0.5	Dutch 'B' Standards
26	Heptachlor	76-44-8	0.5	Dutch 'B' Standards
27	Aldrin	309-00-2	0.5	Dutch 'B' Standards
28	Heptachlor epoxide	1024-57-3	0.5	Dutch 'B' Standards

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29	Endosulfan I	959-98-8	0.5	Dutch 'B' Standards
30	Dieldrin	60-57-1	0.5	Dutch 'B' Standards
31	4,4-DDE	72-55-9	0.5	Dutch 'B' Standards
32	4,4-DDD	72-54-8	0.5	Dutch 'B' Standards
33	Endrin	72-20-8	0.5	Dutch 'B' Standards
34	Endosulfan II	33213-65-9	0.5	Dutch 'B' Standards
35	Endosulfan sulfate	1031-07-8	0.5	Dutch 'B' Standards
36	4,4-DDT	50-29-3	0.5	Dutch 'B' Standards
37	Methoxychlor	72-43-5	0.5	Dutch 'B' Standards
38	Endrin ketone	53494-70-5	0.5	Dutch 'B' Standards
39	Endrin aldehyde	7421-93-4	0.5	Dutch 'B' Standards
40	gamma-Chlordane	12789-03-6	0.5	Dutch 'B' Standards
41	alpha-Chlordane	5103-71-9	0.5	Dutch 'B' Standards
42	Toxaphene	8001-35-2	2	Dutch 'B' Standards
43	Naphthalene	91-20-3	5	Dutch 'B' Standards
44	Anthracene	120-12-7	10	Dutch 'B' Standards
45	Fluoranthene	206-44-0	10	Dutch 'B' Standards
46	Pyrene	129-00-0	10	Dutch 'B' Standards
47	Benzo(a)pyrene	50-32-8	1	Dutch 'B' Standards
48	Aroclor-1016	12674-11-2		
	Aroclor-1221	11104-28-2		
	Aroclor-1232	11141-16-5		
	Aroclor-1242	53469-21-9		
	Aroclor-1248	12672-29-6	1 (total)	Dutch 'B' Standards
	Aroclor-1254	11097-69-1		
	Aroclor-1260	11096-82-5		
	Aroclor-1262	37324-23-5		
49	Dichlorodifluoromethane	75-71-8	94	USEPA Region IX Standards: PRGs
50	Chloromethane	74-87-3	1.2	USEPA Region IX Standards: PRGs
51	Vinyl chloride	75-01-4	0.03	USEPA Federal Standards: SSLs
52	Bromomethane (Methyl bromide)	74-83-9	10	USEPA Federal Standards: SSLs
53	Chloroethane	75-00-3	3	USEPA Region IX Standards: PRGs
54	Trichlorofluoromethane	75-69-4	390	USEPA Region IX Standards: PRGs
55	Acetone	67-64-1	7800	USEPA Federal Standards: SSLs
56	Carbon Disulfide	75-15-0	720	USEPA Federal Standards: SSLs

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57	Methylene chloride	75-09-2	13	USEPA Federal Standards: SSLs
58	1,1-Dichloroethane	75-34-3	1300	USEPA Federal Standards: SSLs
59	Chloroform	67-66-3	0.3	USEPA Federal Standards: SSLs
60	1,1,1-Trichloroethane	71-55-6	1200	USEPA Federal Standards: SSLs
61	Carbon Tetrachloride	56-23-5	0.3	USEPA Federal Standards: SSLs
62	1,2-Dichloroethane	107-06-2	0.4	USEPA Federal Standards: SSLs
63	1,2-Dichloropropane	78-87-5	9	USEPA Federal Standards: SSLs
64	Bromodichloromethane	75-27-4	10	USEPA Federal Standards: SSLs
65	Chlorobenzene	108-90-7	130	USEPA Federal Standards: SSLs
66	Bromoform	75-25-2	53	USEPA Federal Standards: SSLs
67	1,1,2,2-Tetrachloroethane	79-34-5	0.6	USEPA Federal Standards: SSLs
68	1,3-Dichlorobenzene	541-73-1	130	USEPA Region IX Standards: PRGs
69	1,4-Dichlorobenzene	106-46-7	3.4	USEPA Region IX Standards: PRGs
70	1,2-Dichlorobenzene	95-50-1	560	USEPA Federal Standards: SSLs
71	1,2-Dibromo-3-chloropropane	96-12-8	0.45	USEPA Region IX Standards: PRGs
72	1,2-Dibromoethane	106-93-4	0.0069	USEPA Region IX Standards: PRGs
73	Dibromochloromethane	124-48-1	8	USEPA Federal Standards: SSLs
74	Bromobenzene	108-86-1	28	USEPA Region IX Standards: PRGs
75	n-Butylbenzene	104-51-8	140	USEPA Region IX Standards: PRGs
76	Sec-Butylbenzene	135-98-8	110	USEPA Region IX Standards: PRGs
77	Tert-Butylbenzene	98-06-6	130	USEPA Region IX Standards: PRGs
78	Isopropylbenzene	98-82-8	160	USEPA Region IX Standards: PRGs
79	n-Propylbenzene	103-65-1	140	USEPA Region IX Standards: PRGs
80	1,1,1,2-Tetrachloroethane	630-20-6	3	USEPA Region IX Standards: PRGs
81	1,2,4-Trichlorobenzene	120-82-1	780	USEPA Federal Standards: SSLs
82	1,1,2-Trichloroethane	79-00-5	1	USEPA Federal Standards: SSLs
83	1,2,3-Trichloropropane	96-18-4	0.0014	USEPA Region IX Standards: PRGs
84	1,2,4-Trimethylbenzene	95-63-6	52	USEPA Region IX Standards: PRGs
85	1,3,5-Trimethylbenzene	108-67-8	21	USEPA Region IX Standards: PRGs
86	Vinyl Acetate	108-05-4	1000	USEPA Federal Standards: SSLs
87	N-Nitrosodimethylamine	62-75-9	0.0095	USEPA Region IX Standards: PRGs

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88	Bis(2-chloroethyl) ether	111-44-4	0.2	USEPA Federal Standards: SSLs
89	2-Chlorophenol	95-57-8	390	USEPA Federal Standards: SSLs
90	1,3-Dichlorobenzene	541-73-1	13	USEPA Region IX Standards: PRGs
91	1,4-Dichlorobenzene	106-46-7	27	USEPA Federal Standards: SSLs
92	Benzyl alcohol	100-51-6	18000	USEPA Region IX Standards: PRGs
93	1,2-Dichlorobenzene	95-50-1	370	USEPA Region IX Standards: PRGs
94	2-Methylphenol	95-48-7	3900	USEPA Federal Standards: SSLs
95	N-Nitroso-di-n-propylamine	621-64-7	0.09	USEPA Federal Standards: SSLs
96	Nitrobenzene	98-95-3	39	USEPA Federal Standards: SSLs
97	Isophorone	78-59-1	670	USEPA Federal Standards: SSLs
98	2,4-Dimethylphenol	105-67-9	1600	USEPA Federal Standards: SSLs
99	Benzoic acid	65-85-0	310000	USEPA Federal Standards: SSLs
100	2,4-Dichlorophenol	120-83-2	230	USEPA Federal Standards: SSLs
101	1,2,4-Trichlorobenzene	120-82-1	650	USEPA Region IX Standards: PRGs
102	Hexachlorocyclopentadiene	77-47-4	10	USEPA Federal Standards: SSLs
103	2,4,6-Trichlorophenol	88-06-2	58	USEPA Federal Standards: SSLs
104	2,4,5-Trichlorophenol	95-95-4	7800	USEPA Federal Standards: SSLs
105	2-Nitroaniline	88-74-4	3.5	USEPA Region IX Standards: PRGs
106	Hexachlorobenzene	118-74-1	0.4	USEPA Federal Standards: SSLs
107	Pentachlorophenol	87-86-5	3	USEPA Federal Standards: SSLs
108	Di-n-butylphthalate	84-74-2	2300	USEPA Federal Standards: SSLs
109	Butylbenzylphthalate	85-68-7	930	USEPA Federal Standards: SSLs
110	3,3-Dichlorobenzidine	91-94-1	1	USEPA Federal Standards: SSLs
111	Benzo(a)anthracene	56-55-3	0.9	USEPA Federal Standards: SSLs
112	Chrysene	218-01-9	88	USEPA Federal Standards: SSLs
113	Bis(2-ethylhexyl)phthalate	117-81-7	46	USEPA Federal Standards: SSLs
114	Di-n-octylphthalate	117-84-0	1600	USEPA Federal Standards: SSLs
115	Benzo(b)fluoranthene	205-99-2	0.9	USEPA Federal Standards: SSLs
116	Dimethylphthalate	131-11-3	100000	USEPA Region IX Standards: PRGs
117	Acenaphthene	83-32-9	4700	USEPA Federal Standards: SSLs
118	2,4-Dinitrotoluene	121-14-2	0.9	USEPA Federal Standards: SSLs

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119	2,6-Dinitrotoluene	606-20-2	0.9	USEPA Federal Standards: SSLs
120	Diethylphthalate	84-66-2	2000	USEPA Federal Standards: SSLs
121	Fluorene	86-73-7	3100	USEPA Federal Standards: SSLs
122	N-Nitrosodiphenylamine	86-30-6	130	USEPA Federal Standards: SSLs
123	Benzo(k)fluoranthene	207-08-9	9	USEPA Federal Standards: SSLs
124	Indeno(1,2,3-cd)pyrene	193-39-5	0.9	USEPA Federal Standards: SSLs
125	Dibenz(a,h)anthracene	53-70-3	0.09	USEPA Federal Standards: SSLs
126	Azobenzene	103-33-3	4.4	USEPA Region IX Standards: PRGs
127	Aniline	62-53-3	85	USEPA Region IX Standards: PRGs
128	2,4-Dinitrophenol	51-28-5	160	USEPA Federal Standards: SSLs
129	4-Nitrophenol	100-02-7	490	USEPA Region IX Standards: PRGs
130	Dibenzofuran	132-64-9	290	USEPA Region IX Standards: PRGs
131	Benzdine	92-87-5	0.0021	USEPA Region IX Standards: PRGs
132	Trichloroethene	79-01-6	5	USEPA Federal Standards: SSLs
133	4-Chloroaniline (p-Chloroaniline)	106-47-8	310	USEPA Federal Standards: SSLs
134	1,1-Dichloroethene	75-35-4	0.07	USEPA Federal Standards: SSLs
135	cis-1,2-Dichloroethene	156-59-2	780	USEPA Federal Standards: SSLs
136	trans-1,2-Dichloroethene	156-60-5	1600	USEPA Federal Standards: SSLs
137	Hexachloro-1,3-butadiene	87-68-3	8	USEPA Federal Standards: SSLs
138	Tetrachloroethene	127-18-4	11	USEPA Federal Standards: SSLs
139	Antimony	7440-36-0	31	USEPA Federal Standards: SSLs
140	Beryllium	7440-41-7	0.1	USEPA Federal Standards: SSLs
141	Hexavalent Chromium	18540-29-9	270	USEPA Federal Standards: SSLs
142	Selenium	7782-49-2	390	USEPA Federal Standards: SSLs
143	Silver	7440-22-4	390	USEPA Federal Standards: SSLs
144	Thallium	7446-18-6	5.2	USEPA Region IX Standards: PRGs
145	Vanadium	7440-62-2	550	USEPA Federal Standards: SSLs
146	Tributyltin (TBT)		7,000 µg Sn/kg (See Remark 1)	USEPA Region IX Standards: PRGs
147	Dioxin (2,3,7,8-TCDD equivalent)	1746-01-6	0.001	USEPA OSWER Directive 9200.4-

Remarks:

1 This value is derived from the USEPA Region IX's PRG for Tributyltin oxide.