



Oregon

Theodore Kulongoski, Governor

Department of Environmental Quality

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November 16, 2007

Water Quality Staff

Re: Addendum to Reasonable Potential IMD to revise Quantitation Limits

The Surface Water Management section is in the process of updating the ***Reasonable Potential Analysis Internal Management Directive*** (RPA IMD) but due to concerns with inaccuracies in the current tables presented in ***Appendix B: Non-detect Analytical Data and Minimum Practical Quantification Levels***, we are issuing revised tables for immediate use. The tables contained in the appendix are designed to guide NPDES permit writers in determining acceptable quantitation limits and detection levels for analytic samples collected as part of the permit development process and/or routine monitoring requirements.

The revised tables are the result of a survey of the state's analytical laboratories that typically process water samples for water quality analyses. The survey was designed to determine the water quality parameters and test methods offered by the analytical laboratories, and the corresponding quantitation limits (QL). Using the survey results, a panel of analytic chemists then selected a quantitation limit for each parameter that should be readily achievable by most laboratories in the State.

The revised tables are entitled **[Revised RPA IMD, Appendix B Quantitation Limits Tables, November 2007](#)** and are temporarily located on the *Permit Writers Corner* until the final RPA IMD is revised., The tables are organized by chemical family and also possess current water quality criteria information for ready comparison.

In the fourth column from the left, the department has identified analytic methods from **[40 CFR 136.3](#)** that are approved by EPA for the corresponding wastewater parameter and typically can meet the QL listed in the table. Only analytic methods listed in 40 CFR 136.3, approved "alternative methods" per 40 CFR 136.4 or approved "modified methods" per 40 CFR 136.6 may be used for wastewater monitoring purposes. Permittees may use the other methods previously described as long as they are at or below applicable permitted effluent limits, water quality criteria or listed QL. Please consult with the DEQ Laboratory (Organic Analytical Section Manager) to ensure method equivalency. The department has also listed preferred analytic methods for "state only" water quality parameters that do not require 40 CFR 136.3 methods.

The next eight columns are a summary of the state's various water quality criteria and the priority pollutant status. The final column is the "Quantitation Limit". Please note that all water quality criteria below the QL have been highlighted.

Whenever possible, a permittee should always use a test method with a QL that is lower than the applicable permitted effluent limit or water quality criteria for priority pollutant scans. All analysis reports must contain both the QL and detection level of the method as defined below:

Detection Level: Same as the “Method Detection Limit” (MDL) derived using 40 CFR 136 Appendix B ([40 CFR 136, Appendix B](#)).

Quantitation Limit: Same as the Method Reporting Limit (MRL). It is the lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

The permit writer should include the following requirements in the permit:

1. The permittee is required to analyze wastewater samples using the one of the test methods indicated in 40 CFR 136.3 or an approved alternative under 40 CFR 136.4 or 136.6.
2. Whenever possible, the test methods used should have QLs less than or equal to that listed in. **Revised RPA IMD, Appendix B Quantitation Limits Tables, November 2007.**
3. The permit writer should specifically indicate corresponding QL for required effluent limits in the permit.

Please note that these revised tables will be included in the next revision of the RPA IMD, along with updated QL use information. Until then, please refer to the present version of the RPA IMD, Appendix B for guidance on the use of QLs and refer any questions to Spencer Bohaboy or Mike Wiltsey at the contact information below.

Spencer Bohaboy: 503-229-5415 Mike Wiltsey: 503-229-5047

Below is some suggested language for use in permits:

- *Whenever possible, a permittee should use a test method, as indicated in [40 CFR 136.3](#), with a Quantitation Limit (QL) that is lower than the permitted effluent limit or water quality criteria for priority pollutant scans. A list of the analytic methods approved by the department and the applicable QLs are located in the document **Revised RPA IMD, Appendix B Quantitation Limits Tables, November 2007** located on the web at <http://www.deq.state.or.us/wq/pubs/imds/rpaammend.pdf>. The permittee must ensure that all monitoring analysis reports contain both the QL and detection level of the method as defined below:*
 - **Detection Level:** Same as the “Method Detection Limit” (MDL) derived using 40 CFR 136 Appendix B ([40 CFR 136, Appendix B](#)).
 - **Quantitation Limit:** Same as the Method Reporting Limit (MRL). It is the lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

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- *When-ever possible, analysis for water quality parameters with effluent limits should possess minimum QLs as described below:*
 - *Silver* *1 µg/l*
 - *Chlorine* *100 µg/l*
 - *Arsenic* *0.05 µg/l*

Thank you,

Spencer Bohaboy
Policy Development Specialist
Surface Water Management
Oregon Department of Environmental Quality
503-229-5415

Revised RPA IMD, Appendix B Quantitative Limits Tables
Semi-Vols

EPA No.	Compound	CAS Number	Preferred Method	Freshwater Criteria		Saltwater Criteria		Human Health: Consumption of		Drinking Water M.C.L. (ug/l)	Priority Pollutants	Quantitation Limit (ug/l)
				Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Water + Organism (ug/l)	Organism only (ug/l)			
Polyaromatic Hydrocarbons												
16	Acenaphthene	83329	625*					670	990		y	1**
57	Acenaphthylene	208968	625*								y	1**
58	Anthracene	120127	625*					8300	40000		y	1**
60	Benzo(a)Anthracene	56553	625*					0.0038	0.018		y	1**
61	Benzo(a)Pyrene	50328	625*					0.0038	0.018		y	1**
62	Benzo(b)Fluoranthene	205992	625*					0.0038	0.018			1**
63	Benzo(g,h,i)Perylene	191242	625*								y	1**
64	Benzo(k)Fluoranthene	207089	625*								y	1**
73	Chrysene	218019	625*					0.0038	0.018		y	1**
74	Dibenzo(a,h)Anthracene	53703	625*					0.0038	0.018		y	1**
86	Fluoranthene	206440	625*					42	54		y	2**
87	Fluorene	86737	625*					1100	5300		y	1**
92	Ideno1,2,3-(cd)Pyrene	193395	625*					0.0038	0.018		y	1**
94	Naphthalene	91203	625*								y	1**
99	Phenanthrene	85018	625*								y	1**
100	Pyrene	129000	625*					830	4000			1**
Phthalate esters												
70	Butylbenzyl Phthalate	85687	625*					1500	1900		y	1
79	Diethylphthalate	84662	625*					17000	44000		y	1
80	Dimethyl Phthalate	131113	625*					270000	1100000		y	1
81	Di-n-Butyl Phthalate	84742	625*					2000	4500		y	1
84	Di-n-Octyl Phthalate	117840	625*								y	1
68	EthylhexylPhthalate Bis2-	117817	625*					1.2	2.2			1
BNA SVOC												
59	Benzidine	92875	625*					0.000086	0.0002		y	10
69	Bromophenyl Phenyl Ether 4-	101553	625*								y	1
65	ChloroethoxyMethane Bis2-	111911	8270/625									2
66	ChloroethylEther Bis2-	111444	625*					0.03	0.53			1
67	ChloroisopropylEther Bis2-	108601	625*					34.7	4.36			2
71	Chloronaphthalene 2-	91587	625*					1000	1600		y	1
45	Chlorophenol 2-	95578	625*					81	150		y	1
72	Chlorophenyl Phenyl Ether 4-	7005723	625*								y	1
78	Dichlorobenzidine 3,3'-	91941	625*					0.021	0.028		y	1
46	Dichlorophenol 2,4-	120832	625*					77	290		y	1
47	Dimethylphenol 2,4-	105679	625*					380	850		y	2
27 N	Dinitrophenols	25550587	625*					69	5300			Contact DEQ Lab
49	Dinitrophenol 2,4-	51285	625*					69	5300		y	5

Revised RPA IMD, Appendix B Quantitative Limits Tables
Semi-Vols

EPA No.	Compound	CAS Number	Preferred Method	Freshwater Criteria		Saltwater Criteria		Human Health: Consumption of		Drinking Water M.C.L. (ug/l)	Priority Pollutants	Quantitation Limit (ug/l)
				Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Water + Organism (ug/l)	Organism only (ug/l)			
82	Dinitrotoluene 2,4-	121142	625*					0.11	3.4		y	1
83	Dinitrotoluene 2,6-	606202	625*								y	1
85	Diphenylhydrazine 1,2-	122667	8270					0.036	0.2		y	5
88	Hexachlorobenzene	118741	625*					0.00028	0.00029		y	1
89	Hexachlorobutadiene	87683	625*					0.44	18		y	2
90	Hexachlorocyclopentadiene	77474	625*					40	1100		y	2
91	Hexachloroethane	67721	625*					1.4	3.3		y	2
48	Methyl-4,6-Dinitrophenol 2-	534521	625*					13	280			2
52	Methyl-4-Chlorophenol 3-	59507	8270/625									1
95	Nitrobenzene	98953	625*					17	690		y	1
50	Nitrophenol 2-	88755	625*								y	2
51	Nitrophenol 4-	100027	625*								y	5
96	N-Nitrosodimethylamine	62759	625*					0.00069	3		y	1
97	N-Nitrosodi-n-Propylamine	621647	625*					0.005	0.51		y	2
98	N-Nitrosodiphenylamine	86306	625*					3.3	6		y	1
34 N	Pentachlorobenzene	608935	GC/MS					1.4	1.5			10 / Contact DEQ Lab
53	Pentachlorophenol	87865	625*			13	7.9	0.27	3		y	2
54	Phenol	108952	625*					3500	1700000		y	1
	Tetrachlorophenol 2,3,5,6	935955	8270/625									2
45 N	Trichlorophenol 2,4,5	95954	GC/MS					1800	3600			2 / Contact DEQ Lab
55	Trichlorophenol 2,4,6-	88062	625*					1.2	2.4		y	1
43 N	Tetrachlorobenzene,1,2,4,5	95943	625*				0.97	1.1				1
Pesticides												
102	Aldrin	309002	608	3		1.3		0.000049	0.00005			0.01
103	BHC alpha-	319846	608					0.0026	0.0049			0.01
104	BHC beta-	319857	608					0.0091	0.017			0.01
106	BHC delta-	319868	8081/608									0.01
105	BHC gamma- (Lindane)	58899	608	0.95	0.08	0.16				0.004mg		0.01
107	Chlordane	57749	608	2.4	0.0043	0.09	0.004	0.00046	0.00048			0.1
12 N	Chlorpyrifos	2921882	8081/608	0.083	0.041	0.011	0.0056					0.01
110	DDD 4,4'-	72548	608					0.00031	0.00031			0.01
109	DDE 4,4'-	72559	608					0.00022	0.00022			0.01
108	DDT 4,4'-	50293	608	1.1	0.001	0.13	0.001					0.01
111	Dieldrin	60571	608	0.24	0.0019	0.71	0.0019	0.000052	0.000054			0.01
112	Endosulfan alpha-	959988	608	0.22	0.056	0.034	0.0087	62	89			0.01
113	Endosulfan beta-	33213659	608	0.22	0.056	0.034	0.0087	62	89			0.01
114	Endosulfan Sulfate	1031078	608					62	89			0.01

Revised RPA IMD, Appendix B Quantitative Limits Tables
Semi-Vols

EPA No.	Compound	CAS Number	Preferred Method	Freshwater Criteria		Saltwater Criteria		Human Health: Consumption of		Drinking Water M.C.L. (ug/l)	Priority Pollutants	Quantitation Limit (ug/l)
				Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Water + Organism (ug/l)	Organism only (ug/l)			
115	Endrin	72208	608	0.086	0.0023	0.037	0.0023	0.059	0.06	0.0002mg		0.01
116	Endrin Aldehyde	7421934	608					0.29	0.3			0.01
117	Heptachlor	76448	608	0.52	0.0038	0.053	0.0036	0.000079	0.000079			0.01
118	Heptachlor Epoxide	1024573	608	0.52	0.0038	0.053	0.0036	0.000039	0.000039			0.01
93	Isophorone	78591	625*					35	960		y	10
23 N	Methoxychlor	72435	608		0.03		0.03	100		0.1mg		0.01
120	Toxaphene	8001352	608	0.73	0.0002	0.21	0.0002	0.00028	0.00028	0.005mg		0.5
PCB/PBDE												
	PBDE, 47		8270/8081									Contact DEQ Lab
	PBDE, 99		8270/8081									Contact DEQ Lab
	PBDE, 100		8270/8081									Contact DEQ Lab
	PBDE, 153		8270/8081									Contact DEQ Lab
	PBDE, 154		8270/8081									Contact DEQ Lab
	PCB, Arochlor 1016		608	2	0.014	10	0.03	0.000064	0.000064			0.5
	PCB, Arochlor 1221		608	2	0.014	10	0.03	0.000064	0.000064			0.5
	PCB, Arochlor 1232		608	2	0.014	10	0.03	0.000064	0.000064			0.5
	PCB, Arochlor 1242		608	2	0.014	10	0.03	0.000064	0.000064			0.5
	PCB, Arochlor 1248		608	2	0.014	10	0.03	0.000064	0.000064			0.5
	PCB, Arochlor 1254		608	2	0.014	10	0.03	0.000064	0.000064			0.5
	PCB, Arochlor 1260		608	2	0.014	10	0.03	0.000064	0.000064			0.5
	PCB, Arochlor 1263		8082/608	2	0.014	10	0.03	0.000064	0.000064			0.5
	PCB, Arochlor 1268		608	2	0.014	10	0.03	0.000064	0.000064			0.5
Herbicides												
10 N	Chlorophenoxy Herbicide (2,4,5,-TP)	93721	8151					10				1
11 N	Chlorophenoxy Herbicide (2,4-D)	94757	8151					100				1
OP compounds												
14 N	Demeton	8065483	8141/8270		0.1		0.1					1
	Diazinon	333415	8141									1
17 N	Guthion	86500	8141/8270		0.01		0.01					1

Values shaded in blue are criteria below quantitation limit

The values reflected are the current water quality criteria from Tables 20 and 33A. Additional criteria (Table 33a red and 33b) might take effect as EPA approves them.

* Please reference EPA's **Solutions for Analytical Chemistry Problems with Clean Water Methods, March 2007** (<http://www.epa.gov/waterscience/methods/files/pumpkin.pdf>) for allowable changes for methods to achieve the listed QL.

** If lab can not meet using full scan (625), please contact DEQ Lab

Revised RPA IMD, Appendix B Quantitative Limits Tables
Volatiles

EPA No.	Compound	CAS Number	Preferred Method	Freshwater Criteria		Saltwater Criteria		Human Health: Consumption of		Drinking Water M.C.L.	Priority Pollutants	Quantitation Limit (ug/l)
				Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Water + Organism (ug/l)	Organism only (ug/l)			
17	Acrolein	107028	624/603					190	290		y	5
16	Acrylonitrile	107131	624/603					0.051	0.25		y	5
19	Benzene	71432	624					0.66	40		y	0.5
20	Bromoform	75252	624					4.3	140		y	0.5
21	Carbon Tetrachloride	56235	624					0.23	1.6		y	0.5
22	Chlorobenzene	108907	624 / 624					130	1600		y	0.5
23	Chlorodibromomethane	124481	624					0.4	13		y	0.5
24	Chloroethane	75003	624								y	0.5
25	Chloroethylvinyl Ether 2-	110758	624								y	5
26	Chloroform	67663	624					0.19	15.7		y	0.5
15 N	ChloromethylEther, Bis	542881	624/8260					3.76 E-9	0.00029			Contact DEQ Lab
75	Dichlorobenzene 1,2-	95501	624/602				420	1300				0.5
76	Dichlorobenzene 1,3-	541731	624/602				320	960				0.5
77	Dichlorobenzene 1,4-	106467	624/602				63	190				0.5
27	Dichlorobromomethane	75274	624/8260					0.55	17		y	0.5
28	Dichloroethane 1,1-	75343	624								y	0.5
29	Dichloroethane 1,2-	107062	624					0.38	37		y	0.5
30	Dichloroethylene 1,1-	75354	624/8260					330	7100		y	0.5
31	Dichloropropane 1,2-	78875	624					0.5	15		y	0.5
32	Dichloropropene 1,3-	542756	624					0.34	21			0.5
33	Ethylbenzene	100414	624					530	2100			0.5
34	Methyl Bromide	74839	625/8270					47	1500			0.5
35	Methyl Chloride	74873	625/8271									0.5
36	Methylene Chloride	75092	624					4.6	590		y	0.5
37	Tetrachloroethane 1,1,2,2-	79345	624					0.17	4		y	0.5
38	Tetrachloroethylene	127184	624					0.69	3.3		y	0.5
39	Toluene	108883	624					1300	15000		y	0.5
40	Trans-Dichloroethylene 1,2-	156605	624					140	10000		y	0.5
101	Trichlorobenzene 1,2,4-	120821	625					35	70		y	0.5
41	Trichloroethane 1,1,1-	71556	624					18400	1.03 E6		y	0.5
42	Trichloroethane 1,1,2-	79005	624					0.59	16		y	0.5
43	Trichloroethylene	79016	624/8260					2.5	30		y	0.5
44	Vinyl Chloride	75014	624					0.025	2.4		y	0.5

Values shaded in blue are criteria below quantitation limit

The values reflected are the current water quality criteria from Tables 20 and 33A. Additional criteria (Table 33a red and 33b) might take effect as EPA approves them.

Revised RPA IMD, Appendix B Quantitative Limits Tables
Metals

EPA No.	Compound	CAS Number	Preferred Method	Freshwater Criteria		Saltwater Criteria		Human Health: Consumption of		Drinking Water M.C.L.	Priority Pollutant	Quantitation Limit (ug/l)
				Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Water + Organism (ug/l)	Organism only (ug/l except as noted)			
2 N	Aluminum (pH 6.5 - 9.0)	7429905	200.8 / SM 3113									50
16	Antimony	7440360	200.8 / SM 3113					5.6	640		y	0.1
2	Arsenic	7440382	200.8 / SM 3113					0.0022	0.0175	0.05mg	y	0.05
	Arsenic (III)		200.8 / SM 3113	360	190	69	36				y	50
	Arsenic (V)		200.8 / SM 3113								y	50
6 N	Barium	7440393	200.8 / SM 3113					1000		1.0mg		0.1
3	Beryllium	7440417	200.8 / SM 3113					0.0068	0.117		y	0.1
7 N	Boron	7440428	200.7									0.5
4	Cadmium	7440439	200.8 / SM 3113	3.9	1.1	43	9.3	10		0.010mg	y	0.1
	Chromium	7440473	200.8 / SM 3113								y	0.4
5a	Chromium (III)	16065831	200.7/200.8	1700	210	1100	50	170,000	3.433 E6	0.05mg		10
5b	Chromium (VI)	18540299	218.6 / SM 3500	16	11	1100	50	50		0.05mg		10
6	Copper	7440508	200.8 / SM 3113	18	12	2.9	2.9	1300			y	10
20 N	Iron	7439896	200.8 / SM 3113		1,000			300				100
7	Lead	7439921	200.8 / SM 3113	82	3.2	140	5.6	50		0.05mg	y	5
22 N	Manganese	7439965	200.8 / SM 3113					50	100			2
8a	Mercury**	7439976	245.7 / 1631E / *	2.4	0.012	2.1	0.025	0.144	0.146	0.002mg	y	0.01
8b	Methylmercury **	22967926	1630						300 ug/kg	300 ug/kg L		0.00005
9	Nickel	7440020	200.8 / SM 3113	1400	160	75	8.3	134	100		y	10
10	Selenium	7782492	200.8 / SM 3113					10	4200	0.01mg	y	2
11	Silver	7440224	200.8 / SM 3113	4.1	0.12	2.7		50		0.05mg	y	1
12	Thallium	7440280	200.8					0.24	0.47		y	0.1
44 N	Tributyltin (TBT)	688733	GC/MS	0.46	0.063	0.37	0.01					Contact DEQ Lab
13	Zinc	7440666	200.8	120	110	95	86	7400	26000		y	5

All metals are in terms of "Total Recoverable"

The values reflected are the current water quality criteria from Tables 20 and 33A.

Values shaded in blue are criteria below quantitation limit

Values shaded in yellow are hardness dependant and not final criteria

* For mercury, the City of Portland Environmental Lab is permitted to use method 200.8 as an approved alternative method for wastewater monitoring.

** For sources in the Willamette Basin, the permit writer should contact the TMDL basin coordinator to coordinate mercury monitoring efforts and ensure that adequate quantitation limits are met.

Revised RPA IMD, Appendix B Quantitative Limits Tables
WetChem

EPA No.	Compound	CAS Number	Preferred Method	Freshwater Criteria		Saltwater Criteria		Human Health: Consumption of		Drinking Water M.C.L.	Priority Pollutants	Quantitation Limit (ug/l)
				Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Water + Organism (ug/l)	Organism only (ug/l)			
1 N	Alkalinity		310.2 / SM 2320B		20,000							1000
16	Ammonia	7664417	350.1 / SM 4500NH3 G	pH and Temp. dependant	pH and Temp. dependant	pH and Temp. dependant	pH and Temp. dependant	pH and Temp. dependant	pH and Temp. dependant			1000
8 N	Chloride	16887006	300	860000	230000							1000
9 N	Chlorine	7782505	330.4 / SM 4500 CL-F	19	11	13	7.5					100
14	Cyanide	57125	335.4	22	5.2	1	1	140	140		y	5
25 N	Nitrates+Nitrite	14797558	300 / 353.4					10000		10mg		100
32 N	Oxygen, Dissolved	7782447										1000
36 N	Phosphorus Elemental	7723140	365.3				0.1					10
40 N	Sulfide-Hydrogen Sulfide	7783064			2		2					200

* See Document USEPA January 1985 (Freshwater), April 1989 (Marine Water)

Values shaded in blue are criteria below quantitation limit

Revised RPA IMD, Appendix B Quantitative Limits Tables
Other

EPA No.	Compound	CAS Number	Preferred Method	Freshwater Criteria		Saltwater Criteria		Human Health: Consumption of		Priority Pollutants	Quantitation Limit (ug/l)
				Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Acute (CMC) (ug/l)	Chronic (CCC) (ug/l)	Water + Organism (ug/l)	Organism only (ug/l)		
15	Asbestos	1332214	100.1 or 100.2								
16	Dioxin (2,3,7,8-TCDD)	1746016	1613						5.00E-09		0.000005
21 N	Malathion	121755	8141		0.1		0.1				0.2
24 N	Mirex	2385855	8081 / 608		0.001		0.001				0.01
28 N	Nitrosodibutylamine,N	924163	8270 / 521					0.0063	0.22		10
29 N	Nitrosodiethylamine,N	55185	8270 / 521					0.0008	1.24		10
30 N	Nitrosopyrrolidine,N	930552	8270 / 521					0.016	34		10
33 N	Parathion	56382	8141 / 8270	0.065	0.013						10

Values shaded in blue are criteria below quantitation limit