Biochemical Oxygen Demand Audit Checklist * (BOD and CBOD)

Based on NR 219 (2004), NR 149 (2008) and Standard Methods 5210 B (18th, 19th and 20th Editions)

*This checklist is for the aid of the Department and the laboratory. It is only an audit guideline, it is not meant to establish regulatory standards or to dictate audit format. Laboratories must comply with all applicable rule and method requirements whether listed on this checklist or not. The general quality control and record requirements are covered on a separate QC and Records Checklist.

	Sample Storage and Pretreatment	Y	N	Notes	Citation
1	Are BOD samples set up within 2 hours or stored at ≤ 6 ºC prior to analysis?				NR 219; Table F
2	Are samples set up within hold time (≤48 hours)?				NR 219; Table F; 5210 B
3	Are samples checked for residual chlorine if applicable?				5210 B; 4.e.(2)
4	If residual chlorine is found is the sample neutralized?				5210 B; 4.e.(2)
5	Is the pH of samples checked prior to set up?				20th 5210B; 4.e.
6	Are samples pH adjusted to pH 6.5 - 7.5 (if not in pH 6.0 - 8.5 initially)?				20th 5210B; 4.e.
7	If pH adjustment is done is the amount of acid or base used limited to ≤ 0.5% of sample volume?				5210B; 4.e.(1)
8	Are samples warmed to 20 +/-3 ºC before analysis?				20th 5210B; 1.b.
9	Are samples over the 100% DO saturation value identified and treated for super saturation?				5210B; 4.e.(4)

	Equipment	Y	N	Notes	Citation
10	Are all necessary reagents and glassware available? Reagents purchased_____or prepared_____?				5210 B; 2.& 3.
11	Is the DO meter properly calibrated on each analysis day? Water sat.air_____ Air sat. water____ or Winkler_____				NR149.44(6)(d)(1); NR149.44(6)(n)
12	Are thermometers used in the lab for incubators, refrigerators, samplers, sample measurement etc. calibrated annually with a NIST traceable thermometer?				NR149.44(3)(d)
13	Does the incubator maintain samples at 20 +/- 1 ºC during the 5 day test period?				5210B; 2.b.
14	Is the room temperature sufficiently controlled to meet the test requirements of 20+/- 3 ºC?				20th 5210B; 4.

	Sample Seeding	Y	N	Notes	Citation
15	What is the seed source and which samples are seeded?				5210B; 4.d.
16	Is the lot of seed recorded and linked to analysis.				149.45(1)
17	Is the seed properly prepared and measured?				5210B; 4.d.(1)
18	Are industrial, disinfected (UV or chlorine), or pH-adjusted samples seeded?				5210B; 4.e.(1&2)
19	Are at least two seed controls run that regularly meet depletion criteria?				5210B; 4.d.(2)
20	Are seed correction factors properly calculated and used to adjust results of seeded samples?				5210B; 4.d.(2)

	General Procedural Requirements	Y	N	Notes	Citation
21	Are the proper reagents prepared_____ or purchased_____ for dilution water preparation?				5210B; 3.
22	Are reagents properly labeled, recorded & good condition?				5210B; 3.
23	Is the dilution water properly made and stored?				5210B; 4.a.& b.
24	For sample dilutions of greater than 1:100 is a preliminary dilution done and recorded?				5210 B; 4.f.(2)
25	Are sample volumes adjusted so that depletion criteria are met as often as possible?(d*epletion of > 2 mg/L DO & remainder of > 1 mg/L DO)*				5210B; 4.f.
26	Are only samples and seed controls that meet criteria *(depletion of > 2 mg/L DO & remainder of > 1 mg/L DO)* used on the results?				5210B; 5.
27	Do at least two sample volumes meet the depletion criteria?				20th 5210 B; 4.f.
28	Are at least two sample dilutions run for each sample?				5210B; 4.f.
29	For samples over 201 mL are additional nutrients added? Nutrients:powder____ or liquid____(0.33 mL per 300 mL)?				20th 5210B; 4.f.
30	Are sample bottles water sealed prior to incubation?				20th 5210B; 4.f. 18th/19th 5210B; 2.a.
31	If nitrification inhibitor is used, does the lab have certification or registration for CBOD?				NR149.13 Table 2
32	Are CBOD samples properly labeled and the results reported as CBOD?				NR 149.39(3)C(7)
33	Have sliding BODs been observed?				5210B; 4.e.(3)
34	If sliding BODs have been observed have steps been taken to identify the source of the toxicity?				5210B; 4.e.(3)
35	Are BOD values properly calculated for all samples?				5210B; 5.

	LCS - Glucose-Glutamic Acid (GGA) Standard	Y	N	Notes	Citation
36	Is GGA standard properly prepared or commercially purchased?				5210B; 3.h.
37	Is the lot of GGA standard recorded and linked to analysis.				149.45(1)(a)
38	Is GGA standard analyzed at a 2% dilution (6 mL to 300 mL) using a concentration that yields 3 mg/L glucose and 3 mg/L glutamic acid in the GGA test bottle?				5210B; 4.c.
39	Are GGA standards one per batch or weekly at a minimum (if < 20 samples are run in a week)?				NR149.48(4)(b)
40	Are seed controls run and correctly applied to GGA data?				5210B; 4.d.(2)
41	Do GGA results meet the 198 +/- 30.5 mg/L BOD standard? *(167.5 - 228.5)* Multiple GGA standards cannot be averaged.				5210B; 6.

	BOD-Specific Quality Control (refer to the QC and Records checklist for other QC/records requirements)	Y	N	Notes	Citation
42	Do all samples, standards and seed controls used to calculate results meet the depletion criteria?				5210B; 5.
43	If criteria are not met are data excluded from calculations or qualified if there are no acceptable dilutions to use?				5210B; 5.
44	Is a dilution water blank run with each batch of samples and/or batch of dilution water?				5210B; 4.h.
45	Do dilution water blanks meet the depletion limit of < 0.2 mg/L DO?				5210B; 4.h.

Other Observations