

APPENDIX J

TOXICITY DATA

2023 RHMP Toxicity Summary Tables

Table J-1.
2023 RHMP Toxicity Results – 10-Day Amphipod Survival Test (*Eohaustorius estuarius*)

Harbor	Strata	Station ID	Control Replicates (% Survival)					Sample Replicates (% Survival)					Mean Control (% Survival)	Mean Sample (% Survival)	% of Control	t-test (unequal variance)	Significant?
Dana Point Harbor	Marina	B23-12063	100	95	100	100	100	100	95	95	90	95	99	95	96	0.0356	Yes
Dana Point Harbor	Deep	B23-12064	100	95	100	100	100	100	100	90	90	100	99	96	97	0.1528	No
Dana Point Harbor	Marina	B23-12065	100	95	100	100	100	95	90	95	100	95	99	95	96	0.0356	Yes
Dana Point Harbor	Marina	B23-12066	100	95	100	100	100	85	100	100	100	95	99	96	97	0.1879	No
Oceanside Harbor	Marina	B23-12059	100	95	100	100	100	100	95	100	95	95	99	97	98	0.1214	No
Oceanside Harbor	Deep	B23-12060	100	95	100	100	100	80	90	85	90	85	99	86	87	0.0004	Yes
Oceanside Harbor	FW-Influenced	B23-12061	100	95	100	100	100	85	75	95	95	100	99	90	91	0.0573	No
Oceanside Harbor	Marina	B23-12062	100	95	100	100	100	80	95	95	85	100	99	91	92	0.0473	Yes
Mission Bay	Deep	B23-12022	90	100	100	100	95	85	95	90	95	100	97	93	96	0.1270	No
Mission Bay	Shallow	B23-12023	90	100	100	100	95	90	95	75	95	90	97	89	92	0.0515	No
Mission Bay	Shallow	B23-12024	90	100	100	100	95	80	85	90	80	90	97	85	88	0.0020	Yes
Mission Bay	FW-Influenced	B23-12025	90	100	100	100	95	90	90	90	95	75	97	88	91	0.0295	Yes
Mission Bay	FW-Influenced	B23-12026	90	100	100	100	95	80	85	90	85	70	97	82	85	0.0038	Yes
Mission Bay	Deep	B23-12055	90	100	100	100	95	80	75	100	100	95	97	90	93	0.1331	No
Mission Bay	Marina	B23-12056	90	100	100	100	95	95	95	80	95	90	97	91	94	0.0665	No
Mission Bay	Marina	B23-12057	90	100	100	100	95	95	90	95	85	85	97	90	93	0.0241	Yes
Mission Bay	Shallow	B23-12058	90	100	100	100	95	100	85	85	95	95	97	92	95	0.1041	No
North San Diego Bay	Deep	B23-12014	95	100	100	100	95	100	100	100	95	100	98	99	101	0.2727	No
North San Diego Bay	Deep	B23-12019	95	100	100	100	95	100	85	85	100	95	98	93	95	0.1119	No
North San Diego Bay	Deep	B23-12020	95	100	100	100	95	95	95	100	90	95	98	95	97	0.0872	No
North San Diego Bay	Deep	B23-12021	95	100	100	100	95	95	100	90	95	90	98	94	96	0.0587	No
North San Diego Bay	Marina	B23-12047	95	100	100	100	95	60	85	70	80	80	98	75	77	0.0027	Yes
North San Diego Bay	Marina	B23-12048	95	100	100	100	95	95	95	90	70	95	98	89	91	0.0691	No
North San Diego Bay	Marina	B23-12049	95	100	100	100	95	90	100	90	85	95	98	92	94	0.0401	Yes
North San Diego Bay	Marina	B23-12050	95	100	100	100	95	85	90	90	90	85	98	88	90	0.0002	Yes
North San Diego Bay	Marina	B23-12051	95	100	100	100	95	90	85	85	85	95	98	88	90	0.0021	Yes
North San Diego Bay	Shallow	B23-12052	95	100	100	100	95	85	100	100	100	85	98	94	96	0.1751	No
North San Diego Bay	Marina	B23-12053	95	100	100	100	95	95	90	95	80	85	98	89	91	0.0166	Yes
North San Diego Bay	Shallow	B23-12054	95	100	100	100	95	95	95	90	95	95	98	94	96	0.0182	Yes
North San Diego Bay	Deep	B23-12116	95	100	100	100	95	100	100	90	95	85	98	94	96	0.1290	No
North San Diego Bay	Deep	B23-12117	100	95	95	95	100	90	100	80	100	95	97	93	96	0.1788	No
North San Diego Bay	Industrial/Port	B23-12118	100	95	95	95	100	95	90	85	95	70	97	87	90	0.0485	Yes
North San Diego Bay	Industrial/Port	B23-12119	100	95	95	95	100	95	75	90	95	90	97	89	92	0.0476	Yes
North San Diego Bay	Industrial/Port	B23-12120	100	95	95	95	100	90	75	90	75	80	97	82	85	0.0044	Yes
North San Diego Bay	Shallow	B23-12121	95	100	100	100	95	100	95	100	100	90	98	97	99	0.3417	No
North San Diego Bay	Deep	B23-12122	95	100	100	100	95	95	100	95	95	95	98	96	98	0.1214	No
North San Diego Bay	Deep	B23-12123	95	100	100	100	95	85	95	90	90	90	98	90	92	0.0022	Yes
North San Diego Bay	Deep	B23-12124	95	100	100	100	95	90	95	85	90	85	98	89	91	0.0026	Yes
North San Diego Bay	Marina	B23-12841	95	100	100	100	95	95	85	100	90	95	98	93	95	0.0648	No
Central San Diego Bay	Shallow	B23-12009	100	95	95	95	100	85	95	95	90	90	97	91	94	0.0159	Yes
Central San Diego Bay	Shallow	B23-12010	100	95	95	95	100	90	80	80	90	90	97	86	89	0.0036	Yes
Central San Diego Bay	Shallow	B23-12011	100	95	95	95	100	95	85	80	90	95	97	89	92	0.0246	Yes
Central San Diego Bay	Deep	B23-12012	100	95	95	95	100	95	100	100	100	100	97	99	102	0.1214	No
Central San Diego Bay	Deep	B23-12089	95	95	95	100	95	90	95	95	95	90	96	93	97	0.0479	Yes

Table J-1.
2023 RHMP Toxicity Results – 10-Day Amphipod Survival Test (*Eohaustorius estuarius*)

Harbor	Strata	Station ID	Control Replicates (% Survival)					Sample Replicates (% Survival)					Mean Control (% Survival)	Mean Sample (% Survival)	% of Control	t-test (unequal variance)	Significant?
Central San Diego Bay	Industrial/Port	B23-12090	95	95	95	100	95	95	100	85	90	100	96	94	98	0.2727	No
Central San Diego Bay	Industrial/Port	B23-12091	100	95	95	100	100	75	85	80	80	70	98	78	80	0.0002	Yes
Central San Diego Bay	Industrial/Port	B23-12093	100	95	95	100	100	70	85	60	85	85	98	77	79	0.0067	Yes
Central San Diego Bay	Industrial/Port	B23-12095	100	95	95	100	100	80	65	80	60	85	98	74	76	0.0032	Yes
Central San Diego Bay	Industrial/Port	B23-12096	100	95	95	100	100	55	60	70	60	60	98	61	62	0.0000	Yes
Central San Diego Bay	Industrial/Port	B23-12097	100	95	95	100	100	80	95	95	90	80	98	88	90	0.0195	Yes
Central San Diego Bay	Industrial/Port	B23-12098	100	95	95	100	100	85	85	65	55	65	98	71	72	0.0048	Yes
Central San Diego Bay	Industrial/Port	B23-12099	100	95	95	100	100	75	60	75	95	75	98	76	78	0.0076	Yes
Central San Diego Bay	FW-Influenced	B23-12102	100	95	95	100	100	75	70	50	65	65	98	65	66	0.0004	Yes
Central San Diego Bay	Industrial/Port	B23-12103	100	95	95	100	100	70	90	55	85	55	98	71	72	0.0100	Yes
Central San Diego Bay	Industrial/Port	B23-12107	100	95	95	100	100	65	65	70	60	90	98	70	71	0.0024	Yes
Central San Diego Bay	FW-Influenced	B23-12109	100	95	95	100	100	95	75	90	90	75	98	85	87	0.0167	Yes
Central San Diego Bay	FW-Influenced	B23-12110	100	95	95	100	100	85	70	55	60	85	98	71	72	0.0055	Yes
Central San Diego Bay	Industrial/Port	B23-12114	100	95	95	95	100	85	80	80	80	80	97	81	84	0.0000	Yes
Central San Diego Bay	Industrial/Port	B23-12115	100	95	95	95	100	60	85	60	70	60	97	67	69	0.0014	Yes
Central San Diego Bay	FW-Influenced	B23-12155	100	95	95	100	100	5	10	5	5	0	98	5	5	0.0000	Yes
South San Diego Bay	Shallow	B23-12000	100	95	100	100	100	95	95	100	100	90	99	96	97	0.1031	No
South San Diego Bay	Shallow	B23-12001	100	95	100	100	100	90	95	100	95	100	99	96	97	0.1031	No
South San Diego Bay	Shallow	B23-12002	100	95	100	100	100	75	90	85	100	95	99	89	90	0.0399	Yes
South San Diego Bay	Shallow	B23-12003	100	95	95	100	100	90	70	70	70	95	98	79	81	0.0126	Yes
South San Diego Bay	Shallow	B23-12004	95	95	95	100	95	80	80	85	80	75	96	80	83	0.0000	Yes
South San Diego Bay	FW-Influenced	B23-12005	100	95	100	100	100	100	85	95	95	90	99	93	94	0.0389	Yes
South San Diego Bay	FW-Influenced	B23-12006	95	95	95	100	95	95	90	95	75	70	96	85	89	0.0518	No
South San Diego Bay	FW-Influenced	B23-12007	95	95	95	100	95	95	100	100	100	85	96	96	100	0.5000	No
South San Diego Bay	FW-Influenced	B23-12008	95	95	95	100	95	95	85	90	95	95	96	92	96	0.0624	No
South San Diego Bay	Shallow	B23-12045	95	95	95	100	95	90	85	85	90	75	96	85	89	0.0064	Yes
South San Diego Bay	Marina	B23-12046	95	95	95	100	95	90	85	85	70	85	96	83	86	0.0080	Yes
South San Diego Bay	FW-Influenced	B23-12148	100	95	100	100	100	90	80	85	75	75	99	81	82	0.0011	Yes
South San Diego Bay	FW-Influenced	B23-12150	100	95	100	100	100	100	95	100	95	95	99	97	98	0.1214	No
South San Diego Bay	FW-Influenced	B23-12151	95	95	95	100	95	85	90	80	85	100	96	88	92	0.0383	Yes
South San Diego Bay	FW-Influenced	B23-12152	95	95	95	100	95	100	95	90	100	100	96	97	101	0.3354	No

Table J-2.
2023 RHMP Toxicity Results – 48-hour Bivalve Embryo Development Test (*Mytilus galloprovincialis*)

Harbor	Stratum	Station ID	Control Replicates (Combined % Normal and Alive)					Sample Replicates (Combined % Normal and Alive)					Mean Control (Combined % Normal and Alive)	Mean Sample (Combined % Normal and Alive)	% of Control	t-test (unequal variance)	Significant?
Dana Point Harbor	Marina	B23-12063	88.2	90.2	93.1	95.8	95.8	85.0	78.0	92.9	84.6	86.2	92.6	85.4	92.2	0.0190	Yes
Dana Point Harbor	Deep	B23-12064	88.2	90.2	93.1	95.8	95.8	89.8	84.3	84.3	87.8	83.1	92.6	85.8	92.7	0.0047	Yes
Dana Point Harbor	Marina	B23-12065	88.2	90.2	93.1	95.8	95.8	86.6	78.3	81.9	89.8	78.7	92.6	83.1	89.7	0.0048	Yes
Dana Point Harbor	Marina	B23-12066	88.2	90.2	93.1	95.8	95.8	79.9	89.8	87.8	90.2	78.0	92.6	85.1	91.9	0.0216	Yes
Oceanside Harbor	Marina	B23-12059	88.2	90.2	93.1	95.8	95.8	88.2	94.9	87.8	93.3	89.4	92.6	90.7	98.0	0.1956	No
Oceanside Harbor	Deep	B23-12060	88.2	90.2	93.1	95.8	95.8	85.8	90.6	84.3	87.4	79.9	92.6	85.6	92.4	0.0085	Yes
Oceanside Harbor	FW-Influenced	B23-12061	88.2	90.2	93.1	95.8	95.8	81.5	90.9	82.7	89.4	83.1	92.6	85.5	92.3	0.0107	Yes
Oceanside Harbor	Marina	B23-12062	88.2	90.2	93.1	95.8	95.8	91.3	90.2	78.7	93.3	87.0	92.6	88.1	95.1	0.0887	No
Mission Bay	Deep	B23-12022	88.2	90.2	93.1	95.8	95.8	87.8	78.0	81.1	86.2	86.2	92.6	83.9	90.6	0.0035	Yes
Mission Bay	Shallow	B23-12023	88.2	90.2	93.1	95.8	95.8	76.0	78.3	83.1	90.9	73.2	92.6	80.3	86.7	0.0064	Yes
Mission Bay	Shallow	B23-12024	88.2	90.2	93.1	95.8	95.8	80.7	88.6	77.6	82.7	81.5	92.6	82.2	88.8	0.0012	Yes
Mission Bay	FW-Influenced	B23-12025	88.2	90.2	93.1	95.8	95.8	83.1	92.1	77.2	90.9	77.2	92.6	84.1	90.8	0.0283	Yes
Mission Bay	FW-Influenced	B23-12026	88.2	90.2	93.1	95.8	95.8	83.1	82.3	81.1	0.0	77.6	92.6	81.0	87.5	0.0003	Yes
Mission Bay	Deep	B23-12055	88.2	90.2	93.1	95.8	95.8	87.0	81.1	54.7	76.8	75.6	92.6	75.0	81.0	0.0149	Yes
Mission Bay	Marina	B23-12056	88.2	90.2	93.1	95.8	95.8	79.1	95.4	29.5	86.2	87.8	92.6	87.1	94.1	0.1035	No
Mission Bay	Marina	B23-12057	88.2	90.2	93.1	95.8	95.8	84.3	85.4	79.1	94.9	73.2	92.6	83.4	90.0	0.0304	Yes
Mission Bay	Shallow	B23-12058	88.2	90.2	93.1	95.8	95.8	90.9	74.8	87.0	22.0	83.9	92.6	84.2	90.9	0.0425	Yes
North San Diego Bay	Deep	B23-12014	94.0	86.1	83.5	83.8	94.7	65.0	74.1	90.6	78.9	92.5	88.4	80.2	90.7	0.1015	No
North San Diego Bay	Deep	B23-12019	94.0	86.1	83.5	83.8	94.7	88.7	65.8	68.4	83.1	90.2	88.4	79.2	89.6	0.0798	No
North San Diego Bay	Deep	B23-12020	94.0	86.1	83.5	83.8	94.7	74.8	91.4	70.3	64.3	63.2	88.4	72.8	82.3	0.0171	Yes
North San Diego Bay	Deep	B23-12021	94.0	86.1	83.5	83.8	94.7	71.8	78.9	83.8	88.3	74.4	88.4	79.5	89.9	0.0261	Yes
North San Diego Bay	Marina	B23-12047	94.0	86.1	83.5	83.8	94.7	93.4	74.8	69.5	83.5	82.7	88.4	80.8	91.4	0.0775	No
North San Diego Bay	Marina	B23-12048	94.0	86.1	83.5	83.8	94.7	82.7	86.5	91.6	83.1	81.2	88.4	85.0	96.1	0.1520	No
North San Diego Bay	Marina	B23-12049	94.0	86.1	83.5	83.8	94.7	69.2	72.6	62.4	81.2	74.8	88.4	72.0	81.5	0.0018	Yes
North San Diego Bay	Marina	B23-12050	94.0	86.1	83.5	83.8	94.7	79.7	84.2	75.9	80.5	85.7	88.4	81.2	91.8	0.0235	Yes
North San Diego Bay	Marina	B23-12051	94.0	86.1	83.5	83.8	94.7	70.7	85.3	78.6	74.4	88.7	88.4	79.5	90.0	0.0342	Yes
North San Diego Bay	Shallow	B23-12052	94.0	86.1	83.5	83.8	94.7	78.9	71.4	89.5	91.4	0.0	88.4	82.8	93.7	0.1700	No
North San Diego Bay	Marina	B23-12053	94.0	86.1	83.5	83.8	94.7	59.8	75.2	53.8	72.6	55.6	88.4	63.4	71.7	0.0011	Yes
North San Diego Bay	Shallow	B23-12054	94.0	86.1	83.5	83.8	94.7	79.7	83.1	75.2	68.4	75.9	88.4	76.5	86.5	0.0045	Yes
North San Diego Bay	Deep	B23-12116	94.0	86.1	83.5	83.8	94.7	82.0	92.9	93.2	76.7	83.5	88.4	85.6	96.8	0.2563	No
North San Diego Bay	Deep	B23-12117	90.5	93.9	93.6	89.2	80.3	76.9	80.7	80.7	86.8	80	89.5	81.0	90.5	0.0121	Yes
North San Diego Bay	Industrial/Port	B23-12118	90.5	93.9	93.6	89.2	80.3	80.7	87.1	65.4	75.6	69.5	89.5	75.7	84.5	0.0101	Yes
North San Diego Bay	Industrial/Port	B23-12119	90.5	93.9	93.6	89.2	80.3	80	86.8	64.4	81	82.4	89.5	78.9	88.2	0.0267	Yes
North San Diego Bay	Industrial/Port	B23-12120	90.5	93.9	93.6	89.2	80.3	84.7	83.1	75.9	87.8	84.1	89.5	83.1	92.9	0.0399	Yes
North San Diego Bay	Shallow	B23-12121	94.0	86.1	83.5	83.8	94.7	66.9	75.2	66.2	72.2	85.0	88.4	73.1	82.7	0.0039	Yes
North San Diego Bay	Deep	B23-12122	94.0	86.1	83.5	83.8	94.7	65.4	59.0	82.3	68.0	80.1	88.4	71.0	80.3	0.0065	Yes
North San Diego Bay	Deep	B23-12123	94.0	86.1	83.5	83.8	94.7	83.5	76.7	74.4	81.6	89.5	88.4	81.1	91.8	0.0394	Yes
North San Diego Bay	Deep	B23-12124	94.0	86.1	83.5	83.8	94.7	86.5	73.3	96.6	74.4	68.8	88.4	79.9	90.4	0.0931	No

Notes:
Red indicates replicate considered an outlier using Grubbs outlier test (poor recovery during termination and heavy debris observed). Outliers were excluded from analysis.

Table J-2.
2023 RHMP Toxicity Results – 48-hour Bivalve Embryo Development Test (*Mytilus galloprovincialis*)

Harbor	Stratum	Station ID	Control Replicates (Combined % Normal and Alive)					Sample Replicates (Combined % Normal and Alive)					Mean Control (Combined % Normal and Alive)	Mean Sample (Combined % Normal and Alive)	% of Control	t-test (unequal variance)	Significant?
North San Diego Bay	Marina	B23-12841	94.0	86.1	83.5	83.8	94.7	85.7	77.8	74.8	82.7	69.2	88.4	78.0	88.3	0.0135	Yes
Central San Diego Bay	Shallow	B23-12009	90.5	93.9	93.6	89.2	80.3	81.4	73.9	81.0	74.6	81.0	89.5	78.4	87.6	0.0037	Yes
Central San Diego Bay	Shallow	B23-12010	90.5	93.9	93.6	89.2	80.3	69.8	80.3	90.2	77.3	87.8	89.5	81.1	90.6	0.0495	Yes
Central San Diego Bay	Shallow	B23-12011	90.5	93.9	93.6	89.2	80.3	87.8	80.3	86.4	92.5	89.5	89.5	87.3	97.5	0.2555	No
Central San Diego Bay	Deep	B23-12012	90.5	93.9	93.6	89.2	80.3	89.5	75.6	81.0	84.7	74.6	89.5	81.1	90.6	0.0272	Yes
Central San Diego Bay	Deep	B23-12089	85.8	90.9	86.7	95.0	93.4	86.3	96.3	84.6	85.0	95.5	90.4	89.5	99.1	0.4018	No
Central San Diego Bay	Industrial/Port	B23-12090	85.8	90.9	86.7	95.0	93.4	92.7	94.2	96.3	82.9	93.8	90.4	92.0	102	0.3000	No
Central San Diego Bay	Industrial/Port	B23-12091	85.8	90.9	86.7	95.0	93.4	75.8	85.0	82.5	81.3	70.8	90.4	79.1	87.5	0.0042	Yes
Central San Diego Bay	Industrial/Port	B23-12093	85.8	90.9	86.7	95.0	93.4	92.1	81.3	98.0	59.6	79.6	90.4	82.1	90.9	0.1428	No
Central San Diego Bay	Industrial/Port	B23-12095	85.8	90.9	86.7	95.0	93.4	90.0	80.8	85.4	95.0	80.8	90.4	86.4	95.6	0.1338	No
Central San Diego Bay	Industrial/Port	B23-12096	85.8	90.9	86.7	95.0	93.4	96.3	76.3	97.9	84.6	86.3	90.4	88.3	97.7	0.3263	No
Central San Diego Bay	Industrial/Port	B23-12097	85.8	90.9	86.7	95.0	93.4	92.4	83.8	78.8	90.0	82.5	90.4	85.5	94.6	0.0785	No
Central San Diego Bay	Industrial/Port	B23-12098	90.5	93.9	93.6	89.2	80.3	93.2	93.9	87.1	90.8	84.7	89.5	89.9	100	0.4444	No
Central San Diego Bay	Industrial/Port	B23-12099	90.5	93.9	93.6	89.2	80.3	90.5	88.1	88.5	76.3	82.7	89.5	85.2	95.2	0.1324	No
Central San Diego Bay	FW-Influenced	B23-12102	85.8	90.9	86.7	95.0	93.4	86.3	91.7	89.2	90.4	84.2	90.4	88.4	97.8	0.2026	No
Central San Diego Bay	Industrial/Port	B23-12103	90.5	93.9	93.6	89.2	80.3	84.4	85.4	69.2	72.9	75.9	89.5	77.6	86.7	0.0097	Yes
Central San Diego Bay	Industrial/Port	B23-12107	90.5	93.9	93.6	89.2	80.3	87.8	84.4	97.4	86.8	85.1	89.5	88.3	98.7	0.3670	No
Central San Diego Bay	FW-Influenced	B23-12109	90.5	93.9	93.6	89.2	80.3	95.7	81.0	84.1	87.8	82.0	89.5	86.1	96.2	0.1897	No
Central San Diego Bay	FW-Influenced	B23-12110	90.5	93.9	93.6	89.2	80.3	94.2	86.4	92.5	86.1	83.1	89.5	88.5	98.8	0.3783	No
Central San Diego Bay	Industrial/Port	B23-12114	90.5	93.9	93.6	89.2	80.3	65.4	80.0	66.1	74.6	88.1	89.5	74.8	83.6	0.0117	Yes
Central San Diego Bay	Industrial/Port	B23-12115	90.5	93.9	93.6	89.2	80.3	87.5	83.4	78.0	79.0	84.7	89.5	82.5	92.2	0.0270	Yes
Central San Diego Bay	FW-Influenced	B23-12155	90.5	93.9	93.6	89.2	80.3	72.5	69.2	72.5	68.8	86.1	89.5	73.8	82.5	0.0025	Yes
South San Diego Bay	Shallow	B23-12000	88.9	91.1	87.0	91.1	88.5	90.0	85.6	88.9	88.1	82.6	89.3	87.0	97.4	0.0922	No
South San Diego Bay	Shallow	B23-12001	88.9	91.1	87.0	91.1	88.5	88.5	80.7	83.7	89.6	90.0	89.3	86.5	96.8	0.1064	No
South San Diego Bay	Shallow	B23-12002	88.9	91.1	87.0	91.1	88.5	94.1	84.1	84.8	86.3	88.5	89.3	87.6	98.0	0.2028	No
South San Diego Bay	Shallow	B23-12003	85.8	90.9	86.7	95.0	93.4	85.4	80.0	96.0	95.9	97.2	90.4	90.9	101	0.4473	No
South San Diego Bay	Shallow	B23-12004	85.8	90.9	86.7	95.0	93.4	79.2	79.6	78.3	91.3	86.3	90.4	82.9	91.8	0.0236	Yes
South San Diego Bay	FW-Influenced	B23-12005	88.9	91.1	87.0	91.1	88.5	86.3	82.6	86.3	93.5	83.0	89.3	86.3	96.6	0.1057	No
South San Diego Bay	FW-Influenced	B23-12006	85.8	90.9	86.7	95.0	93.4	90.8	85.8	82.1	80.4	86.3	90.4	85.1	94.2	0.0364	Yes
South San Diego Bay	FW-Influenced	B23-12007	85.8	90.9	86.7	95.0	93.4	81.3	93.8	68.8	87.1	94.2	90.4	85.0	94.1	0.1690	No
South San Diego Bay	FW-Influenced	B23-12008	85.8	90.9	86.7	95.0	93.4	80.0	93.3	76.3	87.5	83.8	90.4	84.2	93.2	0.0597	No
South San Diego Bay	Shallow	B23-12045	85.8	90.9	86.7	95.0	93.4	91.7	95.2	83.3	75.0	46.7	90.4	78.4	86.7	0.1209	No
South San Diego Bay	Marina	B23-12046	85.8	90.9	86.7	95.0	93.4	95.8	81.7	80.4	97.5	77.1	90.4	86.5	95.7	0.2179	No
South San Diego Bay	FW-Influenced	B23-12148	88.9	91.1	87.0	91.1	88.5	85.9	81.1	81.5	83.7	80.4	89.3	82.5	92.4	0.0004	Yes
South San Diego Bay	FW-Influenced	B23-12150	88.9	91.1	87.0	91.1	88.5	93.9	83.0	83.3	89.6	91.1	89.3	88.2	98.7	0.3199	No
South San Diego Bay	FW-Influenced	B23-12151	85.8	90.9	86.7	95.0	93.4	87.9	71.7	90.0	82.5	95.1	90.4	85.4	94.6	0.1534	No
South San Diego Bay	FW-Influenced	B23-12152	85.8	90.9	86.7	95.0	93.4	93.3	93.3	87.5	97.6	92.4	90.4	92.8	103	0.1697	No

2023 RHMP Toxicity SQO LOE Summary Table

Table J-3.

2023 RHMP Sediment Quality Objectives (SQO) Assessment

Toxicity SQO LOE

Harbor	Strata	Station ID	<i>E. estuarius</i> 10-Day Test: Toxicity Category	<i>M. galloprovincialis</i> SWI Test: Toxicity Category	Integrated Toxicity Indicator
Dana Point Harbor	Marina	B23-12063	Nontoxic	Nontoxic	Nontoxic
Dana Point Harbor	Deep	B23-12064	Nontoxic	Nontoxic	Nontoxic
Dana Point Harbor	Marina	B23-12065	Nontoxic	Nontoxic	Nontoxic
Dana Point Harbor	Marina	B23-12066	Nontoxic	Nontoxic	Nontoxic
Oceanside Harbor	Marina	B23-12059	Nontoxic	Nontoxic	Nontoxic
Oceanside Harbor	Deep	B23-12060	Low Toxicity	Nontoxic	Low Toxicity
Oceanside Harbor	FW-Influenced	B23-12061	Nontoxic	Nontoxic	Nontoxic
Oceanside Harbor	Marina	B23-12062	Nontoxic	Nontoxic	Nontoxic
Mission Bay	Deep	B23-12022	Nontoxic	Nontoxic	Nontoxic
Mission Bay	Shallow	B23-12023	Nontoxic	Nontoxic	Nontoxic
Mission Bay	Shallow	B23-12024	Low Toxicity	Nontoxic	Low Toxicity
Mission Bay	FW-Influenced	B23-12025	Low Toxicity	Nontoxic	Low Toxicity
Mission Bay	FW-Influenced	B23-12026	Low Toxicity	Nontoxic	Low Toxicity
Mission Bay	Deep	B23-12055	Nontoxic	Low Toxicity	Low Toxicity
Mission Bay	Marina	B23-12056	Nontoxic	Nontoxic	Nontoxic
Mission Bay	Marina	B23-12057	Nontoxic	Nontoxic	Nontoxic
Mission Bay	Shallow	B23-12058	Nontoxic	Nontoxic	Nontoxic
North San Diego Bay	Deep	B23-12014	Nontoxic	Nontoxic	Nontoxic
North San Diego Bay	Deep	B23-12019	Nontoxic	Nontoxic	Nontoxic
North San Diego Bay	Deep	B23-12020	Nontoxic	Low Toxicity	Low Toxicity
North San Diego Bay	Deep	B23-12021	Nontoxic	Nontoxic	Nontoxic
North San Diego Bay	Marina	B23-12047	Moderate Toxicity	Nontoxic	Low Toxicity
North San Diego Bay	Marina	B23-12048	Nontoxic	Nontoxic	Nontoxic
North San Diego Bay	Marina	B23-12049	Nontoxic	Low Toxicity	Low Toxicity
North San Diego Bay	Marina	B23-12050	Low Toxicity	Nontoxic	Low Toxicity
North San Diego Bay	Marina	B23-12051	Low Toxicity	Nontoxic	Low Toxicity
North San Diego Bay	Shallow	B23-12052	Nontoxic	Nontoxic	Nontoxic
North San Diego Bay	Marina	B23-12053	Low Toxicity	Moderate Toxicity	Moderate Toxicity
North San Diego Bay	Shallow	B23-12054	Nontoxic	Low Toxicity	Low Toxicity
North San Diego Bay	Deep	B23-12116	Nontoxic	Nontoxic	Nontoxic
North San Diego Bay	Deep	B23-12117	Nontoxic	Nontoxic	Nontoxic
North San Diego Bay	Industrial/Port	B23-12118	Low Toxicity	Low Toxicity	Low Toxicity
North San Diego Bay	Industrial/Port	B23-12119	Low Toxicity	Low Toxicity	Low Toxicity
North San Diego Bay	Industrial/Port	B23-12120	Low Toxicity	Nontoxic	Low Toxicity
North San Diego Bay	Shallow	B23-12121	Nontoxic	Low Toxicity	Low Toxicity
North San Diego Bay	Deep	B23-12122	Nontoxic	Low Toxicity	Low Toxicity
North San Diego Bay	Deep	B23-12123	Nontoxic	Nontoxic	Nontoxic
North San Diego Bay	Deep	B23-12124	Low Toxicity	Nontoxic	Low Toxicity
North San Diego Bay	Marina	B23-12841	Nontoxic	Low Toxicity	Low Toxicity
Central San Diego Bay	Shallow	B23-12009	Nontoxic	Low Toxicity	Low Toxicity
Central San Diego Bay	Shallow	B23-12010	Low Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	Shallow	B23-12011	Low Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	Deep	B23-12012	Nontoxic	Nontoxic	Nontoxic
Central San Diego Bay	Deep	B23-12089	Nontoxic	Nontoxic	Nontoxic
Central San Diego Bay	Industrial/Port	B23-12090	Nontoxic	Nontoxic	Nontoxic
Central San Diego Bay	Industrial/Port	B23-12091	Moderate Toxicity	Low Toxicity	Moderate Toxicity
Central San Diego Bay	Industrial/Port	B23-12093	Moderate Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	Industrial/Port	B23-12095	Moderate Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	Industrial/Port	B23-12096	Moderate Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	Industrial/Port	B23-12097	Low Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	Industrial/Port	B23-12098	Moderate Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	Industrial/Port	B23-12099	Moderate Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	FW-Influenced	B23-12102	Moderate Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	Industrial/Port	B23-12103	Moderate Toxicity	Low Toxicity	Moderate Toxicity
Central San Diego Bay	Industrial/Port	B23-12107	Moderate Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	FW-Influenced	B23-12109	Low Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	FW-Influenced	B23-12110	Moderate Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	Industrial/Port	B23-12114	Low Toxicity	Low Toxicity	Low Toxicity
Central San Diego Bay	Industrial/Port	B23-12115	Moderate Toxicity	Nontoxic	Low Toxicity
Central San Diego Bay	FW-Influenced	B23-12155	High Toxicity	Low Toxicity	Moderate Toxicity
South San Diego Bay	Shallow	B23-12000	Nontoxic	Nontoxic	Nontoxic
South San Diego Bay	Shallow	B23-12001	Nontoxic	Nontoxic	Nontoxic
South San Diego Bay	Shallow	B23-12002	Low Toxicity	Nontoxic	Low Toxicity
South San Diego Bay	Shallow	B23-12003	Moderate Toxicity	Nontoxic	Low Toxicity
South San Diego Bay	Shallow	B23-12004	Low Toxicity	Nontoxic	Low Toxicity
South San Diego Bay	FW-Influenced	B23-12005	Nontoxic	Nontoxic	Nontoxic
South San Diego Bay	FW-Influenced	B23-12006	Nontoxic	Nontoxic	Nontoxic
South San Diego Bay	FW-Influenced	B23-12007	Nontoxic	Nontoxic	Nontoxic
South San Diego Bay	FW-Influenced	B23-12008	Nontoxic	Nontoxic	Nontoxic
South San Diego Bay	Shallow	B23-12045	Low Toxicity	Nontoxic	Low Toxicity
South San Diego Bay	Marina	B23-12046	Low Toxicity	Nontoxic	Low Toxicity
South San Diego Bay	FW-Influenced	B23-12148	Low Toxicity	Nontoxic	Low Toxicity
South San Diego Bay	FW-Influenced	B23-12150	Nontoxic	Nontoxic	Nontoxic
South San Diego Bay	FW-Influenced	B23-12151	Low Toxicity	Nontoxic	Low Toxicity
South San Diego Bay	FW-Influenced	B23-12152	Nontoxic	Nontoxic	Nontoxic

Notes:

E. estuarius = *Eohaustorius estuarius* ; FW = freshwater; LOE = line of evidence; *M. galloprovincialis* = *Mytilus galloprovincialis* ; SWI = sediment-water interface

**2023 RHMP Toxicity Laboratory Report
(WSP Environmental Toxicology Laboratory)**

2023 REGIONAL HARBOR MONITORING PROGRAM Sediment Toxicity Testing Report

Submitted to:

**WSP USA,
9177 Sky Park Court
San Diego, CA 92123**

WSP Project Number: 2215100802.0003.

Submitted by:



**WSP USA
Aquatic Toxicology Laboratory
4905 Morena Blvd., Suite 1304
San Diego, California 92117**

Submitted: April 2025

The WSP aquatic toxicology laboratory is certified by the State of California Department of Health Services – Environmental Lab Accreditation Program (ELAP) under Certificate Number 3010. All test results were obtained following EPA Protocol guidelines and internal QA Program requirements. The data and test results have been reviewed and verified by the following laboratory representative:

Verified by: Alexander Gabriel Date: 4/21/2025.

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION.....	3
2.0 MATERIALS & METHODS.....	3
2.1 Sample Collection, Receipt, and Preparation	3
2.2 Toxicity Test Methodology	4
2.3 Statistical Analyses	8
2.4 Testing Schedule	8
3.0 RESULTS.....	9
3.1 Solid-Phase Tests.....	9
3.2 Sediment-Water Interface Tests	10
4.0 QUALITY ASSURANCE.....	10
4.1 Sample Receipt, Handling and Holding Time	10
4.2 Solid-Phase Toxicity Tests.....	11
4.3 Sediment-Water Interface Tests	11
4.4 Reference Toxicant Tests	11
5.0 REFERENCES.....	12

LIST OF TABLES

	Page
Table 1. Test Conditions for the 10-Day Sediment Test Using <i>Eohaustorius estuarius</i>	5
Table 2. Test Conditions for the 48-Hour Sediment-Water Interface Test Using <i>Mytilus galloprovincialis</i>	7
Table 3. Summary of Amphipod Survival Test Results.....	9
Table 4. Summary of Bivalve Sediment Water Interface Test Results.....	10

LIST OF APPENDICES

- APPENDIX A - Chain of Custody Forms and Sample Receipt Information
- APPENDIX B - Statistical Analyses and Raw Data Packages for *Eohaustorius*
- APPENDIX C - Statistical Analyses and Raw Data Packages for *Mytilus* Sediment-Water Interface
- APPENDIX D - List of Laboratory Qualifier Codes
- APPENDIX E - Reference Toxicant Test Control Charts

1.0 INTRODUCTION

The Regional Harbor Monitoring Program (RHMP) was developed by the Port of San Diego, City of San Diego, City of Oceanside, and County of Orange (RHMP Agencies) in response to a July 24, 2003, request by the San Diego Regional Water Quality Control Board (SDRWQCB) under §13225 of the California Water Code. The RHMP is a comprehensive effort to survey the general water quality, sediment quality, and condition of aquatic life in Dana Point Harbor, Oceanside Harbor, Mission Bay, and San Diego Bay and to determine whether beneficial uses are being protected and attained. Monitoring efforts in 2023 were fulfilled by the RHMP agencies through participation in the Southern California Bight 2023 Regional Marine Monitoring Survey (Bight '23) coordinated by the Southern California Coastal Water Research Project (SCCWRP). Program management and sample collection for the RHMP agencies was performed by WSP USA, Inc. Sediment toxicity testing was performed by WSP's in-house Aquatic Toxicology Laboratory (WSP Lab) in San Diego. Since the RHMP program coincided with the region-wide Bight '23 survey, in addition to standard USEPA testing protocols, specific testing guidelines provided by SCCWRP for Bight '23 were also followed for this monitoring event (SCCWRP 2023). Furthermore, toxicology and analytical laboratories were required to participate in a laboratory intercalibration exercise to ensure standard practices between labs and comparability of data generated throughout the region. The WSP Lab passed intercalibration testing for all toxicity test methods used during Bight '23. A total of 75 samples were collected throughout the RHMP area between August and September 2023. Sediments sampled for toxicity testing were collected in five batches to ensure that all samples were tested within the program specified two-week holding time. All sediment samples were evaluated using two test methods. These included:

- 10-Day amphipod *Eohaustorius estuarius* (*Eohaustorius*) survival solid-phase test (USEPA 1994; SCCWRP 2018)
- 48-hour mussel *Mytilus galloprovincialis* (*Mytilus*) larvae development sediment-water interface (SWI) test (Anderson et al., 1996; SCCWRP 2018)

2.0 MATERIALS & METHODS

The methods employed to evaluate sediment toxicity are described below.

2.1 Sample Collection, Receipt, and Preparation

Test site sediments for RHMP program samples were collected by WSP personnel. Approximately five liters of sediment were provided from each site in chemically inert PTFE (Teflon) containers. Samples were delivered in coolers with wet ice to the WSP Aquatic Toxicology Laboratory by WSP personnel following each collection event. Upon receipt, contents of coolers were verified against chain of custody forms. Temperatures were measured and recorded on a sample check-in form. All samples were stored at $4 \pm 2^{\circ}\text{C}$ in the dark until used for testing. Copies of chain of custody forms and sample check-in data sheets are provided in Appendix A. For the entire testing

program, each sample was sieved through a 1-mm Nitex® mesh screen to remove potential native organisms and ensure reliable test organism recovery. Interstitial porewater was collected for analysis of ammonia, salinity, and pH. Un-ionized ammonia was calculated based on salinity, pH, and the test temperature. Porewater was collected by siphoning water overlying sediments immediately after receipt by the laboratory when possible (sediments were packaged in the field after homogenizing with no overlying water present). If overlying water was not present upon arrival at the laboratory, sediments were centrifuged in order to extract porewater from the sediments. Prior to testing, each sample was again thoroughly homogenized by hand using a stainless steel spoon within the bag they were received in. Using this re-homogenized sediment, porewater surrogates were set up the day before each test and sediment within each was centrifuged on day 0 to accurately determine the ammonia levels that amphipods were exposed to at test initiation. These Day 0 results help to eliminate ammonia as a confounding factor and are provided in Appendix B.

2.2 Toxicity Test Methodology

Test methods and acceptability criteria for the 10-day amphipod and the mussel SWI are described in Tables 1 and 2, respectively. Additional guidance for the regional program was developed by SCCWRP in collaboration with participating laboratories and is outlined in the Bight '23 Toxicity Testing Manual (SCCWRP 2023). The solid-phase amphipod tests were conducted with two concurrent negative laboratory controls. The primary lab control sediment consisted of coarse sand collected at the same location as the amphipods. The lab control sand from the amphipod collection site is composed of nearly 100 percent sand and lacks silt and clay fractions. Therefore, an additional “fine grain size” control sediment was also tested to represent fine sediments commonly found within bays and harbors. The fine-grained sediment (approximately 40-50% silt and clay), was collected at a site in west Mission Bay with a prior history of having good sediment quality based on the Bight Program. This same site was revisited again in 2023; Site B23-12058.

The negative control for the bivalve embryo development test consisted of the same screen tubes used for the SWI test placed in 1L glass jars filled with natural seawater without sediment. Natural sand-filtered seawater was obtained from Scripps Institution of Oceanography in La Jolla, CA, further filtered to < 1-micron at the WSP toxicology laboratory prior to use. A second water-only control consisted of 20 mL glass scintillation vials with 10 mL laboratory seawater associated with the reference toxicant test which was performed using the same glass vial test chambers.

Table 1. Test Conditions for the 10-Day Sediment Test
Using the Marine Amphipod *Eohaustorius estuarius*

Sediment Sample Information	
Test sediment holding time requirements	2 weeks, maximum 4 weeks
Test sample storage conditions	4°C, dark, minimal head space
Lab control sediment source	From Northwestern Aquatic Sciences; Newport, Oregon
Lab control water source	Filtered natural seawater (20 µm) from Scripps Institution of Oceanography
Fine grain size control source	Locally collected by WSP personnel in Mission Bay, CA
Test Species	<i>E. estuarius</i>
Supplier	Northwestern Aquatic Sciences; Newport, Oregon
Test Procedures	USEPA 1994; SCCWRP 2018
Acclimation/holding time	2-10 days, including holding time required to adjust to test temperature and salinity (adjust by changing <3°C per day, and <5 ppt per day); measure water quality (DO, pH, salinity, and temperature) daily while holding
Age & Size class	Mature, 3–5 mm
Test type/duration	Acute solid phase (SP) / 10 days (sediment tests); 96-hr reference toxicant tests
Overlying water	Natural seawater collected off the SIO Pier in La Jolla, CA. 20-µm filtered and diluted to 32 ppt with deionized water prior to testing.
Test temperature	15 ± 2°C
Test dissolved oxygen (DO)	≥90% saturation (~8.0 mg/L)
Test pH	7.7-8.3 (pH not adjusted if outside the specified range)
Test interstitial total ammonia	<60 mg/L threshold
Test interstitial un-ionized ammonia	<0.8 mg/L threshold
Test photoperiod	Constant light to encourage amphipods to stay buried
Illuminance	500-1000 lux
Test chamber	1-L glass test chamber
Replicates/treatment	5
Organisms/replicate	20
Exposure volume	2 cm sediment; 800 mL water
Aeration	Whole Sediment Test: Continuous (1-2 bubbles/second using microtubing); Reference Toxicant Test: None
Feeding	No feeding during testing. Organisms in holding fed once, immediately upon receipt. 0.25g TetraMin® slurry in 100 mL seawater, for ~1000 animals.
Water renewal	None
Reference Toxicant Test	
Reference toxicant	Ammonia
Range of concentrations	Control, 15.6, 31.2, 62.5, 125, 250, and 500 mg total ammonia (NH ₃)/L, 4 replicates at 32 ± 2 ppt

Table 1. Test Conditions for the 10-Day Amphipod Survival Sediment Test
Using *Eohaustorius estuarius* (Cont.)

Water Quality Measurements	
Porewater: ammonia, pH, salinity	Upon sample receipt and on Day 0
Overlying water: ammonia	Start and end of test (Day 0 and Day 10)
Overlying water: pH, temperature, DO, salinity	Daily in 1 replicate or surrogate from each treatment
Test Acceptability Criteria	Control survival $\geq 90\%$; coefficient of variation (CV) ≤ 11.9 in the lab control

Notes:

°C - degrees Celsius
< - less than
≥ - greater than or equal to
≤ - less than or equal to
μm - micrometer(s)
DO - dissolved oxygen
g - gram(s)

L - liter(s)
mg/L - milligrams per liter
mL - milliliter(s)
mm - millimeter(s)
NH₃ - ammonia
ppt - parts per thousand

Table 2. Test Conditions for the 48-Hour Sediment-Water Interface Embryo Development Test
Using *Mytilus galloprovincialis*

Sediment Sample Information	
Test sediment holding time requirements	2 weeks, maximum 4 weeks
Test sample storage conditions	4°C, dark, minimal head space
Lab control water source	Filtered natural seawater (1.2 µm) from Scripps Institution of Oceanography
Test Species	Mediterranean Mussel <i>Mytilus galloprovincialis</i>
Source	Locally collected by WSP Lab personnel in San Diego, CA
Test procedures	Anderson, 1996 (modified); USEPA 1995; SCCWRP 2018
Test type:	Static non-renewal
Salinity:	32 ± 2 ppt
Temperature:	15 ± 2 °C
Test dissolved oxygen:	≥4.0 mg/L
Test pH:	pH 7.6-8.3 (pH not adjusted if outside the specified range)
Light quality:	Ambient laboratory light
Light intensity:	740 -1480 lux (ambient)
Photoperiod:	16h light 8h dark
Number of replicates:	5
Organisms/replicate	~250
Overlying water:	Natural seawater collected off the SIO Pier in La Jolla, CA. 1µm filtered and diluted to 32 ppt with deionized water prior to testing.
Test duration:	48-54 hours
Endpoint	Survival & normal shell development
Test chamber	SWI Test: 8-cm diameter x 17-cm-high glass mason jar (outer container); and 5-cm diameter, 14-cm high inner plastic container with a 20 micron screen suspended just above the sediment surface within which embryos are added and light aeration is provided. Reference Toxicant Test: 20-ml glass scintillation vials with 10-ml test solution.
Aeration	SWI Test: Continuous (1-2 bubbles/second using microtubing). Reference Toxicants Test: None
Sediment depth	4-5 cm
Water volume	SWI Test: 300 mL; Reference Toxicant Test: 10 mL
Reference Toxicant Test	
Reference toxicant	Ammonia
Range of concentrations	Control, 2, 4, 6, 8, 10, and 20 mg total NH ₃ /L, 5 replicates at 32 ±2 ppt
Water Quality Measurements	
Overlying water: ammonia	Start and end of test (Day 0 and Day 2)

Table 2. Test Conditions for the 48-Hour Sediment-Water Interface Embryo Development Test
Using *Mytilus galloprovincialis* (Cont.)

Overlying water: pH, temperature, DO, salinity	Daily, in 1 replicate or surrogate from each treatment
Test Acceptability Criteria	Control %normal-alive must be $\geq 80\%$

Notes:

°C - degrees Celsius
 $\geq$ - greater than or equal to
 μm - micrometer(s)
cm - centimeter
DO - dissolved oxygen
h - hour(s)

mg/L - milligrams per liter
mL - milliliter(s)
ppt - parts per thousand
USEPA - U.S. Environmental Protection Agency

2.3 Statistical Analyses

For the amphipod tests, survival in each sample was compared to survival in the lab control. Unpaired t-test comparisons assuming unequal variance were performed to identify significant differences between the amphipod survival in the laboratory control and individual samples. Comparisons between each site and the concurrent grain size control were also performed to evaluate the potential influence related to fine sediments alone.

For the mussel tests, percent normal-alive (# normal embryos/ # initial embryos) in each sample was compared to percent normal-alive in the water-only lab control. Unpaired t-test comparisons assuming unequal variance were performed to identify significant differences between mussel survival and development in the laboratory control and individual samples. Statistical analyses of test data for both species were performed using GraphPad Prism, Version 10.1.1 – 10.1.2. Statistical analyses for the reference toxicant data were performed using Comprehensive Environmental Toxicity Information System Software (CETIS™), version 2.1.3.5 – 2.1.5.5 (Tidepool Scientific Software 2009 - 20022).

2.4 Testing Schedule

Tests for all samples were initiated within two weeks of sample collection for both species. A summary of the sample identification numbers, sample collection and receipt dates, and chain of custody forms is provided in Appendix A.

3.0 RESULTS

Results for all test batches are summarized below. Each control group represents the group of samples randomized with that specific control on the same shelf within the environmental chamber. All lab controls for both species met test acceptability criteria as defined in the Bight '23 Toxicity Testing Manual. A summary of toxicity test results is discussed below and detailed summaries, statistical results, and raw data sheets are provided in Appendix B (amphipods) and Appendix C (mussels).

3.1 Solid-Phase Amphipod Survival Tests

Mean amphipod survival for each of the seven test batches is provided in Table 3, and detailed results are available in Appendix B. A total of forty-seven samples exhibited statistically significant effects to survival when compared to the lab control; four from Dana Point and Oceanside Harbor, four from Mission Bay, and thirty-eight from San Diego Bay. Mean survival in the Fine Grain Size Control across all test batches ranged from 93 to 99 percent, except for the last test batch, where mean survival was 87%. This indicated that the organisms were not particularly sensitive to fine grain size for the majority of the study, except for the last batch, where there was a 9% difference compared to associated lab control.

Table 3. Summary of Amphipod Survival Test Results

Test Batch #	Location	Test Date	Mean Percent Survival		# Samples Statistically Reduced from Control
			Lab Control Result	Samples (Range of Results)	
1	SD Bay (South-Shallow)	8/15/23	99	81-97	3
2	Dana Pt. & Oceanside	8/22/23	99	86-97	4
3	Mission Bay	8/29/23	97	82-93	4
4	SD Bay (North and Central)	9/5/23	98	75-99	8
5	SD Bay (North, Central and South)	9/12/23	97	67-99	8
6	SD Bay (Central and South)	9/15/23	98	5-88	14
7	SD Bay (South)	9/19/23	96	80-97	5

Notes: Statistically significant differences may not show in the Sediment Quality Objective Scores if mean percent survival is greater than Test Acceptability Criteria (TAC).

3.2 Sediment-Water Interface Bivalve Embryo Development Tests

A summary of mean percent normal-alive mussel embryos for each of the five test batches is provided in Table 4, and detailed results are available in Appendix C. A total of forty samples were found to be statistically reduced from the control; fourteen from Dana Point Harbor, Oceanside Harbor and Mission Bay, and twenty-six from San Diego Bay.

Table 4. Summary of Bivalve Sediment Water Interface Test Results

Test Batch #	Location	Test Date	Mean Percent Normal-Alive		# Samples Statistically Reduced from Control
			Lab Control Result	Samples (Range of Results)	
1	SD Bay (South-Shallow)	8/16/23	89	83-88	1
2	Dana Pt., Oceanside & Mission Bay	8/30/23	93	75-91	14
3	SD Bay (North and Central)	9/6/23	88	63-86	11
4	SD Bay (North, Central and South)	9/14/23	90	74-90	11
5	SD Bay (Central and South)	9/20/23	90	78-93	3

Notes: Statistically significant differences may not show in the Sediment Quality Objective Scores if mean percent survival is greater than Test Acceptability Criteria (TAC).

Following guidance from SCCWRP, unpaired t-test comparisons assuming unequal variances were performed for each sample using untransformed data for both amphipod survival and mussel survival and development (percent normal-alive). Tables summarizing statistical results for all samples, locations and strata are provided in Appendix B for the amphipod survival tests and Appendix C for the bivalve sediment-water interface tests.

4.0 QUALITY ASSURANCE

All data presented has been thoroughly reviewed and deemed acceptable for reporting in accordance with relevant protocols and WSP's internal QA/QC program. Any deviations with respect to test conditions and acceptability criteria are summarized below by test type. All were determined to be minor with no impact on the final data or its interpretation. A list of laboratory qualifier codes can be found in Appendix D.

4.1 Sample Receipt, Handling and Holding Time

Samples were received and processed according to protocol described in previous sections. All tests were initiated within the recommended holding time of two weeks as suggested in the SCCWRP Bight '23 Toxicology Laboratory Manual (SCCWRP 2023). All samples were received on ice and held at $4 \pm 2^{\circ}\text{C}$ in the dark until used for testing. All total and unionized ammonia values

were below reported thresholds for both test species (SCCWRP 2018; USEPA 1994). All ammonia calculations and raw ammonia data sheets are included with raw bench data sheets for each batch of amphipod and mussel tests.

4.2 Solid-Phase Amphipod Survival Toxicity Tests

All water quality parameters were within required ranges as defined by the test protocol for the entirety of the test.

4.3 Sediment-Water Interface Mussel Embryo Development Tests

All water quality parameters were within required ranges as defined by the test protocol for the entirety of the test. While testing batches 2 and 3 (Mission Bay and North San Diego Bay), there were a few instances of poor recovery during the termination process, one replicate not being inoculated and extremely heavy debris observed during the enumeration process. Because of these actions and observations, four replicates were considered outliers using Grubb's outlier tests and were excluded from analyses. The Grubb's outlier tests performed for each sample are provided in Appendix C.

4.4 Reference Toxicant Tests

Concurrent reference toxicant tests and control charts for both test species are provided in Appendix E. All reference toxicant tests met test acceptability criteria, and median effect (EC₅₀) concentration values for the reference toxicant tests were within $\pm$ two standard deviations of internal control chart means for both species.

5.0 REFERENCES

Anderson B.S., J.W. Hunt, M. Hester, B.M. Phillips. 1996. Assessment of sediment toxicity at the sediment-water interface. In: G.K. Ostrander (ed.) Techniques in Aquatic Toxicology. Lewis Publishers, Ann Arbor, MI.

GraphPad© Prism Software, Inc. 1992-2023. Prism, Version 10.1.1–10.1.2

SCCWRP, 2018. BIGHT'18 Toxicology Laboratory Manual. June 2018

Tidepool Scientific Software. 2009-2023. CETIS Comprehensive Toxicity Data Analysis and Database Software, Version 2.1.3.5–2.1.5.5

USEPA 1994. Methods for Assessing the Toxicity of Sediment-associated Contaminants with Estuarine and Marine Amphipods. June 1994. Environmental Protection Agency, Office of Research and Development. EPA 600/R-94/025.

USEPA 1995. Short-term methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. August 1995. Environmental Protection Agency, Office of Water. EPA 600/R-95/136.

APPENDIX A

Chain of Custody Forms and Sample Receipt Information

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

Client: WSP - SD Bay - Se. shallow
Project Name: 2023 Regional Harbor Monitoring Program #1
Test ID Numbers: 23-08-030 to -041
Test Type/Organism: Amphipod + Mussel

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
B23-12000	23-S019	8/3/23 1250	8/4/23 1550	7L	15.6	Brown sed w/ eel grass	30.5	7.42
B23-12001	23-S020	8/3/23 1610	8/4/23 1550	8L	14.8	Brown sed	33.9	7.44
B23-12002	23-S021	8/3/23 1020	8/4/23 1550	5L	16.7	Brown/black sed w/ eel grass	30.2	7.48
B23-12148	23-S022	8/3/23 1425	8/4/23 1550	7L	15.4	Light brown sed 31.8	34.8	7.47
B23-12005	23-S023	8/3/23 0955	8/4/23 1550	6L	13	Dark brown/black coarse w/ shell hash	34.8	7.41
B23-12150	23-S024	8/3/23 1330	8/4/23 1550	6L	17.8	Dark brown/black	33.2	7.39

Samples checked-in by: AG

Samples shipped via: corner

Control sediment used: Eol. Hore sed

Samples seived by: AG/JF Date: 8/10 & 8/11 Screen Size: 1mm

Additional Analysis:

Porewater: (y) collected by AG

Ammonia:

Other:

Test Organism	Supplier	Receipt Date	Condition	Initials
M. galloprovincialis	NWC/Mission Bay	8/16/23	good	AG
E. estuarius	NWA	8/9/23	good	AG

Additional Comments: Ⓢ Sulphur odor

Initial QC: AG 12/1/23

Final Review: JF

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

Client: WSP
Project Name: 2023 Regional Harbor Monitoring Program #1
Test ID Numbers: _____
Test Type/Organism: _____

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
<u>Sail Bay GSC sed</u>	<u>23-S026</u>	<u>8/13/23 0916</u>	<u>8/13/23 1200</u>	<u>~20 L</u>	<u>18.8</u>	<u>black/brown sed.</u>	<u>33.5</u>	<u>7.46</u>

Samples checked-in by:

Samples shipped via:

Control sediment used:

Samples seived by: _____ Date: _____ Screen Size: _____

Additional Analysis:

Porewater: Y / NH₃ = 1.2 @ check-in

Ammonia: Y /

Other: _____

Test Organism	Supplier	Receipt Date	Condition	Initials
<u>M. guttatus</u>				
<u>E. estuarius</u>	<u>NWP</u>	<u>8/19/23</u>	<u>good</u>	<u>AB</u>

Additional Comments:

Initial QC: JS

Final Review: SI



WSP Environmental Toxicology Lab
 4905 Morena Blvd, Ste. 1304
 San Diego, CA 92117
 Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To: Company <u>WSP USA Environment and Infrastructure Inc.</u> Address <u>9177 Sky Park Ct.</u> <u>San Diego, CA 92123</u> Contact/PM <u>Chris Stransky, Marisa Swiderski</u> Phone Number <u>858-775-5547; 808-772-8740</u> Email Address <u>chris.stransky@wsp.com, marisa.swiderski@wsp.com</u>			Project Information (if needed): Project Name <u>2023 Regional Harbor Monitoring Program</u> Project No. <u>2215100802.0003</u> PO Number <u>N/A</u> Personal Cooler Shipped: _____ Return Requested: YES <u>X</u> NO _____			Analysis Requested (write out or use codes below)					Receipt Temp (°C)
						<i>Eohaustorius estuarius</i> 10-day amphipod survival test	48-hour <i>Mytilus</i> <i>galloprovincialis</i> embryo sediment-water interface test				
Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)						
B23-12000	8/3/2023	1250	7L	Comp		X	X			15.6	
B23-12001	8/3/2023	1610	8L	Comp		X	X			14.8	
B23-12002	8/3/2023	1020	5L	Comp		X	X			16.7	
B23-12148	8/3/2023	1425	7L	Comp		X	X			15.4	
B23-12005	8/4/2023	0955	6L	Comp		X	X			13	
B23-12150	8/4/2023	1330	6L	Comp		X	X			17.8	
Samples Collected By: John Rudolph, Nick Jernack			Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.			Samples Shipped via: Condition Upon Receipt:					
Relinquished/Shipped By: Signature: <u>Marisa Swiderski</u> Print Name: <u>Marisa Swiderski</u> Date/Time: <u>8/4/2023 1550</u>			Received By: Signature: <u>Hannah Kranz</u> Print Name: <u>Hannah Kranz</u> Date/Time: <u>8/4/23 1530</u>			Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____			Received By: Signature: _____ Print Name: _____ Date/Time: _____		

Test Codes (marine):

Mp-c: Chronic Kelp	Mb-a: Acute Menidia/Silverside	Sp-c: Chronic Urchin Fertilization
Hr-dv: Chronic Abalone	Mb-c: Chronic Menidia/Silverside	Sp-dv: Chronic Urchin Development
Aa-a: Acute Topsmelt	Ab-a: Acute Mysid Shrimp	Ms-dv: Chronic Mussel Development
Aa-c: Chronic Topsmelt	Ab-c: Chronic Mysid Shrimp	Other: Write out the test organism

Test Codes (freshwater):

Cd-a: Acute Ceriodaphnia	Sc-c: Chronic Green Algae
Cd-c: Chronic Ceriodaphnia	Ha-a: Acute Hyalella amphipod
Pp-a: Acute Fathead Minnow	Ha-c: Chronic Hyalella amphipod
Pp-c: Chronic Fathead Minnow	T-22: CA Title 22 Hazardous Waste



WSP Environmental Lab (formerly Wood)
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117
Phone: (858) 299-5368

Chain of Custody Form

Page ____ of ____

Client/Send Report To: Company <u>WSP</u> Address <u>4905 Morena Blvd, Ste. 1304</u> Contact/PM <u>Alexander Gabriel / Chris Stansky</u> Phone Number <u>612-615-5777</u> Email Address <u>alexander.gabriel@wsp.com</u>			Project Information (if needed): Project Name _____ Project No. _____ PO Number _____ Personal Cooler Shipped: _____ Return Requested: YES _____ NO _____			Analysis Requested (write out or use codes below)						Receipt Temp (°C) 18.8
Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)							
Sail Bay brain size control	8/13/23	0915	~20L	Grab	23-5026							
Samples Collected By: <u>AG/BCS</u>		Additional Comments:				Samples Shipped via:						
						Condition Upon Receipt:						
Relinquished/Shipped By: Signature: <u>Alexander Gabriel</u> Print Name: <u>Alexi Gabriel</u> Date/Time: <u>8/13/23 1200</u>		Received By: Signature: <u>Jacob Fletcher</u> Print Name: <u>Jacob Fletcher</u> Date/Time: <u>8/13/23 1200</u>		Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____		Received By: Signature: _____ Print Name: _____ Date/Time: _____						

Test Codes (marine):

Mp-c: Chronic Kelp
Hr-d: Chronic Abalone
Aa-a: Acute Topsmelt
Aa-c: Chronic Topsmelt
Mb-a: Acute Menidia/Silverside
Mb-c: Chronic Menidia/Silverside
Ab-a: Acute Mysid Shrimp
Ab-c: Chronic Mysid Shrimp
Sp-c: Chronic Urchin Fertilization
Sp-d: Chronic Urchin Development
Mg-d: Chronic Mussel Development
Other: Write out the test organism

Test Codes (freshwater):

Cd-a: Acute Ceriodaphnia
Cd-c: Chronic Ceriodaphnia
Pp-a: Acute Fathead Minnow
Pp-c: Chronic Fathead Minnow
Sc-c: Chronic Green Algae
Ha-a: Acute Hyalella amphipod
Ha-c: Chronic Hyalella amphipod
T-22: CA Title 22 Hazardous Waste

Unionized Ammonia Calculation for Pressure of 1 atm														
Input 'Shaded' data														

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

Client: WSP - oceanside
Project Name: PHMP 2023
Test ID Numbers: 23-08-046 to 049 and 051 to 068
Test Type/Organism: Ecol Sed, Mg-SW

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
B23-12059	23-S031	8/18/23 1225	8/18/23 1600	9 L	11.8	gritty, black brn, no odor	33.1	7.39
B23-12060	23-S032	8/18/23 1105	8/18/23 1600	11 L	12.9	Clay, black/brn, no odor	33.1	7.32
B23-12061	23-S033	8/18/23 1545	8/18/23 1600	11 L	11.8	clay, fine, brn/black, no odor	33.7	7.31
B23-12062	23-S034	8/18/23 1425	8/18/23 1600	11 L	13.8	clay/fines, blk/brown, no odor	33.3	7.63

Samples checked-in by: RV/JF/AK
Samples shipped via: Courier (MS/BLS)
Control sediment used: Ecol Home Sediment
Samples seived by: AK/JF Date: 8/19/23 Screen Size: 1mm

Additional Analysis:

Porewater:

Ammonia: 12060: 3.3 mg/L 12062: 8.6 mg/L
Other: 12059: 7.8 mg/L
NH3: 12061: 9.6 mg/L

Test Organism	Supplier	Receipt Date	Condition	Initials
<u>E. estuarius</u>	<u>NWA</u>	<u>8/17/23</u>	<u>good</u>	<u>RV/HK</u>
<u>M. galloprovincialis</u>	<u>SIO/Mission Bay</u>	<u>8/29/23</u>	<u>good</u>	<u>AG</u>

Additional Comments:

Initial QC: AG 12/16/23
Final Review: JF 12/20/23

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

Client: WSP - Dana Point
Project Name: RHMP 2023
Test ID Numbers: 23-08-042 to 045 and 061 to 064
Test Type/Organism: Eon - sed, Mg - SWI

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
B23-12063	23-S027	8/17/23 1035	8/17/23 2025	9L	2.0	Sandy, rocky	33.6	7.65
B23-12064	23-S028	8/17/23 1605	8/17/23 2025	10L	10.0	Wet clay like, thick	33.5	7.67
B23-12065	23-S029	8/17/23 1230	8/17/23 2025	10L	10.0	Wet, fine screen ^{RV} medium ^{RV} gritty ^{RV}	33.6	7.36
B23-12066	23-S030	8/17/23 1445	8/17/23 2025	8L	10.0	muddy, silty, ^{RV} gritty	33.5	7.65

Samples checked-in by: RV/JF/HK
Samples shipped via: Courier → MS/BCS
Control sediment used: organism home sediment
Samples seived by: HK/JF Date: 8/18/23 Screen Size: 1mm

Additional Analysis:

Porewater: Y
Ammonia: RV 03: <1.00 05: 1.06
Other: 04: 1.20 06: 1.10
by RV 8/18/23

Test Organism	Supplier	Receipt Date	Condition	Initials
E. estuarius	NWA	8/17/23	good	RV/HK
m. gallinoprovialis	Field collected / <u>SIO/Mission Bay</u>	8/29/23	good	AG

Additional Comments:

Initial QC: AG 12/16/23
Final Review: JF 12/20/23



WSP Environmental Toxicology Lab
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117
Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To: Company <u>WSP USA Environment and Infrastructure Inc.</u> Address <u>9177 Sky Park Ct.</u> <u>San Diego, CA 92123</u> Contact/PM <u>Chris Stransky, Marisa Swiderski</u> Phone Number <u>858-775-5547; 808-772-8740</u> Email Address <u>chris.stransky@wsp.com, marisa.swiderski@wsp.com</u>			Project Information (if needed): Project Name <u>2023 Regional Harbor Monitoring Program</u> Project No. <u>2215100802.0003</u> PO Number <u>N/A</u> Personal Cooler Shipped: _____ Return Requested: YES <u>X</u> NO _____			Analysis Requested (write out or use codes below)					Receipt Temp (°C)
						<i>Eohaustorius estuarius</i> 10-day amphipod survival test	48-hour <i>Mytilus galloprovincialis</i> embryo sediment-water interface test				
Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)						
B23-12059	8/18/2023	1225	9L	Comp		X	X				11.8
B23-12060	8/18/2023	1105	11L	Comp		X	X				12.9
B23-12061	8/18/2023	1545	11L	Comp		X	X				16.8
B23-12062	8/18/2023	1425	11L	Comp		X	X				13.8
Samples Collected By: Marisa Swiderski		Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.					Samples Shipped via: Condition Upon Receipt:				
Relinquished/Shipped By: Signature: <u>Marisa Swiderski</u> Print Name: <u>Marisa Swiderski</u> Date/Time: <u>8/18/2023 1800</u>		Received By: Signature: <u>Hannah Kranz</u> Print Name: <u>Hannah Kranz</u> Date/Time: <u>8/18/2023 1800</u>			Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____			Received By: Signature: _____ Print Name: _____ Date/Time: _____			

Test Codes (marine):

Mp-c: Chronic Kelp
Hr-dv: Chronic Abalone
Aa-a: Acute Topsmelt
Aa-c: Chronic Topsmelt
Mb-a: Acute Menidia/Silverside
Mb-c: Chronic Menidia/Silverside
Ab-a: Acute Mysid Shrimp
Ab-c: Chronic Mysid Shrimp
Sp-c: Chronic Urchin Fertilization
Sp-dv: Chronic Urchin Development
Ms-dv: Chronic Mussel Development
Other: Write out the test organism

Test Codes (freshwater):

Cd-a: Acute Ceriodaphnia
Cd-c: Chronic Ceriodaphnia
Pp-a: Acute Fathead Minnow
Pp-c: Chronic Fathead Minnow
Sc-c: Chronic Green Algae
Ha-a: Acute Hyalella amphipod
Ha-c: Chronic Hyalella amphipod
T-22: CA Title 22 Hazardous Waste



WSP Environmental Toxicology Lab
 4905 Morena Blvd, Ste. 1304
 San Diego, CA 92117
 Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To: Company <u>WSP USA Environment and Infrastructure Inc.</u> Address <u>9177 Sky Park Ct.</u> <u>San Diego, CA 92123</u> Contact/PM <u>Chris Stransky, Marisa Swiderski</u> Phone Number <u>858-775-5547; 808-772-8740</u> Email Address <u>chris.stransky@wsp.com, marisa.swiderski@wsp.com</u>			Project Information (if needed): Project Name <u>2023 Regional Harbor Monitoring Program</u> Project No. <u>2215100802.0003</u> PO Number <u>N/A</u> Personal Cooler Shipped: _____ Return Requested: YES <u>X</u> NO _____			Analysis Requested (write out or use codes below)					Receipt Temp (°C)
						<i>Eohaustorius estuarius</i> 10-day amphipod survival test	48-hour <i>Mytilus galloprovincialis</i> embryo sediment-water interface test				
Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)						
B23-12063	8/17/2023	1035	9L	Comp		X	X			2.0	
B23-12064	8/17/2023	1605	10L	Comp		X	X			6.0	
B23-12065	8/17/2023	1230	10L	Comp		X	X			6.0	
B23-12066	8/17/2023	1445	8L	Comp		X	X			6.0	
Samples Collected By: Marisa Swiderski		Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.				Samples Shipped via: Condition Upon Receipt:					
Relinquished/Shipped By: Signature: <u>Marisa Swiderski</u> Print Name: <u>Marisa Swiderski</u> Date/Time: <u>8/17/2023 2025</u>		Received By: Signature: <u>Riley von Richter</u> Print Name: <u>Riley von Richter</u> Date/Time: <u>8/17/23 2025</u>		Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____		Received By: Signature: _____ Print Name: _____ Date/Time: _____					

Test Codes (marine):

Mp-c: Chronic Kelp Mb-a: Acute Menidia/Silverside Sp-c: Chronic Urchin Fertilization
 Hr-dv: Chronic Abalone Mb-c: Chronic Menidia/Silverside Sp-dv: Chronic Urchin Development
 Aa-a: Acute Topsmelt Ab-a: Acute Mysid Shrimp Ms-dv: Chronic Mussel Development
 Aa-c: Chronic Topsmelt Ab-c: Chronic Mysid Shrimp Other: Write out the test organism

Test Codes (freshwater):

Cd-a: Acute Ceriodaphnia Sc-c: Chronic Green Algae
 Cd-c: Chronic Ceriodaphnia Ha-a: Acute Hyalella amphipod
 Pp-a: Acute Fathead Minnow Ha-c: Chronic Hyalella amphipod
 Pp-c: Chronic Fathead Minnow T-22: CA Title 22 Hazardous Waste

B23_Eoh Site Check-in (day-1)Unionized Complete.xls

Unionized Ammonia Calculation for Pressure of 1 atm														
Input 'Shaded' data														
</														

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

Client: WSP

Project Name: RHMP 2023 - Mission Bay

Test ID Numbers: 23-08-052 to 060/061 to 077

Test Type/Organism: Eoh - sed, Mj - SWI

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
B23-12022	23-S035	8/13/23 0925	8/23/23 0425	8L	5.5	dark grey/brown, sandy, sand dollar	33.2	7.69
B23-12023	23-S038	8/22/23 0945	8/22/23 1715	8L	14.9	brown clay w/ some eel grass	33.2	7.40
B23-12058	23-S039	8/22/23 0835	8/22/23 1715	9L	13.7	dark black/brown heavy eel grass	33.4	7.71
B23-12024	23-S040	8/22/23 1445	8/22/23 1715	10L	13.8	brown sed. organic debris	33.9	7.84
B23-12025	23-S041	8/22/23 1345	8/22/23 1715	8L	9.5	black sed. strong sulphur color	33.0	7.83
B23-12026	23-S042	8/22/23 1155	8/22/23 1715	7L	11.7	clay like, black eel grass	32.6	7.48
B23-23137	23-S043							
B23-12055	23-S044	8/22/23 1555	8/22/23 1715	8L	21.8	clay like black/brown	33.8	7.71
B23-12056	23-S045	8/23/23 0745	8/23/23 0745	11L	5.3	dark, clay like, eel grass material	33.5	7.77
B23-12057	23-S046	8/22/23 1045	8/22/23 1715	9L	7.7	thin, debris, clay, gooey, drk brown	33.4	7.53

Samples checked-in by:

Samples shipped via:

Control sediment used: Eoh Home Sediment

Samples seived by: KYB/HK Date: 8/23/23 Screen Size: 1mm
AG/JF

Additional Analysis:

Porewater:

Ammonia: see ammonia check in data sheet

Other:

Test Organism	Supplier	Receipt Date	Condition	Initials
<u>E. estuarius</u>	<u>Northwest Amplified</u>	<u>8/17/23</u>	<u>good</u>	<u>AG</u>
<u>M. gal</u>	<u>Field collected</u>	<u>8/29/23</u>	<u>good</u>	<u>JS</u>

Additional Comments:

Initial QC: JS

Final Review: JS



WSP Environmental Toxicology Lab
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117
Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To:			Project Information (if needed):			Analysis Requested (write out or use codes below)					Receipt Temp (°C)	
Company <u>WSP USA Environment and Infrastructure Inc.</u>			Project Name <u>2023 Regional Harbor Monitoring Program</u>			<i>Eohaustorius estuarius</i> 10-day amphipod survival test	<i>48-hour Mytilus galloprovincialis</i> embryo sediment-water interface test					
Address <u>9177 Sky Park Ct.</u>			Project No. <u>2215100802.0003</u>									
<u>San Diego, CA 92123</u>			PO Number <u>N/A</u>									
Contact/PM <u>Chris Stransky, Marisa Swiderski</u>			Personal Cooler Shipped:									
Phone Number <u>858-775-5547; 808-772-8740</u>			Return Requested: YES <u>X</u> NO <u> </u>									
Email Address <u>chris.stransky@wsp.com, marisa.swiderski@wsp.com</u>												
Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)							
B23-12023	8/22/2023	0945	8L	Comp				X	X			
B23-12024	8/22/2023	1445	10L	Comp				X	X			
B23-12025	8/22/2023	1345	8L	Comp				X	X			
B23-12026	8/22/2023	1155	7L	Comp		X	X					
B23-12055	8/22/2023	1555	8L	Comp		X	X					
WSP B23-12056	8/22/2023			Comp		X	X					
B23-12057	8/22/2023	1045	9L	Comp		X	X					
B23-12058	8/22/2023	0835	9L	Comp		X	X					
Samples Collected By: Marisa Swiderski			Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.			Samples Shipped via: Condition Upon Receipt:						
Relinquished/Shipped By:			Received By:			Relinquished By:						
Signature: <u>Marisa Swiderski</u>			Signature: <u>Hannah Kranz</u>			Signature: _____						
Print Name: <u>Marisa Swiderski</u>			Print Name: <u>Hannah Kranz</u>			Print Name: _____						
Date/Time: <u>8/22/2023 1715</u>			Date/Time: <u>8/22/23 1715</u>			Date/Time: _____						

Test Codes (marine):

Mp-c: Chronic Kelp **Mb-a:** Acute Menidia/Silverside **Sp-c:** Chronic Urchin Fertilization
Hr-dv: Chronic Abalone **Mb-c:** Chronic Menidia/Silverside **Sp-dv:** Chronic Urchin Development
Aa-a: Acute Topsmelt **Ab-a:** Acute Mysid Shrimp **Ms-dv:** Chronic Mussel Development
Aa-c: Chronic Topsmelt **Ab-c:** Chronic Mysid Shrimp **Other:** Write out the test organism

Test Codes (freshwater):

Cd-a: Acute Ceriodaphnia **Sc-c:** Chronic Green Algae
Cd-c: Chronic Ceriodaphnia **Ha-a:** Acute Hyalella amphipod
Pp-a: Acute Fathead Minnow **Ha-c:** Chronic Hyalella amphipod
Pp-c: Chronic Fathead Minnow **T-22:** CA Title 22 Hazardous Waste



WSP Environmental Toxicology Lab
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117
Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To:			Project Information (if needed):			Analysis Requested (write out or use codes below)					Receipt Temp (°C)																																																											
Company <u>WSP USA Environment and Infrastructure Inc.</u> Address <u>9177 Sky Park Ct.</u> <u>San Diego, CA 92123</u> Contact/PM <u>Chris Stransky, Marisa Swiderski</u> Phone Number <u>858-775-5547; 808-772-8740</u> Email Address <u>chris.stransky@wsp.com, marisa.swiderski@wsp.com</u>			Project Name <u>2023 Regional Harbor Monitoring Program</u> Project No. <u>2215100802.0003</u> PO Number <u>N/A</u> Personal Cooler Shipped: _____ Return Requested: YES <u>X</u> NO _____			<table border="1"> <tr> <td><i>Eohaustorius estuarius</i> 10-day amphipod survival test</td> <td>48-hour <i>Mytilus galloprovincialis</i> embryo sediment-water interface test</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>						<i>Eohaustorius estuarius</i> 10-day amphipod survival test	48-hour <i>Mytilus galloprovincialis</i> embryo sediment-water interface test					X	X					X	X																																													
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Relinquished/Shipped By: Signature: <u>Marisa Swiderski</u> Print Name: <u>Marisa Swiderski</u> Date/Time: <u>8/23/2023 1700</u>		Received By: Signature: <u>Hannah Kraus</u> Print Name: <u>Hannah Kraus</u> Date/Time: <u>8/23/2023 1700</u>		Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____		Received By: Signature: _____ Print Name: _____ Date/Time: _____																																																																

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Pp-a: Acute Fathead Minnow	Ha-c: Chronic Hyalella amphipod
Pp-c: Chronic Fathead Minnow	T-22: CA Title 22 Hazardous Waste

Ammonia Subsample Analysis - Porewater

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP # 3

Start Date: 8/29/2023 1100

Test No.: 23-08-052 to-060

End Date: 9/8/2023 1015

DI Blank: 17.0

10 mg/L Ammonia Stock: 94, 8.8
(x 1.22)

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check:

Final Review:

Unionized Ammonia Calculation for Pressure of 1 atm													
Input 'Shaded' data													

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

NORTH SAN DIEGO BAY

Client: WSP

Project Name: PHMP 2023

Test ID Numbers: 23-09-00170-036 (A) (-037+0-040)

Test Type/Organism: Edh 10d ; Mg-SW

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
B23-12014	23-5047	8/28/23 1025	8/28/23 1730	7L	18.5	grey/brown, shell hash, minimal odor	33.1	7.70
B23-12047	23-5048	8/28/23 1545	8/28/23 1730	7L	12.5	black/brown, organic, shell hash	32.1	7.8.12
B23-12116	23-5049	8/28/23 0905	8/28/23 1730	8L	17.4	dark black, rocky, no odor	33.0	7.56
B23-12121	23-5050	8/28/23 1205	8/28/23 1730	8L	10.9	dark brown, gritty, shell hash, no odor	33.1	7.58
B23-12122	23-5051	8/28/23 1405	8/28/23 1730	7L	8.5	grey, shell hash, organic material	33.2	7.50
B23-12048	23-5052	8/29/23 0815	8/29/23 1745	9L	5.1	grey, clay, no odor	33.4	7.65
B23-12049	23-5053	8/29/23 1040	8/29/23 1745	7L	7.7	grey/brown, chunky	33.8	7.70
B23-12050	23-5054	8/29/23 0915	8/29/23 1745	8L	6.4	light brown, thin, waxy	33.0	7.50
B23-12051	23-5055	8/29/23 1625	8/29/23 1745	9L	17.5	grey/brown, organics	33.4	7.50
B23-12841	23-5056	8/29/23 1510	8/29/23 1745	7L	11.1	grey, gritty, clastic	33.5	7.82

Samples checked-in by:

Samples shipped via:

Control sediment used:

Samples seived by: HK/PV/KJB Date: 8/30/23 Screen Size: 1mm

Additional Analysis:

Porewater: 04: 2.8 116: 10.04 122: 2.9

Ammonia: 04: 3.3 121: 50.04

Other:

Test Organism	Supplier	Receipt Date	Condition	Initials
M. gallo	Mission Bay/Whar	9/6/23	good	JF
E. estuarious	NWA	8/31/23	good	JF

Additional Comments:

(A) -037+0-040 kept in other test folder

048: 0.9
049: 1.0
050: 0.8
051: 1.2
841: 1.3 mg/L

Detection level: 0.4

Initial QC: JF 12/6/23

Final Review: JF

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

North San Diego Bay

Client: WSP

Project Name: RHMP 2013

Test ID Numbers: 23-09-001 to 23-09-040 (23-09-040)

Test Type/Organism: Eoh 10d / Mg-SW

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
B23-12053	23-S057	8/29/23 1400	8/29/23 1745	9L	5.0	brown/grey clay	33.4	7.60
B23-12054	23-S058	8/29/23 1215	8/29/23 1745	9L	8.4	blackish/brown, eelgrass, fine clay sed	33.8	7.55
Eoh Home Sediment	23-S059	8/26/23 N/A	8/30/23 1045	12L	15.2	sandy, brownish	35.5	-
B23-12019	23-S060	8/30/23 1230	8/30/23 1725	9L	5.6	brown/black sed	33.5	7.65
B23-12020	23-S061	8/30/23 1115	8/30/23 1725	10L	5.5		33.5	7.62
B23-12021	23-S062	8/30/23 1000	8/30/23 1725	7L	5.6		33.0	7.58
B23-12052	23-S063	8/30/23 0840	8/30/23 1725	7L	7.4		33.5	7.72
B23-12123	23-S064	8/30/23 1425	8/30/23 1725	9L	9.7		33.2	7.81
B23-12124	23-S065	8/30/23 1535	8/30/23 1725	10L	11.6		33.2	7.75
B23-12117	23-S066	8/31/23 8:20	8/31/23 1700	10L	5.2	Sandy, extreme shell hash	32.6	7.70

kept in other test folder

Samples checked-in by:		Additional Analysis:	
Samples shipped via:		Porewater: ✓ 8/30/23 HK	
Control sediment used:		Ammonia: ✓ 8/30/23 HK	
Samples seived by: HK/AV		Other:	
Date: 8/30/23		Screen Size: 1mm	

Test Organism	Supplier	Receipt Date	Condition	Initials
M. gallo	Hudson Bay NWL	9/6/23	good	JF
E. estuarinus	NWA	8/31/23	good	JF

Additional Comments:

NH3: 053: 2.0 mg/L
054: 1.9
019: 2.3
020: 3.1
021: 2.2
052: 2.1
123: 2.1
124: 2.4

JF DIO.0 Spike 8.8

Initial QC: JF 12/8/23
Final Review: JS



WSP Environmental Toxicology Lab
4905 Morena Blvd, Ste. 1304
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Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To:			Project Information (if needed):			Analysis Requested (write out or use codes below)				Receipt Temp (°C)
Company <u>WSP USA Environment and Infrastructure Inc.</u>			Project Name <u>2023 Regional Harbor Monitoring Program</u>			<i>Eohaustorius estuarius</i> 10-day amphipod survival test	<i>48-hour Mytilus galloprovincialis</i> embryo sediment-water interface test			
Address <u>9177 Sky Park Ct.</u>			Project No. <u>2215100802.0003</u>							
<u>San Diego, CA 92123</u>			PO Number <u>N/A</u>							
Contact/PM <u>Chris Stransky, Marisa Swiderski</u>			Personal Cooler Shipped:							
Phone Number <u>858-775-5547; 808-772-8740</u>			Return Requested: YES <u>X</u> NO <u> </u>							
Email Address <u>chris.stransky@wsp.com, marisa.swiderski@wsp.com</u>										
Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)					
B23-12014	8/28/2023	1025	7L	Comp		X	X			
B23-12047	8/28/2023	1545	7L	Comp		X	X			
B23-12116	8/28/2023	0905	8L	Comp		X	X			
B23-12121	8/28/2023	1205	8L	Comp		X	X			
B23-12122	8/28/2023	1425	7L	Comp		X	X			
Samples Collected By: Marisa Swiderski		Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.					Samples Shipped via: Condition Upon Receipt:			
Relinquished/Shipped By: Signature: <u>Marisa Swiderski</u> Print Name: <u>Marisa Swiderski</u> Date/Time: <u>8/28/2023 1730</u>		Received By: Signature: <u>Jacob Pletcher</u> Print Name: <u>Jacob Pletcher</u> Date/Time: <u>8/28/23 1730</u>			Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____			Received By: Signature: _____ Print Name: _____ Date/Time: _____		

Test Codes (marine):

Mp-c: Chronic Kelp **Mb-a:** Acute Menidia/Silverside **Sp-c:** Chronic Urchin Fertilization
Hr-dv: Chronic Abalone **Mb-c:** Chronic Menidia/Silverside **Sp-dv:** Chronic Urchin Development
Aa-a: Acute Topsmelt **Ab-a:** Acute Mysid Shrimp **Ms-dv:** Chronic Mussel Development
Aa-c: Chronic Topsmelt **Ab-c:** Chronic Mysid Shrimp **Other:** Write out the test organism

Test Codes (freshwater):

Cd-a: Acute Ceriodaphnia **Sc-c:** Chronic Green Algae
Cd-c: Chronic Ceriodaphnia **Ha-a:** Acute Hyalella amphipod
Pp-a: Acute Fathead Minnow **Ha-c:** Chronic Hyalella amphipod
Pp-c: Chronic Fathead Minnow **T-22:** CA Title 22 Hazardous Waste



WSP Environmental Toxicology Lab
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Chain of Custody Form

Page 1 of 1

Client/Send Report To:			Project Information (if needed):			Analysis Requested (write out or use codes below)					Receipt Temp (°C)					
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Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)											
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B23-12051	8/29/2023	1625	9L	Comp		X	X									
B23-12841	8/29/2023	1510	7L	Comp		X	X									
B23-12054	8/29/2023	1215	9L	Comp		X	X									
B23-12053	8/29/2023	1400	9L	Comp		X	X									
Samples Collected By: Marisa Swiderski		Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.				Samples Shipped via: Condition Upon Receipt:										
Relinquished/Shipped By: Signature: <u>Marisa Swiderski</u> Print Name: <u>Marisa Swiderski</u> Date/Time: <u>8/29/2023 1745</u>		Received By: Signature: <u>Hannah Kranz</u> Print Name: <u>Hannah Kranz</u> Date/Time: <u>8/29/23 1745</u>		Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____		Received By: Signature: _____ Print Name: _____ Date/Time: _____										

Test Codes (marine):

Mp-c: Chronic Kelp
Hr-dv: Chronic Abalone
Aa-a: Acute Topsmelt
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Mb-a: Acute Menidia/Silverside
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Ab-a: Acute Mysid Shrimp
Ab-c: Chronic Mysid Shrimp
Sp-c: Chronic Urchin Fertilization
Sp-dv: Chronic Urchin Development
Ms-dv: Chronic Mussel Development
Other: Write out the test organism

Test Codes (freshwater):

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Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)						
B23-12019	8/30/2023	1230	9L	Comp		X	X				5.6
B23-12020	I	1115	10L	Comp		X	X				5.5
B23-12021		1000	7L	Comp		X	X				5.6
B23-12052		0840	7L	Comp		X	X				7.4
B23-12123		1425	9L	Comp		X	X				9.7
B23-12124		1535	10L	Comp		X	X				11.6
Samples Collected By:			Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.						Samples Shipped via:		
Marisa Swiderski									Condition Upon Receipt:		
Relinquished/Shipped By:			Received By:			Relinquished By:			Received By:		
Signature: <u>Marisa Swiderski</u>			Signature: <u>Alex Gabriel</u>			Signature: _____			Signature: _____		
Print Name: <u>Marisa Swiderski</u>			Print Name: <u>Alex Gabriel</u>			Print Name: _____			Print Name: _____		
Date/Time: <u>8/30/2023 1725</u>			Date/Time: <u>8/30/23 1725</u>			Date/Time: _____			Date/Time: _____		

Test Codes (marine):

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Ha-a: Acute Hyalella amphipod
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T-22: CA Title 22 Hazardous Waste

Unionized Ammonia Calculation for Pressure of 1 atm														
Input 'Shaded' data														
I														
pK														
1														
2														
3														
4														
5														
6														
7														
8														
9.26														
9.27														
9.28														
9.29														
9.30														
9.32														
9.33														
9.34														
Eoh RHMP #4 Porewater	Log Number	vial	Day	Dilution	Total Ammonia (mg/L)	Temp (C)	Salinity (ppt)	pH	Temp (K)	I	I Rounded	pK	Unionized Ammonia	D.O. (mg/L)
	B23-12014		-1	-88	2.80	8.5	33.1	7.70	281.66	7.32	1	9.26	0.023	
	B23-12047		-1	-88	3.30	12.5	32.1	8.12	285.66	7.11	1	9.26	0.093	
	B23-12116		-1	-88	0.04	17.4	33.0	7.56	290.56	7.30	1	9.26	0.000	
	B23-12121		-1	-88	0.04	10.9	33.1	7.58	284.06	7.32	1	9.26	0.000	
	B23-12122		-1	-88	2.90	8.5	33.2	7.50	281.66	7.34	1	9.26	0.015	
	B23-12048		-1	-88	0.90	5.1	33.4	7.65	278.26	7.39	1	9.26	0.005	
	B23-12049		-1	-88	1.00	7.7	33.8	7.76	280.86	7.47	1	9.26	0.009	
	B23-12050		-1	-88	0.80	6.4	33.6	7.56	279.56	7.43	1	9.26	0.004	
	B23-12051		-1	-88	1.20	17.5	33.4	7.50	290.66	7.39	1	9.26	0.012	
	B23-12841		-1	-88	1.30	11.1	33.5	7.82	284.26	7.41	1	9.26	0.017	
	B23-12053		-1	-88	2.00	5.0	33.4	7.60	278.16	7.39	1	9.26	0.010	
	B23-12054		-1	-88	1.90	8.4	33.8	7.55	281.56	7.47	1	9.26	0.011	
	B23-12019		-1	-88	2.30	5.6	33.5	7.65	278.76	7.41	1	9.26	0.013	
	B23-12020		-1	-88	3.10	5.5	33.5	7.62	278.66	7.41	1	9.26	0.017	
	B23-12021		-1	-88	2.20	5.6	33.0	7.58	278.76	7.30	1	9.26	0.011	
	B23-12052		-1	-88	2.10	7.4	33.5	7.72	280.56	7.41	1	9.26	0.016	
	B23-12123		-1	-88	2.10	9.7	33.2	7.81	282.86	7.34	1	9.26	0.024	
	B23-12124		-1	-88	2.40	11.6	33.2	7.75	284.76	7.34	1	9.26	0.027	
Data Check: NJ														
QC: RV														

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

Central San Diego Bay

Client: WSP

Project Name: RHMP 2023

Test ID Numbers: 23-09-047 to 23-09-063

Test Type/Organism: 10d Amphipod, Mussel-Suit

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
North SD Bay B23-12114	23-S070	8/31/23 1515	8/31/23 1700	7.5L	7.4	SOUPY brn grey	34.6	7.85
B23-12115	23-S071	8/31/23 1410	8/31/23 1700	8L	5.3	moderate shell hash, brn grey	32.0	7.88
Central SD Bay B23-12009	23-S072	9/1/23 1230	9/1/23 1450	8L	8.5	brown, SOUPY, fine	33.9	7.58
B23-12010	23-S073	9/1/23 1110	9/1/23 1450	7L	10.5	BROWN, thin liquidy	33.7	7.63
B23-12011	23-S074	9/1/23 0950	9/1/23 1450	7L	4.9	grey, brown, fine, NO debris	33.6	7.62
B23-12012	23-S075	9/1/23 0840	9/1/23 1450	7.5L	9.1	thick, brown, sandy	33.5	7.59
North SD Bay B23-12117	23-S066	8/31/23 1210	8/31/23 1700	10L	5.2	sandy, extreme shell hash	32.6	7.70
B23-12118	23-S067	8/31/23 1050	8/31/23 1700	8L	6.7	grey, shell hash, clay-like	32.0	7.85
B23-12119	23-S068	8/31/23 0945	8/31/23 1700	8L	5.1	slight shell hash, grey, liquidy	31.9	7.82
B23-12120	23-S069	8/31/23 0820	8/31/23 1700	8L	8.0	brown-grey, liquidy, NO debris	32.6	7.74

Samples checked-in by: EV/HK

Samples shipped via:

Control sediment used:

Samples seived by: EV/HK Date: 9/1/23 Screen Size: 1mm

Additional Analysis:

Porewater: ✓ 9/1/23 EV/HK

Ammonia: ✓ 9/1/23 EV/HK

Other:

Test Organism	Supplier	Receipt Date	Condition	Initials
E. estuarius	NWA	8/31/23	good	AG
M. galloprovincialis	NWA/Mission Bay	9/1/23	good	AG

Additional Comments:

NH₃ 114: 2.850
DI: 2.0 115: 8.66
Spike: 10.0
NH₃ 09: 1.4
10: 1.7
11: 1.2
12: 1.0

Initial QC: AG 12/14/23

Final Review: [Signature]

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

North San Diego Bay

Client: WSP

Project Name: RIMP 2023

Test ID Numbers: 23-09-00140-036 (-037-040) (A)

Test Type/Organism: Eoh 10d; Mg-SWI

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
B23-12118	23-5067	8/31/23 1050	8/31/23 1700	8L	6.7	grey, shell hash, claylike	32.0	7.85
B23-12119	23-5068	8/31/23 0945	8/31/23 1700	8L	5.1	slight shell hash, thin grey	31.9	7.82
B23-12120	23-5069	8/31/23 0920	8/31/23 1700	8L	8.0	grey brown thin debris	32.6	7.74

kept in
other
test folder (A)

Samples checked-in by:

Samples shipped via:

Control sediment used:

Samples seived by: RV/HK Date: 9/1/23 Screen Size: 1mm
+117

Additional Analysis:

Porewater: ✓ 9/1/23

Ammonia: ✓ 9/1/23

Other:

DI: 0.0 NH₃ SWI 10.0

NH₃'s done 9/1/23 by HK

Test Organism	Supplier	Receipt Date	Condition	Initials
M. gallo	NWA			
E. estuarious	Mission Bay / NWC			

117: 2.3
118: 2.07
119: 1.95
120: 2.08

Additional Comments:

Initial QC: JF 12/18/23

Final Review: WSA

WSP Environmental Toxicology Lab
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117
Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To:

Company WSP USA Environment and Infrastructure Inc.
Address 9177 Sky Park Ct.
San Diego, CA 92123
Contact/PM Chris Stransky, Marisa Swiderski
Phone Number 858-775-5547; 808-772-8740
Email Address chris.stransky@wsp.com, marisa.swiderski@wsp.com

Project Information (if needed):

Project Name 2023 Regional Harbor Monitoring Program
Project No. 2215100802.0003
PO Number N/A

Personal Cooler Shipped:

Return Requested: YES X NO

Analysis Requested

(write out or use codes below)

Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)	<i>Eohaustorius estuarius</i> 10-day amphipod survival test	<i>48-hour Mytilus galloprovincialis</i> embryo sediment-water interface test				Receipt Temp (°C)
B23-12117	8/31/2023	1210	10L	Comp		X	X				
B23-12118	8/31/2023	1050	8L	Comp		X	X				
B23-12119	8/31/2023	0945	8L	Comp		X	X				
B23-12120	8/31/2023	0820	8L	Comp		X	X				
B23-12115	8/31/2023	1410	8L	Comp		X	X				
B23-12114	8/31/2023	1515	7.5L	Comp		X	X				

Samples Collected By:

Marisa Swiderski

Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.

Samples Shipped via:

Condition Upon Receipt:

Relinquished/Shipped By:

Signature: Marisa Swiderski
Print Name: Marisa Swiderski
Date/Time: 8/31/2023 1700

Received By:

Signature: Riley von Richter
Print Name: Riley von Richter
Date/Time: 8/31/2023 1700

Relinquished By:

Signature:
Print Name:
Date/Time:

Received By:

Signature:
Print Name:
Date/Time:

Test Codes (marine):

Mp-c: Chronic Kelp Mb-a: Acute Menidia/Silverside Sp-c: Chronic Urchin Fertilization
Hr-dv: Chronic Abalone Mb-c: Chronic Menidia/Silverside Sp-dv: Chronic Urchin Development
Aa-a: Acute Topsmelt Ab-a: Acute Mysid Shrimp Ms-dv: Chronic Mussel Development
Aa-c: Chronic Topsmelt Ab-c: Chronic Mysid Shrimp Other: Write out the test organism

Test Codes (freshwater):

Cd-a: Acute Ceriodaphnia Sc-c: Chronic Green Algae
Cd-c: Chronic Ceriodaphnia Ha-a: Acute Hyalella amphipod
Pp-a: Acute Fathead Minnow Ha-c: Chronic Hyalella amphipod
Pp-c: Chronic Fathead Minnow T-22: CA Title 22 Hazardous Waste



WSP Environmental Toxicology Lab
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117
Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To: Company <u>WSP USA Environment and Infrastructure Inc.</u> Address <u>9177 Sky Park Ct.</u> <u>San Diego, CA 92123</u> Contact/PM <u>Chris Stransky, Marisa Swiderski</u> Phone Number <u>858-775-5547; 808-772-8740</u> Email Address <u>chris.stransky@wsp.com, marisa.swiderski@wsp.com</u>			Project Information (if needed): Project Name <u>2023 Regional Harbor Monitoring Program</u> Project No. <u>2215100802.0003</u> PO Number <u>N/A</u> Personal Cooler Shipped: _____ Return Requested: YES <u>X</u> NO _____.			Analysis Requested (write out or use codes below)					Receipt Temp (°C)
						<i>Eohaustorius estuarius</i> 10-day amphipod survival test	48-hour <i>Mytilus</i> <i>galloprovincialis</i> embryo sediment-water interface test				
						X	X				
						X	X				
						X	X				
						X	X				
Samples Collected By: Marisa Swiderski			Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.			Samples Shipped via: Condition Upon Receipt:					
Relinquished/Shipped By: Signature: <u>Marisa Swiderski</u> Print Name: <u>Marisa Swiderski</u> Date/Time: <u>9/1/2023 1450</u>			Received By: Signature: <u>Hannah Kranz</u> Print Name: <u>Hannah Kranz</u> Date/Time: <u>9/1/2023 1450</u>			Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____					Received By: Signature: _____ Print Name: _____ Date/Time: _____

Test Codes (marine):

Mp-c: Chronic Kelp **Mb-a:** Acute Menidia/Silverside **Sp-c:** Chronic Urchin Fertilization
Hr-dv: Chronic Abalone **Mb-c:** Chronic Menidia/Silverside **Sp-dv:** Chronic Urchin Development
Aa-a: Acute Topsmelt **Ab-a:** Acute Mysid Shrimp **Ms-dv:** Chronic Mussel Development
Aa-c: Chronic Topsmelt **Ab-c:** Chronic Mysid Shrimp **Other:** Write out the test organism

Test Codes (freshwater):

Cd-a: Acute Ceriodaphnia **Sc-c:** Chronic Green Algae
Cd-c: Chronic Ceriodaphnia **Ha-a:** Acute Hyalella amphipod
Pp-a: Acute Fathead Minnow **Ha-c:** Chronic Hyalella amphipod
Pp-c: Chronic Fathead Minnow **T-22:** CA Title 22 Hazardous Waste

Unionized Ammonia Calculation for Pressure of 1 atm															
Input 'Shaded' data															

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

Client: WSP - RHMP
Project Name: Baynet 23 - SD Bay Centre 1
Test ID Numbers: 23-09-064 to 077
Test Type/Organism: Ech

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
B23-12099	23-5076	9/5/23 1520	9/5/23 1807	6 L	19.8	dark brown, smooth, w/ shell hash	33.2	8.16
B23-12103	23-5077	9/5/23 1415	9/5/23 1807	7.5 L	15.0	brown, fine, slight shell hash	33.3	7.87
B23-12107	23-5078	9/5/23 1325	9/5/23 1807	8 L	9.1	grey, fine, slight shell hash	33.4	7.48
B23-12109	23-5079	9/5/23 0915	9/5/23 1807	8 L	9.0	slight shell hash, grey, trash	32.1	7.90
B23-12110	23-5080	9/5/23 1025	9/5/23 1807	7 L	8.9	brown, grey, trash, shells	33.4	7.93
B23-12155	23-5081	9/5/23 1135	9/5/23 1807	9 L	6.6	black, organic, very strong sulfur	33.4	7.93
B23-12098	23-5082	9/5/23 1610	9/5/23 1807	9 L	9.8	fine, grey, trash	33.8	7.88

NH₃ mg/L

<0.4

<0.4

1.09

0.976

0.976

7.25/18.3

2.0

Samples checked-in by:

Samples shipped via:

Control sediment used:

Samples seived by: HL/B/K/B Date: 9/10/23 Screen Size: 1mm

Additional Analysis:

Porewater:

Ammonia: detection level 0.4 mg/L

Other:

NH₃-N

Test Organism	Supplier	Receipt Date	Condition	Initials
E-Estuarinus	ABS		Good	AB
M. g. 91	In house		Good	AB

Additional Comments:

Initial QC: RV 12/21/23

Final Review: [Signature]

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

Client: WSP
Project Name: KHMP 2023
Test ID Numbers: 23-09-064 to 077
Test Type/Organism: 10d Edh / Mg-SW1

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
B23-12093	23-S083	9/6/23 1350	9/6/23 1830	10L	10.4	grey/brown, sandy, aragonite shells	34.1	7.76
B23-12095	23-S084	1205	1830	8L	7.4	grey/brown, sandy, slight aragonite	34.2	7.94
B23-12096	23-S085	1055	1830	9L	13.9	grey/brown, thick minimal debris	33.7	7.13
B23-12097	23-S086	0940	1830	8L	8.1	thick grainy sandy, large debris	33.9	7.92
B23-12102	23-S087	0830	1830	8L	10.8	brown, very muddy	34.0	7.82
B23-12091	23-S088	9/6/23 1430	9/6/23 1830	9L	22.4	grey/brown, organic material	34.0	7.84
B23-12003	23-S089	1530	1830	8L	11.9	grey/brown, organic material	34.2	7.75

Samples checked-in by: JF

Samples shipped via: WSP courier

Control sediment used:

Samples seived by: RV/KYB Date: 9/7/23 Screen Size: 1mm

Additional Analysis:

Porewater: 19/7/23 RV

Ammonia: ✓ 9/7/23 RV

Other:

Test Organism	Supplier	Receipt Date	Condition	Initials
<u>E. estuaries</u>	<u>ABS</u>		<u>Good</u>	<u>AB</u>
<u>M. galliparamidis</u>	<u>In-house</u>		<u>Good</u>	<u>AB</u>

Additional Comments:

$$\begin{array}{r} \text{NH}_3 \\ \hline 0.0 \end{array} \quad \begin{array}{r} \text{S} \\ \hline 9.0 \end{array}$$

93-1.5 102-1.0
95-1.3 91-20.4
96-2.3 03-0.7
97-1.5

Initial QC: RV 12/21/23

Final Review: mon



WSP Environmental Toxicology Lab
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117
Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To:			Project Information (if needed):			Analysis Requested (write out or use codes below)					Receipt Temp (°C)
Company	WSP USA Environment and Infrastructure Inc.		Project Name	2023 Regional Harbor Monitoring Program		Eohaustorius estuarius 10-day amphipod survival test	48-hour Mytilus galloprovincialis embryo sediment-water interface test				
Address	9177 Sky Park Ct. San Diego, CA 92123		Project No.	2215100802.0003							
Contact/PM	Chris Stransky, Marisa Swiderski		PO Number	N/A							
Phone Number	858-775-5547; 808-772-8740		Personal Cooler Shipped:								
Email Address	chris.stransky@wsp.com, marisa.swiderski@wsp.com		Return Requested: YES <u>X</u> NO <u> </u>								
Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)						
B23-12099	9/5/2023	1520	6L	Comp		X	X				
B23-12103	9/5/2023	1415	7.5L	Comp		X	X				
B23-12107	9/5/2023	1325	8L	Comp		X	X				
B23-12109	9/5/2023	0915	8L	Comp		X	X				
B23-12110	9/5/2023	1025	7L	Comp		X	X				
B23-12155	9/5/2023	1135	9L	Comp		X	X				
B23-12098	9/5/2023	1610	9L	Comp		X	X				
Samples Collected By: Marisa Swiderski			Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.			Samples Shipped via: Condition Upon Receipt:					
Relinquished/Shipped By: Signature: <u>Marisa Swiderski</u> Print Name: <u>Marisa Swiderski</u> Date/Time: <u>9/5/2023 1807</u>			Received By: Signature: <u>[Signature]</u> Print Name: <u>Jacob Fletcher</u> Date/Time: <u>9/5/23 1807</u>			Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____			Received By: Signature: _____ Print Name: _____ Date/Time: _____		

Test Codes (marine):

Mp-c: Chronic Kelp **Mb-a:** Acute Menidia/Silverside **Sp-c:** Chronic Urchin Fertilization
Hr-dv: Chronic Abalone **Mb-c:** Chronic Menidia/Silverside **Sp-dv:** Chronic Urchin Development
Aa-a: Acute Topsmelt **Ab-a:** Acute Mysid Shrimp **Ms-dv:** Chronic Mussel Development
Aa-c: Chronic Topsmelt **Ab-c:** Chronic Mysid Shrimp **Other:** Write out the test organism

Test Codes (freshwater):

Cd-a: Acute Ceriodaphnia **Sc-c:** Chronic Green Algae
Cd-c: Chronic Ceriodaphnia **Ha-a:** Acute Hyalella amphipod
Pp-a: Acute Fathead Minnow **Ha-c:** Chronic Hyalella amphipod
Pp-c: Chronic Fathead Minnow **T-22:** CA Title 22 Hazardous Waste



WSP Environmental Toxicology Lab
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117
Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To:			Project Information (if needed):			Analysis Requested (write out or use codes below)					Receipt Temp (°C)
Company	Address		Project Name	Project No.	PO Number	Eohaustorius estuarius 10-day amphipod survival test	48-hour Mytilus galloprovincialis embryo sediment-water interface test				
WSP USA Environment and Infrastructure Inc.	9177 Sky Park Ct. San Diego, CA 92123		2023 Regional Harbor Monitoring Program	2215100802.0003	N/A						
Contact/PM	Chris Stransky, Marisa Swiderski		Personal Cooler Shipped:								
Phone Number	858-775-5547; 808-772-8740		Return Requested: YES ☒ NO ☐								
Email Address	chris.stransky@wsp.com, marisa.swiderski@wsp.com										
Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)						
B23-12093	9/6/2023	1350	10L	Comp		X	X				
B23-12095	9/6/2023	1205	8L	Comp		X	X				
B23-12096	9/6/2023	1055	9L	Comp		X	X				
B23-12097	9/6/2023	0940	8L	Comp		X	X				
ms B23-12098	9/6/2023			Comp		X	X				
B23-12102	9/6/2023	0830	8L	Comp		X	X				
B23-12003	9/6/2023	1530	8L	Comp		X	X				
B23-12091	9/6/2023	1630	9L	Comp		X	X				
Samples Collected By: Marisa Swiderski			Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.			Samples Shipped via: Condition Upon Receipt:					
Relinquished/Shipped By: Signature: <u>Marisa Swiderski</u> Print Name: <u>Marisa Swiderski</u> Date/Time: <u>9/6/2023 1830</u>			Received By: Signature: <u>Hannah Kranz</u> Print Name: <u>Hannah Kranz</u> Date/Time: <u>9/6/23 1830</u>			Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____			Received By: Signature: _____ Print Name: _____ Date/Time: _____		

Test Codes (marine):

Mp-c: Chronic Kelp
Hr-dv: Chronic Abalone
Aa-a: Acute Topsmelt
Aa-c: Chronic Topsmelt
Mb-a: Acute Menidia/Silverside
Mb-c: Chronic Menidia/Silverside
Ab-a: Acute Mysid Shrimp
Ab-c: Chronic Mysid Shrimp
Sp-c: Chronic Urchin Fertilization
Sp-dv: Chronic Urchin Development
Ms-dv: Chronic Mussel Development
Other: Write out the test organism

Test Codes (freshwater):

Cd-a: Acute Ceriodaphnia
Cd-c: Chronic Ceriodaphnia
Pp-a: Acute Fathead Minnow
Pp-c: Chronic Fathead Minnow
Sc-c: Chronic Green Algae
Ha-a: Acute Hyalella amphipod
Ha-c: Chronic Hyalella amphipod
T-22: CA Title 22 Hazardous Waste

[illegible]

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

Client: WSP
Project Name: RHMP 2023
Test ID Numbers: 23-09-085 to -104
Test Type/Organism: 10-d Euk^{16S}/Mg-SWI

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
2 B23-12089	23-5090	9/17/23 1055	9/17/23 1840	12L	2.2	brown grey, fine shell wash	33.2	7.66
B23-12090	23-5091	0935		8L	3.2	extreme shell wash, brown grey	31.2	7.64
B23-12004	23-5092	1225		10L	8.8	brown, organic debris, slight odor	32.8	7.63
B23-12045	23-5093	1605		11L	9.3	black/grey, silt	33.3	7.59
B23-12046	23-5094	1435		10L	8.2	brown, fine, no odor	33.2	7.87

NH₃ mg/L
3.172
2.074
1.464
2.074
0.04

Samples checked-in by: <u>ALB</u> Samples shipped via: <u>WSP courier</u> Control sediment used: Samples seived by: <u>RV/AG</u> Date: <u>9/8/23</u> Screen Size: <u>1mm</u>	<u>Additional Analysis:</u>
	Porewater:
	Ammonia:
	Other:

Test Organism	Supplier	Receipt Date	Condition	Initials
<u>E. ESTUARIVUS</u>	<u>NWA</u>	<u>9/17/23</u>	<u>good</u>	<u>JF</u>
<u>M. gal</u>	<u>NWCI Mission Bay</u>	<u>9/19-9/20/23</u>	<u>good</u>	<u>JF</u>

Additional Comments: Detection limit on NH₃: 0.04

Initial QC: JF 12/15/23
Final Review: ALB 12/27/23

Sample Check-In: Sediments

WSP Environmental Laboratory
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117

Client: RHMP : WSP

Project Name: ↓

Test ID Numbers: 23-09-078+0-104

Test Type/Organism: Edn, mg

Porewater Analysis:

Sample ID	Sample Number	Collection Date/Time	Receipt Date/Time	Total Volume	Receipt Temp.	Sample Description	Salinity (ppt)	pH (units)
B23-12006	23-S095	9/8/23 1425	9/8/23 1425	10L	15.7	(B)	33.4	7.62
B23-12007	23-S096		1805					
B23-12007	23-S097	1230	1805	10L	10.4	thick clay shell fragments	32.9	7.62
B23-12008	23-S098	1115	1805	10L	14.0	black/brown clay-life	33.4	7.55
B23-12151	23-S099	1005	1805	10L	14.0	brown/grey clay no shell	33.8	7.75
B23-12152	23-S100	0850	1805	9L	13.0	blk brown major shell frags	33.3	7.81

NH3 mg/L

2.318

AK

1.464

2.806

2.806

1.586

DI:0

SPike: 9.76

Samples checked-in by: RN

Samples shipped via: hand

Control sediment used: ② Sieved by WSP personnel

Samples seived by: ② Date: ② Screen Size: 1mm

Additional Analysis:

Porewater:

Ammonia:

Other:

Test Organism	Supplier	Receipt Date	Condition	Initials
Estuarious	NWA	9/17/23	good	JF
M. gallo	Niwe/ Mission Bay	9/19-9/20/23	good	JF

Additional Comments: (B) Not Recorded

Initial QC: JF 12/18/23

Final Review: AG 12/27/23



WSP Environmental Toxicology Lab
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117
Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To:			Project Information (if needed):			Analysis Requested (write out or use codes below)					Receipt Temp (°C)
Company	WSP USA Environment and Infrastructure Inc.		Project Name	2023 Regional Harbor Monitoring Program		Eohaustorius estuarius 10-day amphipod survival test	48-hour Mytilus galloprovincialis embryo sediment-water interface test				
Address	9177 Sky Park Ct. San Diego, CA 92123		Project No.	2215100802.0003							
Contact/PM	Chris Stransky, Marisa Swiderski		PO Number	N/A							
Phone Number	858-775-5547; 808-772-8740		Personal Cooler Shipped:								
Email Address	chris.stransky@wsp.com, marisa.swiderski@wsp.com		Return Requested: YES ☒ NO ☐								
Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)						
B23-12089	9/7/2023	1055	12L	Comp		X	X				2.2
B23-12090	9/7/2023	0935	8L	Comp		X	X				3.2
B23-12004	9/7/2023	1225	10L	Comp		X	X				8.8
B23-12045	9/7/2023	1605	11L	Comp		X	X				9.3
B23-12046	9/7/2023	1435	10L	Comp		X	X				8.2
Samples Collected By: Marisa Swiderski		Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.				Samples Shipped via: Condition Upon Receipt:					
Relinquished/Shipped By: Signature: <u>Marisa Swiderski</u> Print Name: <u>Marisa Swiderski</u> Date/Time: <u>9/7/2023 1840</u>		Received By: Signature: <u>Alexi Gabriel</u> Print Name: <u>Alexi Gabriel</u> Date/Time: <u>9/7/23 1840</u>		Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____		Received By: Signature: _____ Print Name: _____ Date/Time: _____					

Test Codes (marine):

Mp-c: Chronic Kelp
Hr-dv: Chronic Abalone
Aa-a: Acute Topsmelt
Aa-c: Chronic Topsmelt
Mb-a: Acute Menidia/Silverside
Mb-c: Chronic Menidia/Silverside
Ab-a: Acute Mysid Shrimp
Ab-c: Chronic Mysid Shrimp
Sp-c: Chronic Urchin Fertilization
Sp-dv: Chronic Urchin Development
Ms-dv: Chronic Mussel Development
Other: Write out the test organism

Test Codes (freshwater):

Cd-a: Acute Ceriodaphnia
Cd-c: Chronic Ceriodaphnia
Pp-a: Acute Fathead Minnow
Pp-c: Chronic Fathead Minnow
Sc-c: Chronic Green Algae
Ha-a: Acute Hyalella amphipod
Ha-c: Chronic Hyalella amphipod
T-22: CA Title 22 Hazardous Waste



WSP Environmental Toxicology Lab
4905 Morena Blvd, Ste. 1304
San Diego, CA 92117
Phone: (858) 299-5368

Chain of Custody Form

Page 1 of 1

Client/Send Report To: Company <u>WSP USA Environment and Infrastructure Inc.</u> Address <u>9177 Sky Park Ct.</u> <u>San Diego, CA 92123</u> Contact/PM <u>Chris Stransky, Marisa Swiderski</u> Phone Number <u>858-775-5547; 808-772-8740</u> Email Address <u>chris.stransky@wsp.com, marisa.swiderski@wsp.com</u>			Project Information (if needed): Project Name <u>2023 Regional Harbor Monitoring Program</u> Project No. <u>2215100802.0003</u> PO Number <u>N/A</u> Personal Cooler Shipped: Return Requested: YES <u>X</u> NO <u> </u>			Analysis Requested (write out or use codes below)					Receipt Temp (°C)
						<i>Eohaustorius estuarius</i> 10-day amphipod survival test	48-hour <i>Mytilus galloprovincialis</i> embryo sediment-water interface test				
Sample ID	Collection Date	Collection Time	Sample Volume	Sample Type: Grab/Comp.	Sample Number (for lab use)						
B23-12006	9/8/2023	1425	10L	Comp		X	X			15.7	
B23-12007	9/8/2023	1230	10L	Comp		X	X			10.4	
B23-12008	9/8/2023	1115	10L	Comp		X	X			14.0	
B23-12151	9/8/2023	1005	10L	Comp		X	X			14.0	
B23-12152	9/8/2023	0850	9L	Comp		X	X			13.0	
Samples Collected By: Marisa Swiderski		Please conduct tests in accordance with the RHMP Work Plan/QAPP and the Bight '23 Toxicology Laboratory Manual.				Samples Shipped via: Condition Upon Receipt:					
Relinquished/Shipped By: Signature: <u>Marisa Swiderski</u> Print Name: <u>Marisa Swiderski</u> Date/Time: <u>9/8/2023 1805</u>		Received By: Signature: <u>Riley von Richter</u> Print Name: <u>Riley von Richter</u> Date/Time: <u>9/8/2023 1805</u>		Relinquished By: Signature: _____ Print Name: _____ Date/Time: _____		Received By: Signature: _____ Print Name: _____ Date/Time: _____					

Test Codes (marine):

Mp-c: Chronic Kelp
Hr-dv: Chronic Abalone
Aa-a: Acute Topsmelt
Aa-c: Chronic Topsmelt
Mb-a: Acute Menidia/Silverside
Mb-c: Chronic Menidia/Silverside
Ab-a: Acute Mysid Shrimp
Ab-c: Chronic Mysid Shrimp
Sp-c: Chronic Urchin Fertilization
Sp-dv: Chronic Urchin Development
Ms-dv: Chronic Mussel Development
Other: Write out the test organism

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Pp-c: Chronic Fathead Minnow
Sc-c: Chronic Green Algae
Ha-a: Acute Hyalella amphipod
Ha-c: Chronic Hyalella amphipod
T-22: CA Title 22 Hazardous Waste

Unionized Ammonia Calculation for Pressure of 1 atm															
Input 'Shaded' data															

APPENDIX B

Statistical Analyses and Raw Data Packages for *Eohaustorius*

Amphipod Batch #1

8/15/23

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP 2023 #1 08/15/2023

Species *Eohaustorius estuarius*

Test No. 23-08-030 to 035

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
Lab Control	32	20	20	100	99.0	NA
	34	20	19	95		
	38	20	20	100		
	15	20	20	100		
	30	20	20	100		
B23-12000	7	20	19	95	96.0	97.0
	23	20	19	95		
	10	20	20	100		
	12	20	20	100		
	2	20	18	90		
B23-12001	36	20	18	90	96.0	97.0
	4	20	19	95		
	9	20	20	100		
	3	20	19	95		
	40	20	20	100		
B23-12002	21	20	15	75	89.0	89.9
	29	20	18	90		
	26	20	17	85		
	11	20	20	100		
	31	20	19	95		
B23-12148	33	20	18	90	81.0	81.8
	18	20	16	80		
	35	20	17	85		
	14	20	15	75		
	17	20	15	75		
B23-12005	8	20	20	100	93.0	93.9
	28	20	17	85		
	22	20	19	95		
	19	20	19	95		
	16	20	18	90		
B23-12150	27	20	20	100	97.0	98.0
	6	20	19	95		
	5	20	20	100		
	20	20	19	95		
	1	20	19	95		

Comments: Values in **bold** indicate a statistically significant difference from the Lab Control.

Data Entered: HK 11/20/2023

Data QC'd: TD (12/17/23)

Final Review: JS

Survival Counts for 10 day Amphipod Test

Client: WSP
 Project ID: RHMP 2023 #1 8/15/2023
 Species *Eohaustorius estuarius*
 Test No. 23-08-030 to 035

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
Grain Size Control	25	20	20	100	98.0	99.0
	24	20	18	90		
	13	20	20	100		
	37	20	20	100		
	39	20	20	100		

Comments: Values in **bold** indicate a statistically significant difference from the Lab Control.

Data Entered: HK 11/20/2023
 Data QC'd: TD (12/21/23)

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#1 8.15.23
2		
3	Column B	B23-12000
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1031
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.414$, $df=6.113$
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column B	96.00
17	Difference between means ($B - A$) $\pm$ SEM	-3.000 ± 2.121
18	95% confidence interval	-8.167 to 2.167
19	R squared (eta squared)	0.2465
20		
21	F test to compare variances	
22	F, DFn, Dfd	3.500, 4, 4
23	P value	0.2524
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#1 8.15.23
2		
3	Column C	B23-12001
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1031
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.414$, $df=6.113$
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column C	96.00
17	Difference between means ($C - A$) $\pm$ SEM	-3.000 ± 2.121
18	95% confidence interval	-8.167 to 2.167
19	R squared (eta squared)	0.2465
20		
21	F test to compare variances	
22	F, DFn, Dfd	3.500, 4, 4
23	P value	0.2524
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Final Review: 35

Welch's t test Tabular results		
1	Table Analyzed	RHMP#1 8.15.23
2		
3	Column D	B23-12002
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0399
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.265, df=4.431
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column D	89.00
17	Difference between means (D - A) $\pm$ SEM	-10.00 $\pm$ 4.416
18	95% confidence interval	-21.80 to 1.804
19	R squared (eta squared)	0.5365
20		
21	F test to compare variances	
22	F, DFn, Dfd	18.50, 4, 4
23	P value	0.0152
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column D	5

Final Review 5?

Welch's t test Tabular results		
1	Table Analyzed	RHMP#1 8.15.23
2		
3	Column E	B23-12148
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0011
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=5.840, df=4.928
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column E	81.00
17	Difference between means (E - A) $\pm$ SEM	-18.00 $\pm$ 3.082
18	95% confidence interval	-25.96 to -10.04
19	R squared (eta squared)	0.8737
20		
21	F test to compare variances	
22	F, DFn, Dfd	8.500, 4, 4
23	P value	0.0618
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP#1 8.15.23
2		
3	Column F	B23-12005
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0389
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.191$, $df=5.202$
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column F	93.00
17	Difference between means ($F - A$) $\pm$ SEM	-6.000 ± 2.739
18	95% confidence interval	-12.96 to 0.9583
19	R squared (eta squared)	0.4799
20		
21	F test to compare variances	
22	F, DFn, Dfd	6.500, 4, 4
23	P value	0.0972
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP#1 8.15.23
2		
3	Column G	B23-12150
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1214
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=1.265, df=7.692
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column G	97.00
17	Difference between means (G - A) $\pm$ SEM	-2.000 $\pm$ 1.581
18	95% confidence interval	-5.672 to 1.672
19	R squared (eta squared)	0.1722
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.500, 4, 4
23	P value	0.7040
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	Grain Size/Lab Control
2		
3	Column B	Lab Control #1
4	vs.	vs.
5	Column A	Grain Size #1
6		
7	Unpaired t test with Welch's correction	
8	P value	0.3354
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.4472$, $df=5.882$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column B	99.00
17	Difference between means ($B - A$) $\pm$ SEM	1.000 ± 2.236
18	95% confidence interval	-4.498 to 6.498
19	R squared (eta squared)	0.03288
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.000, 4, 4
23	P value	0.2080
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Fig 91 Review: 33

Survival Counts for 10day Amphipod Test

Client: WSP
Project ID: RHMP 2023 #1
Test No. 23-08-030 10-035

Test Species: *E. estuarius*
Start Date/Time: 8/15/2023 1400
End Date/Time: 8/25/2023 1000

Rand #	Survival Counts		Final-Weights (Growth)		
	Start (Day 0)	End (Day 10)	Pan Weight	Pan + Organism Weight	Final Weight (per organism)
1	20	20	19		
2	20	18			
3	20	19			
4	20	19			
5	20	20			
6	20	19	19		
7	20	19			
8	20	20			
9	20	20			
10	20	20			
11	20	20	20		
12	20	20			
13	20	20			
14	20	15			
15	20	20			
16	20	18	18		
17	20	15			
18	20	16			
19	20	19			
20	20	19			
21	20	15	15		
22	20	19			
23	20	19			
24	20	18			
25	20	19 20			
26	20	17	17		
27	20	20			
28	20	17			
29	20	18			
30	20	20			
31	20	19	19		
32	20	20			
33	20	18			
34	20	19			
35	20	17			

Tech Initials: JP AG/SP RN

Ammonia Collected: AG Test Start: AG Test End: AG

Comments:

QC Check: HK 11/10/23 Final Review: JS 4/21/25

Survival Counts for 10day Amphipod Test

Client: WSP
Project ID: RHMP 2023 #1
Test No. 23-08-030 to

Test Species: *E. estuarius*

Start Date/Time:	8/15/2023	1400
End Date/Time:	8/25/2023	1000

[illegible]

QC: RYB
Ammonia Collected: Test Start: AB Test End: AV
Comments: * one possible neonate, smaller than others
QC Check: HK 11/8/23 Final Review: JS 4/2/25

Water Quality for 10day Amphipod Test

Client: WSP

Project ID: RHMP 2023 # 1

Test No. 23-08-030 to -035

Test Species: *E. estuarius*

Start Date/Time: 8/15/2023 1400

End Date/Time: 8/25/2023 1000

Sample ID	Water Quality Measurements (Day)										QC	
	Parameter	0	1	2	3	4	5	6	7	8	9	10
Lab Control	Temp. (°C)	14.7	15.9	15.6	15.5	15.9	15.8	15.9	16.0	16.5	16.0	16.3
	Salinity (ppt)	32.0		31.9		31.8		32.6		32.3		32.5
	pH (units)	7.56		7.75		7.80		7.91		7.70		7.79
	DO (mg/L)	8.4	7.6	7.8	7.7	7.7	7.8	7.8	7.9	7.8	7.2	7.7
B23-12000	Temp. (°C)	14.6	15.5	15.6	15.4	15.6	15.7	15.7	15.7	16.5	16.0	16.0
	Salinity (ppt)	32.3		32.0		32.0		32.9		33.3		33.3
	pH (units)	7.59		7.74		7.89		7.96		7.75		7.89
	DO (mg/L)	8.0	7.8	7.7	7.9	7.8	7.9	8.0	8.0	7.9	7.8	7.7
B23-12001	Temp. (°C)	14.4	15.4	15.5	15.4	15.8	15.8	16.0	14.6	16.6	15.9	16.0
	Salinity (ppt)	32.3		32.0		32.0		32.8		32.8		33.2
	pH (units)	7.58		7.73		7.86		7.91		7.69		7.85
	DO (mg/L)	8.0	7.9	7.8	7.8	7.7	7.9	7.9	7.9	7.9	7.9	7.8
B23-12002	Temp. (°C)	14.7	15.2	15.4	15.3	15.8	15.6	15.9	14.9	16.5	15.9	15.8
	Salinity (ppt)	32.2		31.8		31.8		32.3		32.4		32.9
	pH (units)	7.59		7.73		7.89		7.92		7.71		7.88
	DO (mg/L)	8.1	8.0	7.8	7.8	7.7	7.9	7.9	8.1	7.9	8.0	7.9
B23-12148	Temp. (°C)	14.6	14.9	15.3	15.2	15.9	15.6	15.7	15.0	16.4	14.8	15.7
	Salinity (ppt)	32.3		31.9		31.8		32.5		32.5		33.3
	pH (units)	7.59		7.72		7.88		7.93		7.71		7.87
	DO (mg/L)	8.1	8.0	7.8	7.8	7.7	7.9	7.9	8.1	8.0	8.0	7.9
B23-12005	Temp. (°C)	14.5		15.1	14.9	15.5	15.3	15.3	15.0	16.2	14.9	15.4
	Salinity (ppt)	32.2		32.0		32.0		33.2		33.1		33.9
	pH (units)	7.62		7.76		7.93		8.01		7.82		8.00
	DO (mg/L)	8.1	8.0	7.8	7.9	7.8	7.9	8.2	8.0	8.0	8.1	8.0
B23-12150	Temp. (°C)	14.5	14.7	15.6	15.7	15.9	15.8	16.0	16.5	16.1	15.4	15.7
	Salinity (ppt)	32.1		31.7		31.8		32.4		32.0		32.1
	pH (units)	7.62		7.71		7.92		7.98		7.84		8.07
	DO (mg/L)	8.1	8.0	7.7	7.9	7.8	7.9	8.0	8.0	8.0	8.1	7.9
Tech Initials (Initial):		HK	HK	KYB	HK	JS	HK	HK	JS	AB	KYB	RN

Date Animals Received: 8/19/23

Age or Size of Animals: 2-3 days 3-5mm

Comments:

QC Check: HK 11/15/23

Final Review: JS 4/2/25

Water Quality for 10day Amphipod Test

Client: WSP

Project ID: RHMP 2023 # 1

Test No. 23-08-030 to -035

Test Species: *E. estuarius*

Start Date/Time: 8/15/2023 1400

End Date/Time: 8/25/2023 1000

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
Grain Size Control	Temp. (°C)	14.7	15.3	15.6	15.8	15.6	15.9	16.0	15.8	16.0	15.1	15.4
	Salinity (ppt)	32.3		31.8		31.8		32.4		32.0		32.1
	pH (units)	7.60		7.69		7.82		7.91		7.70		7.90
	DO (mg/L)	8.2	8.0	7.9	7.9	7.9	7.6	8.0	8.1	8.0	8.2	8.0
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											

Tech Initials (Initial): HK HK KYB HK/KYB JF HK HK JP AG KYB RV

Date Animals Received: 8/19/23

Age or Size of Animals: 2-3mm 3-5mm

Comments:

QC Check: HK 11/8/23

Final Review: JS 4/2/25

WSP
RHMP #1 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control	32 34 38 15 30
B23-12000	7 23 10 12 2
B23-12001	36 4 9 3 40
B23-12002	21 29 26 11 31
B23-12148	33 18 35 14 17
B23-12005	8 28 22 19 16

QC Check - Amphipod: _____

WSP
RHMP #1 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12150	27
	6
	5
	20
	1
Grain Size Control	25
	24
	13
	37
	39

QC Check - Amphipod: _____

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 #1

Start Date: 8/15/2023 1400

Test No.: 23-08-030 to 035

End Date: 8/25/2023 1000

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.5

$$(x1.22)$$
[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check:

Final Review: JS

Ammonia Subsample Analysis - Porewater

Client: WSP
Project ID: RHMP 2023 #1
Test No.: 23-08-030 to -035

Test Species: *E. estuarius*
 Start Date: 8/15/2023 1400
 End Date: 8/25/2002 1000

DI Blank: $\frac{0.0}{6.0 \text{ 8124123}}$

10 mg/L Ammonia Stock: 9.2
(x 1.22) 9.0 8124123

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check:

Final Review:

B23_Eoh Site Unionized Complete

[illegible]

B23_Eoh Site Unionized Complete

								Unionized Ammonia Calculation for Pressure of 1 atm										
								Input 'Shaded' data										
									I	pK								
									1	9.26								
									2	9.27								
									3	9.28								
									4	9.29								
									5	9.30								
									6	9.32								
									7	9.33								
									8	9.34								
Eoh RHMP #1 Porewater								Total										
	Log Number	vial	Day	Dilution				Ammonia (mg/L)	Temp (C)	Salinity (ppt)	pH	Temp (K)	I	I Rounded	pK	Unionized Ammonia	D.O. (mg/L)	
	B23-12000	7	0	-88				5.98	14.6	33.5	7.34	287.76	7.41	1	9.26	0.033		
	B23-12001	8	0	-88				4.76	14.4	33.5	7.31	287.56	7.41	1	9.26	0.024		
	B23-12002	9	0	-88				5.37	14.7	32.6	7.35	287.86	7.22	1	9.26	0.031		
	B23-12148	10	0	-88				5.61	14.6	32.8	7.37	287.76	7.26	1	9.26	0.033		
	B23-12005	11	0	-88				19.52	14.5	32.9	7.50	287.66	7.28	1	9.26	0.156		
	B23-12150	12	0	-88				9.76	14.5	32.2	7.47	287.66	7.13	1	9.26	0.073		

Amphipod Batch #2

8/22/23

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP #2 8.22.23

Species *Eohaustorius estuarius*

Test No. 23-08-042 to 049

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
Lab Control	44	20	20	100	99.0	NA
	14	20	19	95		
	11	20	20	100		
	5	20	20	100		
	18	20	20	100		
B23-12059	35	20	20	100	97.0	98.0
	34	20	19	95		
	8	20	20	100		
	41	20	19	95		
	50	20	19	95		
B23-12060	31	20	16	80	86.0	86.9
	48	20	18	90		
	43	20	17	85		
	32	20	18	90		
	40	20	17	85		
B23-12061	36	20	17	85	90.0	90.9
	37	20	15	75		
	46	20	19	95		
	23	20	19	95		
	47	20	20	100		
B23-12062	17	20	16	80	91.0	91.9
	27	20	19	95		
	3	20	19	95		
	6	20	17	85		
	42	20	20	100		
B23-12063	26	20	20	100	95.0	96.0
	19	20	19	95		
	39	20	19	95		
	10	20	18	90		
	33	20	19	95		
B23-12064	9	20	20	100	96.0	97.0
	45	20	20	100		
	1	20	18	90		
	49	20	18	90		
	12	20	20	100		

Comments: **Bold** indicates statistically significant difference.

QC Check: TD (12/17/23)

Final Review: JS 4/15/25

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP #2 8.22.23

Species *Eohaustorius estuarius*

Test No. 23-08-042 to 049

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
B23-12065	7	20	19	95	95.0	96.0
	28	20	18	90		
	16	20	19	95		
	21	20	20	100		
	38	20	19	95		
B23-12066	2	20	17	85	96.0	97.0
	24	20	20	100		
	15	20	20	100		
	13	20	20	100		
	29	20	19	95		
Grain Size	25	20	19	95	99.0	100.0
	22	20	20	100		
	4	20	20	100		
	30	20	20	100		
	20	20	20	100		

Comments: **Bold** indicates statistically significant difference.

QC Check: TD (12/17/23)

Final Review: JS 4/15/25

Welch's t test Tabular results		
1	Table Analyzed	RHMP#2 8.22.23
2		
3	Column B	B23-12059
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1214
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.265$, $df=7.692$
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column B	97.00
17	Difference between means ($B - A$) $\pm$ SEM	-2.000 ± 1.581
18	95% confidence interval	-5.672 to 1.672
19	R squared (eta squared)	0.1722
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.500, 4, 4
23	P value	0.7040
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Review JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#2 8.22.23
2		
3	Column C	B23-12060
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0004
9	P value summary	***
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=6.128$, $df=6.113$
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column C	86.00
17	Difference between means ($C - A$) $\pm$ SEM	-13.00 ± 2.121
18	95% confidence interval	-18.17 to -7.833
19	R squared (eta squared)	0.8600
20		
21	F test to compare variances	
22	F, DFn, Dfd	3.500, 4, 4
23	P value	0.2524
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#2 8.22.23
2		
3	Column D	B23-12061
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0573
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.964$, $df=4.399$
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column D	90.00
17	Difference between means (D - A) $\pm$ SEM	-9.000 ± 4.583
18	95% confidence interval	-21.28 to 3.281
19	R squared (eta squared)	0.4672
20		
21	F test to compare variances	
22	F, DFn, Dfd	20.00, 4, 4
23	P value	0.0132
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column D	5

Final Review JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#2 8.22.23
2		
3	Column E	B23-12062
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0473
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.101$, $df=4.589$
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column E	91.00
17	Difference between means ($E - A$) $\pm$ SEM	-8.000 ± 3.808
18	95% confidence interval	-18.06 to 2.058
19	R squared (eta squared)	0.4902
20		
21	F test to compare variances	
22	F, DF _n , DF _d	13.50, 4, 4
23	P value	0.0272
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

Final Review: 51

Welch's t test Tabular results		
1	Table Analyzed	RHMP#2 8.22.23
2		
3	Column F	B23-12063
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0356
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.138$, $df=6.759$
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column F	95.00
17	Difference between means ($F - A$) $\pm$ SEM	-4.000 ± 1.871
18	95% confidence interval	-8.456 to 0.4560
19	R squared (eta squared)	0.4035
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.500, 4, 4
23	P value	0.3965
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Final Review JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#2 8.22.23
2		
3	Column G	B23-12064
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1528
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.134$, $df=5.297$
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column G	96.00
17	Difference between means ($G - A$) $\pm$ SEM	-3.000 ± 2.646
18	95% confidence interval	-9.688 to 3.688
19	R squared (eta squared)	0.1953
20		
21	F test to compare variances	
22	F, DFn, Dfd	6.000, 4, 4
23	P value	0.1108
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review: 39

Welch's t test Tabular results		
1	Table Analyzed	RHMP#2 8.22.23
2		
3	Column H	B23-12065
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0356
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.138$, $df=6.759$
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column H	95.00
17	Difference between means ($H - A$) $\pm$ SEM	-4.000 ± 1.871
18	95% confidence interval	-8.456 to 0.4560
19	R squared (eta squared)	0.4035
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.500, 4, 4
23	P value	0.3965
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column H	5

Final Review. 59

Welch's t test Tabular results		
1	Table Analyzed	RHMP#2 8.22.23
2		
3	Column I	B23-12066
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1879
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.9733$, $df=4.928$
13		
14	How big is the difference?	
15	Mean of column A	99.00
16	Mean of column I	96.00
17	Difference between means (I - A) $\pm$ SEM	-3.000 ± 3.082
18	95% confidence interval	-10.96 to 4.958
19	R squared (eta squared)	0.1612
20		
21	F test to compare variances	
22	F, DFn, Dfd	8.500, 4, 4
23	P value	0.0618
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column I	5

T-1441 Review JS

Welch's t test Tabular results		
1	Table Analyzed	Grain Size/Lab Control
2		
3	Column D	Grain Size #2
4	vs.	vs.
5	Column C	Lab Control #2
6		
7	Unpaired t test with Welch's correction	
8	P value	0.5000
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.000$, $df=8.000$
13		
14	How big is the difference?	
15	Mean of column C	99.00
16	Mean of column D	99.00
17	Difference between means ($D - C$) $\pm$ SEM	0.000 ± 1.414
18	95% confidence interval	-3.261 to 3.261
19	R squared (eta squared)	0.000
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.000, 4, 4
23	P value	
24	P value summary	
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column C	5
29	Sample size, column D	5

Final Review JS

Survival Counts for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 #2

Start Date/Time: 8/22/2023

1230

Test No. Reference WSP Test Log

End Date/Time: 9/1/2023

1045

Rand #	Survival Counts		Survival Counts
	Start (Day 0)	End (Day 10)	QC
1	20	18	18
2	20	17	
3	20	19	
4	20	20	
5	20	20	
6	20	17	17
7	20	19	
8	20	20	
9	20	20	
10	20	18	
11	20	20	
12	20	20	
13	20	20	
14	20	19	
15	20	20	
16	20	19	
17	20	16	16
18	20	20	
19	20	19	
20	20	20	
21	20	20	20
22	20	20	
23	20	19	
24	20	20	
25	20	19	
26	20	20	20
27	20	19	
28	20	18	
29	20	19	
30	20	20	
31	20	16	16
32	20	18	
33	20	19	
34	20	19	
35	20	20	

Tech Initials:

RV JP

ALB

HK

Ammonia Collected: Test Start:

TF

Test End:

ALB

Comments:

QC Check: HK 11/8/23

Final Review:

JS

WSP
Amec Foster Wheeler Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

Survival Counts for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 #2

Start Date/Time: 8/22/2023 1230

Test No. Reference WSP-Test Log

End Date/Time: 9/1/2023 1045

[illegible]

Tech Initials:	TF	KYP	HK
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Ammonia Collected: _____ Test Start: TF _____ Test End: AG _____

Comments: B23-12060 surr. = 19/20, B23-12061 = 18/20, B23-12060 surr. = 18/20

QC Check: HK 1V8123 Final Review: JS

Ames Foster Wheeler Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117
WSP

Water Quality for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 # 2

Start Date/Time: 8/22/2023 1230

Test No. 23-08-046 to 049
Reference WSP TEST KEY

End Date/Time: 9/1/2022 1045

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
Lab Control	Temp. (°C)	15.9	15.7	15.1	15.3	15.1	14.6	15.7	15.5	15.6	15.3	15.7
	Salinity (ppt)	31.6		32.0		31.9		31.8	31.7	32.0		32.0
	pH (units)	7.55		7.78		7.68		7.76	7.7	7.67		7.68
	DO (mg/L)	7.7	8.1	7.8	8.2	7.8	8.1	7.7	7.79	7.7	7.8	8.3
B23-12059	Temp. (°C)	16.0	15.7	14.9	14.8	14.6	14.2	15.5	15.3	15.4	15.2	15.7
	Salinity (ppt)	31.7		32.0		32.1		32.1	32.3			32.3
	pH (units)	7.74		7.77		7.74		7.82		7.69		7.73
	DO (mg/L)	8.0	8.1	8.0	8.1	7.9	8.1	7.8	7.8	7.8	7.9	8.4
B23-12060	Temp. (°C)	16.0	15.7	14.7	15.0	14.7	14.1	15.6	15.3	15.3	15.2	15.6
	Salinity (ppt)	31.8		32.2		32.1		31.9		32.5		32.5
	pH (units)	7.69		7.77		7.77		7.87		7.74		7.80
	DO (mg/L)	7.7	8.1	8.1	8.1	7.7	8.0	7.8	7.8	7.7	7.9	8.4
B23-12061	Temp. (°C)	15.9	15.6	14.6	15.0	14.5	14.0	15.7	15.3	15.3	15.3	15.7
	Salinity (ppt)	31.9		32.2		32.1		32.1	31.8			32.4
	pH (units)	7.71		7.75		7.74		7.82		7.71		7.71
	DO (mg/L)	7.9	8.1	8.2	8.1	7.8	8.0	8.0	8.0	8.0	7.9	8.1
B23-12062	Temp. (°C)	15.9	15.6	14.7	15.2	14.5	14.0	15.7	15.4	15.4	15.2	15.7
	Salinity (ppt)	31.7		32.0		31.9		31.8	32.1			32.2
	pH (units)	7.73		7.75		7.76		7.83		7.70		7.73
	DO (mg/L)	7.9	8.1	8.3	8.1	7.8	8.1	8.0	8.0	8.0	8.0	8.2
B23-12063	Temp. (°C)	15.9	15.3	14.6	14.8	14.4	14.1	15.4	15.2	15.2	15.6	15.8
	Salinity (ppt)	31.9		32.0		31.9		31.9	32.2			32.4
	pH (units)	7.75		7.77		7.80		7.87	7.73			7.76
	DO (mg/L)	7.9	8.1	8.3	8.1	7.9	8.0	8.0	8.0	8.0	7.8	8.2
B23-12064	Temp. (°C)	15.9	15.1	14.5	14.4	14.4	14.0	15.1	14.8	14.8	15.0	15.7
	Salinity (ppt)	31.7		31.9		31.8		31.8	32.1			32.2
	pH (units)	7.74		7.76		7.72		7.84	7.73			7.76
	DO (mg/L)	8.0	8.2	8.3	8.1	7.8	8.1	8.1	8.1	8.1	7.9	8.2
Tech Initials (Initial):		JF	AG	KYB	RV	RV	SC	JF	RV	KYB	KYB	KYB

Date Animals Received: 8/17/23

Age or Size of Animals: 2-3 mm

Comments:

QC Check: HK 11/8/23

Final Review: JS

Water Quality for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 # 2

Start Date/Time: 8/22/2023 1230

Test No. Reference WSP Test Log

End Date/Time: 9/1/2023 1045

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
B23-12065	Temp. (°C)	15.2	14.8	14.2	14.3	14.4	14.1	14.2	14.0	14.6	14.5	15.7
	Salinity (ppt)	32.0		32.2		32.0		32.0		32.3		32.4
	pH (units)	7.72		7.74		7.75		7.81		7.82		7.72
	DO (mg/L)	8.0	8.2	8.3	8.1	7.9	8.1	8.0	8.4	8.2	8.0	8.2
B23-12066	Temp. (°C)	15.6	14.7	14.1	14.3	14.2	14.0	14.6	14.0	14.6	14.4	15.6
	Salinity (ppt)	31.9		32.1		31.8		31.9		32.2		32.3
	pH (units)	7.72		7.75		7.77		7.85		7.71		7.75
	DO (mg/L)	8.1	8.2	8.4	8.1	7.9	8.1	8.2	8.4	8.2	8.1	8.2
Grain Size Control	Temp. (°C)	15.4	14.7	14.1	14.3	14.2	14.0	14.5	14.0	14.5	14.3	15.7
	Salinity (ppt)	31.9		32.1		31.9		31.9		32.2		32.2
	pH (units)	7.71		7.74		7.75		7.81		7.69		7.71
	DO (mg/L)	8.0	8.2	8.4	8.2	7.8.0	8.2	8.1	8.3	8.2	8.1	8.1
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											

Tech Initials (Initial): JF AB KYB RV RV SC JF RV KYB KYB KYB

Date Animals Received: 8/17/23

Age or Size of Animals: 2-3 mm

Comments:

QC Check: HK 11/8/23

Final Review: JS

WSP
RHMP #2 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control	44
	14
	11
	5
	18
B23-12059	35
	34
	8
	41
	50
B23-12060	31
	48
	43
	32
	40
B23-12061	36
	37
	46
	23
	47
B23-12062	17
	27
	3
	6
	42
B23-12063	26
	19
	39
	10
	33

QC Check - Amphipod: AB

WSP
RHMP #2 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12064	9 45 1 49 12
B23-12065	7 28 16 21 38
B23-12066	2 24 15 13 29
Grain Size Control	25 22 4 30 20

QC Check - Amphipod: AG

(overlying water)

Project ID: RHMP # 2

Test No.: Reference WSP Test Log

Start Date: 8/22/2023 1230

End Date: 9/1/2023 1045

DI Blank:

10 mg/L Ammonia Stock:

measuring range ≤ 2
QC Check: HK 11/8/23

Final Review:

卽

Ammonia Subsample Analysis - Porewater

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP #2

Start Date: 8/22/2023 1230

Test No.: Reference WSP Test Log

End Date: 9/1/2023 1045

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.0
(x 1.22)

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check: HV 1118123

Final Review: JS

WSP
WSP-Enterprise

WSP Environmental Laboratory, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

Unionized Ammonia Calculation for Pressure of 1 atm															
Input 'Shaded' data															

Unionized Ammonia Calculation for Pressure of 1 atm														
Input 'Shaded' data														
I pK														
1 9.26														
2 9.27														
3 9.28														
4 9.29														
5 9.30														
6 9.32														
7 9.33														
8 9.34														
Eoh RHMP #2 Porewater	Total Ammonia (mg/L) Temp (C) Salinity (ppt) pH Temp (K) I I Rounded pK Unionized Ammonia D.O. (mg/L)													
	Log Number	vial	Day	Dilution										
	B23-12059	35	0	-88	4.1	16.0	31.5	7.60	289.16	6.98	1	9.26	0.046	
	B23-12060	36	0	-88	2.0	16.0	32.2	7.27	289.16	7.13	1	9.26	0.011	
	B23-12061	37	0	-88	3.9	15.9	32.4	7.30	289.06	7.17	1	9.26	0.022	
	B23-12062	38	0	-88	2.8	15.9	32.1	7.45	289.06	7.11	1	9.26	0.022	
	B23-12063	39	0	-88	6.6	15.9	32.5	7.44	289.06	7.20	1	9.26	0.051	
	B23-12064	40	0	-88	3.8	15.9	32.7	7.47	289.06	7.24	1	9.26	0.031	
	B23-12065	41	0	-88	1.2	15.2	32.6	7.43	288.36	7.22	1	9.26	0.009	
	B23-12066	42	0	-88	3.2	15.6	33.0	7.67	288.76	7.30	1	9.26	0.041	
Grain Size					3.90	15.4	33.1	7.32	288.56	7.32	1	9.26	0.022	
Lab Control					0.50	15.9	32.1	7.46	289.06	7.11	1	9.26	0.004	
Data Check: NJ/HK														
QC: RV														

Amphipod Batch #3

8/29/23

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP 2023 #3 08/29/2023

Species *Eohaustorius estuarius*

Test No. 23-08-052 to -060

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
Lab Control	1	20	18	90	97.0	NA
	46	20	20	100		
	43	20	20	100		
	54	20	20	100		
	34	20	19	95		
B23-12022	40	20	17	85	93.0	95.9
	30	20	19	95		
	38	20	18	90		
	4	20	19	95		
	25	20	20	100		
B23-12023	20	20	18	90	89.0	91.8
	53	20	19	95		
	41	20	15	75		
	16	20	19	95		
	12	20	18	90		
B23-12024	51	20	16	80	85.0	87.6
	2	20	17	85		
	9	20	18	90		
	17	20	16	80		
	42	20	18	90		
B23-12025	44	20	18	90	86.0	88.7
	23	20	18	90		
	13	20	18	90		
	48	20	17	85		
	27	20	15	75		
B23-12026	10	20	16	80	82.0	84.5
	18	20	17	85		
	6	20	18	90		
	22	20	17	85		
	45	20	14	70		
B23-12055	55	20	16	80	90.0	92.8
	5	20	15	75		
	8	20	20	100		
	24	20	20	100		
	39	20	19	95		

Comments: **Bold** indicates statistically significant difference.

Data Entered: HK 12/5/2023

Data QC'd: TD (12/17/2023)

WSP Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP 2023 #3 08/29/2023

Species *Eohaustorius estuarius*

Test No. 23-08-052 to -060

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
B23-12056	14	20	19	95	91.0	93.8
	47	20	19	95		
	21	20	16	80		
	50	20	19	95		
	15	20	18	90		
B23-12057	28	20	19	95	90.0	92.8
	19	20	18	90		
	26	20	19	95		
	7	20	17	85		
	33	20	17	85		
B23-12058	37	20	20	100	92.0	94.8
	3	20	17	85		
	36	20	17	85		
	49	20	19	95		
	29	20	19	95		
Grain Size Control	35	20	19	95	94.0	96.9
	52	20	20	100		
	32	20	17	85		
	31	20	18	90		
	11	20	20	100		

Comments: **Bold** indicates statistically significant difference.

Data Entered HK 12/5/23

Data QC'd TD (12/17/2023)

Final Review: JS 4/15/25

Welch's t test Tabular results		
1	Table Analyzed	RHMP#3 8.29.23
2		
3	Column B	B23-12022
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1270
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.234$, $df=7.571$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column B	93.00
17	Difference between means ($B - A$) $\pm$ SEM	-4.000 ± 3.240
18	95% confidence interval	-11.55 to 3.547
19	R squared (eta squared)	0.1676
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.625, 4, 4
23	P value	0.6496
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Review JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#3 8.29.23
2		
3	Column C	B23-12023
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0515
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.912$, $df=6.179$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column C	89.00
17	Difference between means ($C - A$) $\pm$ SEM	-8.000 ± 4.183
18	95% confidence interval	-18.16 to 2.165
19	R squared (eta squared)	0.3718
20		
21	F test to compare variances	
22	F, DFn, Dfd	3.375, 4, 4
23	P value	0.2657
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Final Review: JS

Welch's t test Tabular results	
1	Table Analyzed
2	
3	Column D
4	vs.
5	Column A
6	
7	Unpaired t test with Welch's correction
8	P value
9	P value summary
10	Significantly different ($P < 0.05$)?
11	One- or two-tailed P value?
12	Welch-corrected t, df
13	
14	How big is the difference?
15	Mean of column A
16	Mean of column D
17	Difference between means (D - A) $\pm$ SEM
18	95% confidence interval
19	R squared (eta squared)
20	
21	F test to compare variances
22	F, DFn, Dfd
23	P value
24	P value summary
25	Significantly different ($P < 0.05$)?
26	
27	Data analyzed
28	Sample size, column A
29	Sample size, column D

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#3 8.29.23
2		
3	Column E	B23-12025
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0084
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.111$, $df=7.082$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column E	86.00
17	Difference between means ($E - A$) $\pm$ SEM	-11.00 ± 3.536
18	95% confidence interval	-19.34 to -2.659
19	R squared (eta squared)	0.5775
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.125, 4, 4
23	P value	0.4833
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP#3 8.29.23
2		
3	Column F	B23-12026
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0038
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=3.810, df=6.482
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column F	82.00
17	Difference between means (F - A) $\pm$ SEM	-15.00 $\pm$ 3.937
18	95% confidence interval	-24.46 to -5.538
19	R squared (eta squared)	0.6913
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.875, 4, 4
23	P value	0.3308
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Final Review-59

Welch's t test Tabular results		
1	Table Analyzed	RHMP#3 8.29.23
2		
3	Column G	B23-12055
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1331
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.247$, $df=5.140$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column G	90.00
17	Difference between means ($G - A$) $\pm$ SEM	-7.000 ± 5.612
18	95% confidence interval	-21.31 to 7.310
19	R squared (eta squared)	0.2323
20		
21	F test to compare variances	
22	F, DF _n , DF _d	6.875, 4, 4
23	P value	0.0886
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review: 53

Welch's t test Tabular results	
1	Table Analyzed
2	
3	Column H
4	vs.
5	Column A
6	
7	Unpaired t test with Welch's correction
8	P value
9	P value summary
10	Significantly different ($P < 0.05$)?
11	One- or two-tailed P value?
12	Welch-corrected t, df
13	
14	How big is the difference?
15	Mean of column A
16	Mean of column H
17	Difference between means ($H - A$) $\pm$ SEM
18	95% confidence interval
19	R squared (eta squared)
20	
21	F test to compare variances
22	F, DFn, Dfd
23	P value
24	P value summary
25	Significantly different ($P < 0.05$)?
26	
27	Data analyzed
28	Sample size, column A
29	Sample size, column H

Final Review, 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP#3 8.29.23
2		
3	Column I	B23-12057
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0241
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.333$, $df=7.902$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column I	90.00
17	Difference between means (I - A) $\pm$ SEM	-7.000 ± 3.000
18	95% confidence interval	-13.93 to -0.06709
19	R squared (eta squared)	0.4079
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.250, 4, 4
23	P value	0.8340
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column I	5

Final Review: 53

Welch's t test Tabular results	
1	Table Analyzed
2	
3	Column J
4	vs.
5	Column A
6	
7	Unpaired t test with Welch's correction
8	P value
9	P value summary
10	Significantly different ($P < 0.05$)?
11	One- or two-tailed P value?
12	Welch-corrected t, df
13	
14	How big is the difference?
15	Mean of column A
16	Mean of column J
17	Difference between means (J - A) $\pm$ SEM
18	95% confidence interval
19	R squared (eta squared)
20	
21	F test to compare variances
22	F, DFn, Dfd
23	P value
24	P value summary
25	Significantly different ($P < 0.05$)?
26	
27	Data analyzed
28	Sample size, column A
29	Sample size, column J

Final Review JS

Welch's t test Tabular results		
1	Table Analyzed	Grain Size/Lab Control
2		
3	Column F	Lab Control #3
4	vs.	vs.
5	Column E	Grain Size #3
6		
7	Unpaired t test with Welch's correction	
8	P value	0.2119
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.8485$, $df=7.082$
13		
14	How big is the difference?	
15	Mean of column E	94.00
16	Mean of column F	97.00
17	Difference between means ($F - E$) $\pm$ SEM	3.000 ± 3.536
18	95% confidence interval	-5.341 to 11.34
19	R squared (eta squared)	0.09228
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.125, 4, 4
23	P value	0.4833
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column E	5
29	Sample size, column F	5

Final Review, JS

Survival Counts for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 #3

Start Date/Time: 8/29/2023 1100

Test No. 23-08-052 to -060

End Date/Time: 9/8/2023 1015

Rand #	Survival Counts		QC Counts	
	Start (Day 0)	End (Day 10)	QC (Day 10)	
1	20	18	18	
2	20	17		
3	20	17		
4	20	19		
5	20	15		
6	20	18	18	
7	20	17		
8	20	20		
9	20	18		
10	20	16		
11	20	20	20	
12	20	18		
13	20	18		
14	20	19		
15	20	18		
16	20	19	19	
17	20	16		
18	20	17	17	17
19	20	18		
20	20	18		
21	20	16		10
22	20	17		
23	20	18		
24	20	20		
25	20	20		
26	20	19		19
27	20	16		
28	20	19		
29	20	19		
30	20	19		
31	20	18		18
32	20	17		
33	20	17		
34	20	19		
35	20	19		

Tech Initials: HK/JSF

HK/KMB

RJ

Ammonia Collected:

QC: RJ
Test Start: JSF

Test End: HK/KMB RJ

Comments:

QC Check:

RJ 11/8/23

Datashet: RJ

Final Review:

JS

Test Species: *E. estuarius*

Start Date/Time: 8/29/2023 1100

End Date/Time: 9/8/2023 1015

[illegible]

Tech Initials:	HK/ JF	KYB	RN
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QC: FN

Ammonia Collected: Test Start: 54

Test End: 12

Comments:

QC Check: RN 11/8/23 Datasheet: RN Final Review: JS

~~Amet Foster Wheeler Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117~~

Amec Foster WSP

Water Quality for 10day Amphipod Test

Client: WSP

Project ID: RHMP 2023 # 3

Test No. 23-08-052 to
-060

Test Species: *E. estuarius*

Start Date/Time: 8/29/2023 1100

End Date/Time: 9/8/2023 1015

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
Lab Control	Temp. (°C)	15.2	15.9	15.7	15.7	15.0	15.4	15.5	15.5	15.7	15.5	16.0
	Salinity (ppt)	31.7		31.8		31.8	15.6	32.0		32.7		33.2
	pH (units)	7.67		7.74		7.75		7.63		7.68		7.57
	DO (mg/L)	8.0	7.2	7.4	7.9	7.3	8.0	7.1	7.5	7.3	7.7	8.4
B23-12022	Temp. (°C)	15.1	15.9	15.7	15.7	15.1	15.4	15.5	15.4	15.7	15.4	15.9
	Salinity (ppt)	31.9		32.1		32.1		32.0		33.6		33.6
	pH (units)	7.70		7.75		7.85		7.90		7.77		7.81
	DO (mg/L)	8.1	7.5	7.7	8.2	7.7	8.1	7.4	7.6	7.6	7.7	7.2
B23-12023	Temp. (°C)	15.0	15.9	15.7	15.7	15.0	15.4	15.0	15.3	15.6	15.3	15.3
	Salinity (ppt)	32.0		32.1		32.0		31.9		32.1		32.7
	pH (units)	7.73		7.81		7.94		7.96		7.94		8.04
	DO (mg/L)	8.1	7.7	7.8	7.9	7.5	8.1	7.4	7.8	7.6	7.8	7.4
B23-12024	Temp. (°C)	15.4	16.0	15.7	15.6	14.9	15.4	15.7	15.0	15.5	15.3	15.3
	Salinity (ppt)	31.8		32.3		32.5		32.5		32.6		32.8
	pH (units)	7.67		7.76		7.82		7.79		7.68		7.78
	DO (mg/L)	8.0	7.8	7.8	8.3	7.6	8.0	6.8	7.8	7.6	7.9	7.4
B23-12025	Temp. (°C)	15.0	16.0	15.7	15.6	15.0	15.3	15.7	15.1	15.4	15.4	15.4
	Salinity (ppt)	31.9		32.0		32.2		32.0		33.5		32.7
	pH (units)	7.72		7.68		7.76		7.91		7.88		8.06
	DO (mg/L)	8.0	7.8	7.4	8.3	7.6	8.1	7.4	7.8	7.7	7.9	6.1
B23-12026	Temp. (°C)	15.0	15.8	16.0	16.0	15.0	15.3	15.6	15.2	15.7	15.4	15.4
	Salinity (ppt)	31.9		31.8		32.2		32.1		33.5		32.8
	pH (units)	7.73		7.69		7.88		7.99		8.09		8.21
	DO (mg/L)	8.1	7.9	7.6	8.2	7.7	8.0	7.4	7.8	7.6	7.8	6.7
B23-12055	Temp. (°C)	14.7	14.9	15.8	15.9	15.0	15.1	15.6	15.1	15.9	15.3	16.0
	Salinity (ppt)	32.0		31.9		32.3		32.6		33.2		33.6
	pH (units)	7.71		7.69		7.80		7.85		7.94		7.97
	DO (mg/L)	8.1	7.9	7.8	8.3	7.7	8.0	7.3	7.8	7.8	7.9	7.6
Tech Initials (Initial):		JF	KYB	KYB	KYB	HL	RV	HL	KYB/RV	HL	KYB	HL

Date Animals Received: 8/17/23

Age or Size of Animals: 3-5 mm

Comments: Ⓐ replaced 2 old fans Ⓑ moved fan closer Ⓒ turned room temp down

QC Check: RV 11/8/23

Datasheet: RV

Final Review: JS

Water Quality for 10day Amphipod Test

Client: WSP

Project ID: RHMP 2023 # 3

Test No. 23-08-052 to -060

Test Species: *E. estuarius*

Start Date/Time: 8/29/2023

End Date/Time: 9/8/2023

1100

1015

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
B23-12056	Temp. (°C)	15.0	15.8	15.6	15.7	16.0	15.1	15.2	16.0	15.6	14.8	15.5
	Salinity (ppt)	31.9		31.9		32.3		32.6		32.4		32.8
	pH (units)	7.70		7.69		7.79		7.81		7.67		7.79
	DO (mg/L)	8.2	7.3	7.9	8.0	7.8	8.1	7.4	7.8	7.6	8.0	7.7
B23-12057	Temp. (°C)	15.0	15.8	15.6	15.6	16.0	14.9	15.6	15.7	15.2	14.9	15.4
	Salinity (ppt)	31.9		31.9		32.2		32.4		32.4		34.6
	pH (units)	7.68		7.71		7.74		7.83		7.81		7.88
	DO (mg/L)	8.0	7.6	7.9	8.3	7.9	8.1	7.5	8.0	7.8	8.0	7.9
B23-12058	Temp. (°C)	14.4	15.8	15.7	15.6	16.0	14.9	15.1	15.8	15.2	14.8	15.3
	Salinity (ppt)	32.0		32.2		32.4		32.7		33.3		34.0
	pH (units)	7.72		7.75		7.86		7.94		7.91		8.00
	DO (mg/L)	8.1	7.8	7.9	8.4	7.8	8.1	7.4	8.0	8.1	8.0	8.0
Grain Size Control	Temp. (°C)	15.0	15.7	15.3	15.9	15.2	15.0	15.4	15.7	15.2	14.9	15.6
	Salinity (ppt)	31.9		32.0		32.1		32.1		32.4		33.7
	pH (units)	7.69		7.71		7.78		7.74		7.71		8.85
	DO (mg/L)	8.1	7.8	7.9	8.3	7.6	8.2	7.3	7.9	7.8	8.0	8.0
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											

Tech Initials (Initial):

JF KYB KYB KYB HK RV HK KYB HK KYB HK

Date Animals Received: 8/17/23

Age or Size of Animals: 3-5mm

Comments:

QC Check: RV 11/8/23 Datasheet: RV

Final Review: JS

RV Aimee Foster Wheeler Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

WSP

WSP
RHMP #3 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control	1 46 43 54 34
B23-12022	40 30 38 4 25
B23-12023	20 53 41 16 12
B23-12024	51 2 9 17 42
B23-12025	44 23 13 48 27
B23-12026	10 18 6 22 45

QC Check - Amphipod: RV

WSP
RHMP #3 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12055	55 5 8 24 39
B23-12056	14 47 21 50 15
B23-12057	28 19 26 7 33
B23-12058	37 3 36 49 29
Grain Size Control	35 52 32 31 11

QC HV

QC Check - Amphipod: RN

Ammonia Subsample Analysis - Overlying Water

Client: WSP
 Project ID: RHMP 2023 #2 3
 Test No.: 23-08-052 10-060
 DI Blank: 0.0

Test Species: *E. estuarius*
 Start Date: 8/29/2023 1100
 End Date: 9/8/2023 1015
 10 mg/L Ammonia Stock: 9.94

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃) (x1.22)	Notes
LC	0	1	<1.00	<1.22	10/11/23 MK
B23-12022	0	2	<1.00	<1.22	
B23-12023	0	3	1.89	2.31	
B23-12024	0	4	<1.00	<1.22	
B23-12025	0	5	<1.00	<1.22	
B23-12026	0	6	1.15	1.40	
B23-12055	0	7	<1.00	<1.22	
B23-12056	0	8	<1.00	<1.22	
B23-12057	0	9	<1.00	<1.22	
B23-12058	0	10	<1.00	<1.22	
Grain Size Control	0	11	<1.00	<1.22	
LC	10	12	<1.00	<1.22	
B23-12022	10	13	2.30	2.81	
B23-12023	10	14	6.07	7.41	
B23-12024	10	15	<1.00	<1.22	
B23-12025	10	16	1.81	2.21	
B23-12026	10	17	4.72	5.76	
B23-12055	10	18	<1.00	<1.22	
B23-12056	10	19	<1.00	<1.22	
B23-12057	10	20	<1.00	<1.22	
B23-12058	10	21	2.42	2.95	
Grain Size Control	10	22	<1.00	<1.22	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check: RV 11/18/23 Data sheet: RV Final Review: JS

Ammonia Subsample Analysis - Porewater

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 #3

Start Date: 8/29/2023 11:00

Test No.: 23-03-052 HV-000

End Date: 9/8/2023 1015

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.4

(x 1.22)

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check:

RV 11/8/23

Final Review:

58

Unionized Ammonia Calculation for Pressure of 1 atm															
Input 'Shaded' data															

					Unionized Ammonia Calculation for Pressure of 1 atm																			
					Input 'Shaded' data																			
							I		pK															
							1		9.26															
							2		9.27															
							3		9.28															
							4		9.29															
							5		9.30															
							6		9.32															
							7		9.33															
							8		9.34															
Eoh RHMP #3 Porewater					Total Ammonia (mg/L)		Temp (C)		Salinity (ppt)		pH		Temp (K)		I		I Rounded		pK		Unionized Ammonia		D.O. (mg/L)	
	Log Number	vial	Day	Dilution																				
	Lab Control	23	0	-88		0.50	15.2	32.2	7.36	288.36	7.13	1	9.26	0.003										
	B23-12022	24	0	-88		9.2	15.1	31.8	7.53	288.26	7.05	1	9.26	0.082										
	B23-12023	25	0	-88		14.8	15.0	32.0	7.33	288.16	7.09	1	9.26	0.083										
	B23-12024	26	0	-88		4.1	15.4	32.9	7.40	288.56	7.28	1	9.26	0.028										
	B23-12025	27	0	-88		7.4	15.0	33.0	7.37	288.16	7.30	1	9.26	0.045										
	B23-12026	28	0	-88		12.7	15.0	32.1	7.31	288.16	7.11	1	9.26	0.068										
	B23-12055	29	0	-88		6.1	14.7	32.3	7.39	287.86	7.15	1	9.26	0.038										
	B23-12056	30	0	-88		5.0	15.0	32.5	7.40	288.16	7.20	1	9.26	0.033										
	B23-12057	31	0	-88		5.0	15.0	32.2	7.44	288.16	7.13	1	9.26	0.036										
B23-12058	32	0	-88		9.5	14.4	32.5	7.36	287.56	7.20	1	9.26	0.055											
Grain Size	33	0	-88		4.60	15.0	31.9	7.37	288.16	7.07	1	9.26	0.028											
Data Check: NJ																								
QC: RV																								

Amphipod Batch #4

9/5/23

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP 2023 #4 (09.05.2023)

Species *Eohaustorius estuarius*

Test No. 23-09-001 to -018

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
Lab Control	77	20	19	95	98.0	NA
	37	20	20	100		
	96	20	20	100		
	92	20	20	100		
	53	20	19	95		
B23-12014	39	20	20	100	99.0	101.0
	54	20	20	100		
	10	20	20	100		
	4	20	19	95		
	41	20	20	100		
B23-12047	79	20	12	60	75.0	76.5
	67	20	17	85		
	80	20	14	70		
	56	20	16	80		
	49	20	16	80		
B23-12116	30	20	20	100	94.0	95.9
	59	20	20	100		
	61	20	18	90		
	42	20	19	95		
	70	20	17	85		
B23-12121	87	20	20	100	97.0	99.0
	12	20	19	95		
	26	20	20	100		
	69	20	20	100		
	60	20	18	90		
B23-12122	95	20	19	95	96.0	98.0
	17	20	20	100		
	2	20	19	95		
	94	20	19	95		
	31	20	19	95		
B23-12048	82	20	19	95	89.0	90.8
	75	20	19	95		
	68	20	18	90		
	100	20	14	70		
	76	20	19	95		

Comments: **Bold** indicates statistically significant difference.

QC Check: TD (12/17/2023)

Final Review: JS 4/15/25

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP 2023 #4 (09.05.2023)

Species *Eohaustorius estuarius*

Test No. 23-09-001 to -018

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
B23-12049	50	20	18	90	92.0	93.9
	43	20	20	100		
	25	20	18	90		
	85	20	17	85		
	7	20	19	95		
B23-12050	62	20	17	85	88.0	89.8
	63	20	18	90		
	40	20	18	90		
	24	20	18	90		
	29	20	17	85		
B23-12051	3	20	18	90	88.0	89.8
	52	20	17	85		
	11	20	17	85		
	73	20	17	85		
	72	20	19	95		
B23-12841	18	20	19	95	93.0	94.9
	6	20	17	85		
	14	20	20	100		
	20	20	18	90		
	83	20	19	95		
B23-12053	65	20	19	95	89.0	90.8
	47	20	18	90		
	23	20	19	95		
	16	20	16	80		
	35	20	17	85		
B23-12054	99	20	19	95	94.0	95.9
	81	20	19	95		
	19	20	18	90		
	46	20	19	95		
	93	20	19	95		
B23-12019	66	20	20	100	93.0	94.9
	89	20	17	85		
	34	20	17	85		
	28	20	20	100		
	8	20	19	95		

Comments: **Bold** indicates statistically significant difference.

QC Check: TD (12/17/2023)

Final Review: JS 4/15/25

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP 2023 #4 (09.05.2023)

Species *Eohaustorius estuarius*

Test No. 23-09-001 to -018

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
B23-12020	105	20	19	95	95.0	96.9
	103	20	19	95		
	32	20	20	100		
	38	20	18	90		
	1	20	19	95		
B23-12021	78	20	19	95	94.0	95.9
	45	20	20	100		
	51	20	18	90		
	57	20	19	95		
	98	20	18	90		
B23-12052	48	20	17	85	94.0	95.9
	97	20	20	100		
	58	20	20	100		
	88	20	20	100		
	13	20	17	85		
B23-12123	84	20	17	85	90.0	91.8
	64	20	19	95		
	33	20	18	90		
	36	20	18	90		
	15	20	18	90		
B23-12124	102	20	18	90	89.0	90.8
	101	20	19	95		
	90	20	17	85		
	44	20	18	90		
	9	20	17	85		
LC #2	21	20	20	100	99.0	101.0
	74	20	19	95		
	91	20	20	100		
	71	20	20	100		
	27	20	20	100		
Grain Size	55	20	18	90	93.0	94.9
	104	20	18	90		
	86	20	18	90		
	5	20	20	100		
	22	20	19	95		

Comments: Bold indicates statistically significant difference.

QC Check: TD (12/17/2023)

Final Review: JS 4/15/25

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column B	B23-12014
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.2727
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.6325$, $df=7.692$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column B	99.00
17	Difference between means (B - A) $\pm$ SEM	1.000 ± 1.581
18	95% confidence interval	-2.672 to 4.672
19	R squared (eta squared)	0.04943
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.500, 4, 4
23	P value	0.7040
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Review: 5

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column C	B23-12047
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0027
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=4.960, df=4.597
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column C	75.00
17	Difference between means (C - A) $\pm$ SEM	-23.00 $\pm$ 4.637
18	95% confidence interval	-35.24 to -10.76
19	R squared (eta squared)	0.8426
20		
21	F test to compare variances	
22	F, DFn, Dfd	13.33, 4, 4
23	P value	0.0278
24	P value summary	*
25	Significantly different (P < 0.05)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Final Review: 54

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column D	B23-12116
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1290
9	P value summary	ns
10	Significantly different (P < 0.05)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=1.265, df=5.369
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column D	94.00
17	Difference between means (D - A) $\pm$ SEM	-4.000 $\pm$ 3.162
18	95% confidence interval	-11.96 to 3.964
19	R squared (eta squared)	0.2296
20		
21	F test to compare variances	
22	F, DFn, Dfd	5.667, 4, 4
23	P value	0.1215
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column D	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column E	B23-12121
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.3417
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.4264$, $df=6.630$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column E	97.00
17	Difference between means ($E - A$) $\pm$ SEM	-1.000 ± 2.345
18	95% confidence interval	-6.609 to 4.609
19	R squared (eta squared)	0.02669
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.667, 4, 4
23	P value	0.3651
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

Final Review: IS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column F	B23-12122
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1214
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.265$, $df=7.692$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column F	96.00
17	Difference between means ($F - A$) $\pm$ SEM	-2.000 ± 1.581
18	95% confidence interval	-5.672 to 1.672
19	R squared (eta squared)	0.1722
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.500, 4, 4
23	P value	0.7040
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Final Review 5

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column G	B23-12048
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0691
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.800$, $df=4.509$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column G	89.00
17	Difference between means ($G - A$) $\pm$ SEM	-9.000 ± 5.000
18	95% confidence interval	-22.29 to 4.286
19	R squared (eta squared)	0.4181
20		
21	F test to compare variances	
22	F, DFn, Dfd	15.67, 4, 4
23	P value	0.0207
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column H	B23-12049
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0401
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.121, df=5.753
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column H	92.00
17	Difference between means (H - A) $\pm$ SEM	-6.000 $\pm$ 2.828
18	95% confidence interval	-12.99 to 0.9936
19	R squared (eta squared)	0.4389
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.333, 4, 4
23	P value	0.1846
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column H	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column I	B23-12050
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0002
9	P value summary	***
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=5.774, df=8.000
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column I	88.00
17	Difference between means (I - A) $\pm$ SEM	-10.00 $\pm$ 1.732
18	95% confidence interval	-13.99 to -6.006
19	R squared (eta squared)	0.8065
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.000, 4, 4
23	P value	
24	P value summary	
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column I	5

Final Review.JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column J	B23-12051
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0021
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=4.264$, $df=6.630$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column J	88.00
17	Difference between means (J - A) $\pm$ SEM	-10.00 ± 2.345
18	95% confidence interval	-15.61 to -4.391
19	R squared (eta squared)	0.7328
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.667, 4, 4
23	P value	0.3651
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column J	5

Final Reviews

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column K	B23-12841
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0648
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.768$, $df=5.753$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column K	93.00
17	Difference between means ($K - A$) $\pm$ SEM	-5.000 ± 2.828
18	95% confidence interval	-11.99 to 1.994
19	R squared (eta squared)	0.3520
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.333, 4, 4
23	P value	0.1846
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column K	5

Final Review: TS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column L	B23-12053
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0166
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.846$, $df=5.369$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column L	89.00
17	Difference between means (L - A) $\pm$ SEM	-9.000 ± 3.162
18	95% confidence interval	-16.96 to -1.036
19	R squared (eta squared)	0.6014
20		
21	F test to compare variances	
22	F, DFn, Dfd	5.667, 4, 4
23	P value	0.1215
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column L	5

Fungal Review: 59

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column M	B23-12054
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0182
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.530$, $df=7.692$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column M	94.00
17	Difference between means ($M - A$) $\pm$ SEM	-4.000 ± 1.581
18	95% confidence interval	-7.672 to -0.3283
19	R squared (eta squared)	0.4541
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.500, 4, 4
23	P value	0.7040
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column M	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column N	B23-12019
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1119
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.387$, $df=5.026$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column N	93.00
17	Difference between means ($N - A$) $\pm$ SEM	-5.000 ± 3.606
18	95% confidence interval	-14.25 to 4.254
19	R squared (eta squared)	0.2767
20		
21	F test to compare variances	
22	F, DFn, Dfd	7.667, 4, 4
23	P value	0.0737
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column N	5

Final Review: IS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column O	B23-12020
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0872
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.500$, $df=7.529$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column O	95.00
17	Difference between means (O - A) $\pm$ SEM	-3.000 ± 2.000
18	95% confidence interval	-7.663 to 1.663
19	R squared (eta squared)	0.2301
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.667, 4, 4
23	P value	0.6328
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column O	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column P	B23-12021
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0587
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.789$, $df=6.897$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column P	94.00
17	Difference between means ($P - A$) $\pm$ SEM	-4.000 ± 2.236
18	95% confidence interval	-9.304 to 1.304
19	R squared (eta squared)	0.3169
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.333, 4, 4
23	P value	0.4320
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column P	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column Q	B23-12052
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1751
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.033$, $df=4.878$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column Q	94.00
17	Difference between means ($Q - A$) $\pm$ SEM	-4.000 ± 3.873
18	95% confidence interval	-14.03 to 6.031
19	R squared (eta squared)	0.1794
20		
21	F test to compare variances	
22	F, DFn, Dfd	9.000, 4, 4
23	P value	0.0560
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column Q	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column R	B23-12123
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0022
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=4.000, df=7.529
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column R	90.00
17	Difference between means (R - A) $\pm$ SEM	-8.000 $\pm$ 2.000
18	95% confidence interval	-12.66 to -3.337
19	R squared (eta squared)	0.6800
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.667, 4, 4
23	P value	0.6328
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column R	5

Final Review TS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#4 9.5.23
2		
3	Column S	B23-12124
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0026
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=4.025, df=6.897
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column S	89.00
17	Difference between means (S - A) $\pm$ SEM	-9.000 $\pm$ 2.236
18	95% confidence interval	-14.30 to -3.696
19	R squared (eta squared)	0.7014
20		
21	F test to compare variances	
22	F, DF _n , DF _d	2.333, 4, 4
23	P value	0.4320
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column S	5

Welch's t test Tabular results		
1	Table Analyzed	Grain Size/Lab Control
2		
3	Column H	Grain Size #4
4	vs.	vs.
5	Column G	Lab Control #4
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0363
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.132$, $df=6.630$
13		
14	How big is the difference?	
15	Mean of column G	98.00
16	Mean of column H	93.00
17	Difference between means ($H - G$) $\pm$ SEM	-5.000 ± 2.345
18	95% confidence interval	-10.61 to 0.6089
19	R squared (eta squared)	0.4067
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.667, 4, 4
23	P value	0.3651
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column G	5
29	Sample size, column H	5

Final Review: 55

Water Quality for 10day Amphipod Test

Client: WSP

Project ID: RHMP 2023 #34

Test No. 23-09-001 to 018

Test Species: *E. estuarius*

Start Date/Time: 9/5/2023 1245

End Date/Time: 9/15/2023 1030

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
Lab Control	Temp. (°C)	16.0	16.0	15.0	16.0	14.9	15.2	15.2	14.5	14.7	15.8	15.9
	Salinity (ppt)	31.8		31.8		31.9		31.9		31.8		32.0
	pH (units)	7.67		7.77		7.64		7.83		7.75		7.71
	DO (mg/L)	7.7	7.6	8.0	7.6	7.8	8.0	7.8	8.0	8.0	7.9	7.9
B23-12014	Temp. (°C)	15.9	15.0	15.0	16.0	14.6	15.3	14.8	14.7	14.9	15.8	15.6
	Salinity (ppt)	31.9		31.9		32.0		32.0		32.0		32.2
	pH (units)	7.68		7.77		7.78		7.87		7.79		7.79
	DO (mg/L)	7.8	7.9	8.1	7.6	7.8	8.1	8.0	8.1	8.2	7.9	7.9
B23-12047	Temp. (°C)	15.9	15.5	15.0	16.0	15.4	15.8	15.5	14.8	15.4	15.5	16.0
	Salinity (ppt)	31.9		32.0		31.8		32.2		32.3		32.4
	pH (units)	7.69		7.77		7.50		7.89		7.84		7.74
	DO (mg/L)	7.9	7.9	8.0	7.6	7.6	8.0	7.9	8.2	7.9	8.0	7.7
B23-12116	Temp. (°C)	15.9	15.7	15.0	16.0	15.7	15.5	15.3	14.9	15.2	16.0	15.9
	Salinity (ppt)	31.9		32.0		31.7		32.0		32.1		32.4
	pH (units)	7.84		7.79		7.76		7.88		7.89		7.89
	DO (mg/L)	7.0	7.7	8.0	7.6	7.1	8.0	7.9	8.1	8.1	7.8	7.4
B23-12121	Temp. (°C)	15.8	15.3	14.9	15.7	15.2	15.5	14.9	15.0	15.0	16.0	15.3
	Salinity (ppt)	31.7		32.0		31.7		31.9		32.1		32.2
	pH (units)	7.65		7.81		7.55		7.78		7.93		7.89
	DO (mg/L)	7.5	7.9	8.0	7.4	7.8	8.0	8.0	8.1	8.1	7.8	7.7
B23-12122	Temp. (°C)	15.4	15.2	14.8	15.6	14.5	15.0	14.6	14.7	14.6	16.0	15.8
	Salinity (ppt)	31.9		32.0		32.1		32.0		32.1		32.1
	pH (units)	7.71		7.80		7.81		7.85		7.88		7.87
	DO (mg/L)	7.9	7.6	8.1	7.7	7.7	8.0	8.1	8.2	8.2	7.8	7.8
B23-12048	Temp. (°C)	15.7	15.1	14.8	15.4	15.0	14.9	14.5	14.6	14.6	15.9	15.6
	Salinity (ppt)	31.8		32.0		31.9		32.0		32.1		32.1
	pH (units)	7.67		7.76		7.74		7.86		7.78		7.74
	DO (mg/L)	7.6	7.2	8.1	7.7	7.7	8.1	8.1	8.2	8.2	7.8	7.9

Tech Initials (Initial):

Date Animals Received: 8/31/23

Age or Size of Animals: 3-5 mm

Comments:

QC Check: MK 12/20/23

Final Review: JS

Water Quality for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 #34

Start Date/Time: 9/5/2023 1245

Test No. 23-09-001 to -018

End Date/Time: 9/15/2023 1030

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
B23-12049	Temp. (°C)	15.7	15.2	15.1	15.0	15.2	15.2	14.5	14.6	14.6	15.5	16.15
	Salinity (ppt)	31.9		32.0		31.8		31.9		32.0		32.1
	pH (units)	7.69		7.72		7.73		7.85		7.76		7.73
	DO (mg/L)	7.9	8.0	7.9	7.9	8.0	8.0	8.1	7.9	8.2	8.0	8.0
B23-12050	Temp. (°C)	15.7	15.5	14.9	15.3	15.2	15.1	14.5	14.6	14.8	15.9	16.0
	Salinity (ppt)	32.0		32.0		31.9		32.2		32.3		32.2
	pH (units)	7.68		7.71		7.75		7.82		7.73		7.61
	DO (mg/L)	7.9	8.0	7.9	7.8	8.0	8.1	8.2	8.1	8.2	7.9	7.6
B23-12051	Temp. (°C)	16.4	14.9	14.9	15.4	15.2	14.9	14.6	14.7	15.6	15.5	15.8
	Salinity (ppt)	32.3		32.0		31.9		32.1		32.0		32.2
	pH (units)	7.71		7.73		7.71		7.82		7.70		7.63
	DO (mg/L)	6.3	8.1	7.9	7.9	7.7	8.2	8.2	8.2	8.1	8.0	7.5
B23-12841	Temp. (°C)	16.3	15.0	14.9	15.4	15.6	15.1	14.7	14.7	15.3	16.0	15.6
	Salinity (ppt)	31.9		32.0		31.9		32.3		32.2		32.5
	pH (units)	7.68		7.76		7.79		7.83		7.76		7.64
	DO (mg/L)	7.7	8.1	7.8	7.9	7.8	8.2	8.0	8.2	8.1	7.8	7.8
B23-12053	Temp. (°C)	16.0	14.9	14.9	15.9	15.9	15.9	15.7	14.8	15.5	15.8	15.9
	Salinity (ppt)	31.9		32.0		32.0		32.0		32.1		32.2
	pH (units)	7.67		7.74		7.76		7.81		7.77		7.65
	DO (mg/L)	7.8	8.1	8.1	7.9	7.8	8.0	7.9	8.2	8.0	7.8	6.9
B23-12054	Temp. (°C)	16.0	14.9	15.0	16.0	16.0	15.7	15.5	15.6	15.6	15.4	16.0
	Salinity (ppt)	31.9		32.1		31.7		32.2		32.3		32.5
	pH (units)	7.69		7.75		7.80		7.83		7.79		7.73
	DO (mg/L)	7.9	8.1	8.1	8.0	7.7	8.0	7.9	8.1	8.0	7.7	7.3
B23-12019	Temp. (°C)	15.9	14.7	15.0	16.0	15.9	15.7	15.6	15.6	15.4	15.5	15.7
	Salinity (ppt)	31.9		32.0		31.9		32.0		32.1		32.3
	pH (units)	7.70		7.78		7.83		7.85		7.80		7.73
	DO (mg/L)	7.9	8.2	8.0	7.8	7.9	8.0	8.0	8.1	8.0	7.5	7.3
Tech Initials (Initial):		KYB	HK	KYB	RV	HK	JF	KYB	KYB	KYB	HK	KYB

Date Animals Received: 8/31/23

Age or Size of Animals: 3-5mm

Comments:

QC Check:

Final Review:

Water Quality for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 # 34

Start Date/Time: 9/5/2023 1245

Test No. 23-09-001 to -018

End Date/Time: 9/15/2023 1030

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
Lab Control #2	Temp. (°C)	16.0	15.1	15.2	15.0	15.4	15.5	15.1	15.2	15.3	16.0	15.1
	Salinity (ppt)	32.0		31.9		31.8		32.0		32.0		32.1
	pH (units)	7.74		7.72		7.82		7.85		7.80		7.74
	DO (mg/L)	7.9	8.1	7.8	7.9	8.0	8.0	8.1	8.0	8.1	7.7	7.8
B23-12020	Temp. (°C)	15.8	15.1	15.0	15.4	15.0	15.1	14.9	14.8	15.3	15.8	14.8
	Salinity (ppt)	31.9		32.0		32.0		32.1		32.2		32.3
	pH (units)	7.71		7.78		7.85		7.87		7.82		7.76
	DO (mg/L)	7.9	8.1	8.0	7.9	8.1	8.1	8.1	8.1	8.1	7.6	7.9
B23-12021	Temp. (°C)	15.8	15.0	14.9	15.3	15.5	15.4	14.9	14.9	15.5	16.0	15.6
	Salinity (ppt)	31.9		32.0		31.8		32.1		32.2		32.3
	pH (units)	7.70		7.77		7.84		7.86		7.83		7.76
	DO (mg/L)	7.9	8.1	8.0	8.0	7.9	8.0	8.1	8.1	8.2	7.7	7.9
B23-12052	Temp. (°C)	15.9	16.0	15.1	15.1	15.0	15.0	14.9	14.9	15.4	15.6	15.7
	Salinity (ppt)	32.0		32.0		32.0		32.3		32.2		32.5
	pH (units)	7.70		7.75		7.82		7.84		7.73		7.74
	DO (mg/L)	7.9	7.7	7.9	8.0	8.0	8.1	8.0	8.2	7.9	7.6	7.9
B23-12123	Temp. (°C)	15.8	15.5	15.1	15.1	15.3	15.0	14.9	15.3	15.7	15.7	15.8
	Salinity (ppt)	32.0		32.0		32.0		32.2		32.1		32.3
	pH (units)	7.70		7.71		7.75		7.83		7.74		7.73
	DO (mg/L)	7.9	8.0	7.6	7.9	7.8	8.0	8.0	8.0	8.0	7.6	7.8
B23-12124	Temp. (°C)	16.0	15.3	15.4	15.1	15.2	15.3	14.8	15.3	15.4	15.6	15.8
	Salinity (ppt)	31.9		32.0		31.9		32.3		32.2		32.5
	pH (units)	7.71		7.76		7.80		7.85		7.76		7.70
	DO (mg/L)	7.9	7.9	7.9	7.9	7.7	8.0	8.1	8.0	8.1	7.8	7.9
Grain Size Control	Temp. (°C)	16.0	15.3	15.4	15.2	15.1	15.0	14.8	15.3	15.3	14.9	15.8
	Salinity (ppt)	32.0		32.1		32.0		32.4		32.4		32.4
	pH (units)	7.71		7.75		7.79		7.84		7.73		7.72
	DO (mg/L)	7.9	8.0	8.0	7.9	8.0	8.0	8.1	8.0	8.1	7.7	7.8
Tech Initials (Initial):		KYB	HK	KYB	RN	HK	JF	KYB	KYB	KYB	HK	KYB

Date Animals Received: 8/31/23

Age or Size of Animals: 3-5 mm

Comments:

QC Check: MLC 12/20/23

Final Review: JS

WSP
Amec Foster Wheeler Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

Survival Counts for 10day Amphipod Test

Client: WSP
Project ID: RHMP 2023 #4
Test No. 23-09-001 to -018

Test Species: *E. estuarius*
Start Date/Time: 9/5/2023 1245
End Date/Time: 9/15/2023 1000 ~~1030~~

Rand #	Survival Counts		QC Counts
	Start (Day 0)	End (Day 10)	QC (Day 10)
1	20	19	19
2	20	19	
3	20	18	
4	20	19	
5	20	20	
6	20	17	17
7	20	19	
8	20	19	
9	20	17	
10	20	20	
11	20	17	17
12	20	19	
13	20	17	
14	20	20	
15	20	18	
16	20	17 ^{16 JF}	16
17	20	20	
18	20	19	
19	20	18	
20	20	18	
21	20	20	20
22	20	19	
23	20	19	
24	20	18	
25	20	18	
26	20	20	20
27	20	20	
28	20	20	
29	20	17	
30	20	20	
31	20	19	19
32	20	20	
33	20	18	
34	20	17	
35	20	17	

Tech Initials: JF JF RV

Ammonia Collected: AC:RV Test Start: JF Test End: HK/RV

Comments: B23-12047 surrogate = 15/20
B23-12048 surrogate = 16/20

QC Check: MF 12/20/23

Final Review: JS

Survival Counts for 10day Amphipod Test

Client: WSP
Project ID: RHMP 2023 #4
Test No. 23-09-001 to -018

Test Species: *E. estuarius*
Start Date/Time: 9/5/2023 1245
End Date/Time: 9/15/2023 1000^{AM} 1030

Rand #	Survival Counts		QC Counts
	Start (Day 0)	End (Day 10)	QC (Day 10)
36	20	18	18
37	20	20	
38	20	18	
39	20	20	
40	20	18	
41	20	20	20
42	20	19	
43	20	20	
44	20	18	
45	20	20	
46	20	19	19
47	20	18	
48	20	17	
49	20	16	
50	20	18	
51	20	18	18
52	20	17	
53	20	19	
54	20	20	
55	20	18	
56	20	16	16
57	20	19	
58	20	20	
59	20	20	
60	20	18	
61	20	18	18
62	20	17	
63	20	18	
64	20	19	
65	20	19	
66	20	20	20
67	20	17	
68	20	18	
69	20	20	
70	20	17	
Tech Initials: JF KYB			RN

Ammonia Collected: Test Start: JF Test End: HK

Comments:

QC Check: MK 12/20/23 Final Review: JS
WSP
Amec Foster Wheeler Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

Survival Counts for 10day Amphipod Test

Client: WSP
Project ID: RHMP 2023 #4
Test No. 23-09-001 to -018

Test Species: *E. estuarius*
Start Date/Time: 9/5/2023 1245
End Date/Time: 9/15/2023 1030

Rand #	Survival Counts		QC Counts
	Start (Day 0)	End (Day 10)	QC (Day 10)
71	20	20	
72	20	19	
73	20	17	17
74	20	19	
75	20	19	
76	20	19	
77	20	19	
78	20	19	
79	20	12	12
80	20	14	
81	20	19	
82	20	19	
83	20	19	
84	20	17	17
85	20	17	
86	20	18	18
87	20	20	
88	20	20	
89	20	17	
90	20	17	
91	20	20	
92	20	20	
93	20	19	19
94	20	19	
95	20	19	
96	20	20	
97	20	20	
98	20	18	
99	20	19	
100	20	14	14
101	20	19	
102	20	18	18
103	20	19	
104	20	18	
105	20	19	

Tech Initials: JF KYB/ TJD

QC: RN JF

Ammonia Collected: Test Start: JF Test End: R/HK

Comments:

QC Check: MK 12/20/23

Final Review: JS

WSP
RHMP #4 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control ✖	77
	37
	96
	92
	53
✓ B23-12014	39
	54
	10
	4
	41
✓ B23-12047	79
	67
	80
	56
	49
✓ B23-12116	30
	59
	61
	42
	70
✓ B23-12121	87
	12
	26
	69
	60
✓ B23-12122	95
	17
	2
	94
	31

QC Check - Amphipod: ✓

WSP
RHMP #4 Sediment Testing
Random Numbers

	SAMPLE ID	Rand#
✓	B23-12048	82 75 68 100 76
✓	B23-12049	50 43 25 85 7
✓	B23-12050	62 63 40 24 29
✓	B23-12051	3 52 11 73 72
✓	B23-12841	18 6 14 20 83
✓	B23-12053	65 47 23 16 35

QC Check - Amphipod: R✓

WSP
RHMP #4 Sediment Testing
Random Numbers

	SAMPLE ID	Rand#
✓	B23-12054	99 81 19 46 93
✓	B23-12019	66 89 34 28 8
✓	B23-12020	105 103 32 38 1
✓	B23-12021	78 45 51 57 98
✓	B23-12052	48 97 58 88 13
✓	B23-12123	84 64 33 36 15

QC Check - Amphipod: RV

WSP
RHMP #4 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12124	102
	101
	90
	44
	9
Lab Control #2	21
	74
	91
	71
	27
Grain Size Control	55
	104
	86
	5
	22

QC Check - Amphipod: RV

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: E. estuarius

Project ID: RHMP 2023 #4

Start Date: 9/5/2023 1245

Test No.: 23-09-001 To - 018

End Date: 9/15/2023 1030

DI Blank: ~~0.026 x 1.22 = 0.03~~ 0.0

10 mg/L Ammonia Stock: 9.24

(x1.22)

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃)	Notes
Lab Control #1	0	1	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12014	0	2	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12047	0	3	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12116	0	4	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12121	0	5	<u>1.21</u>	<u>1.48</u>	
B23-12122	0	6	<u>1.11</u>	<u>1.35</u>	
B23-12048	0	7	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12049	0	8	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12050	0	9	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12051	0	10	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12841	0	11	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12053	0	12	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12054	0	13	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12019	0	14	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12020	0	15	2.0 <u>2.0</u> 2.0 <u>2.0</u> 2.0 <u>2.0</u>	<u><1.22</u>	
B23-12021	0	16	<u><1.0</u>	<u><1.22</u>	
B23-12052	0	17	<u><1.0</u>	<u><1.22</u>	
B23-12123	0	18	<u><1.0</u>	<u><1.22</u>	
B23-12124	0	19	<u><1.0</u>	<u><1.22</u>	
Lab Control #2	0	20	<u><1.0</u>	<u><1.22</u>	
Grain Size Control	0	21	<u><1.0</u>	<u><1.22</u>	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments: 1.0 mg/L

QC Check: ME 12/20/23

Final Review: _____

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: E. estuarius

Project ID: RHMP 2023 #4

Start Date: 9/5/2023 1245

Test No.: 23-09-001 to 018

End Date: 9/15/2023 1030

DI Blank: 20.03^{mk} 0.0

10 mg/L Ammonia Stock: 9.24

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃) (x1.22)	Notes
Lab Control #1	10	22	<1.0	<1.22	
B23-12014	10	23	<1.0	<1.22	
B23-12047	10	24	<1.0	<1.22	
B23-12116	10	25	1.98	2.42	
B23-12121	10	26	4.99	6.09	
B23-12122	10	27	2.23	2.72	
B23-12048	10	28	<1.0	<1.22	
B23-12049	10	29	<1.0	<1.22	
B23-12050	10	30	<1.0	<1.22	
B23-12051	10	31	<1.0	<1.22	
B23-12841	10	32	<1.0	<1.22	
B23-12053	10	33	<1.0	<1.22	
B23-12054	10	34	<1.0	<1.22	
B23-12019	10	35	<1.0	<1.22	
B23-12020	10	36	<1.0	<1.22	
B23-12021	10	37	2.08 ← 2.08 ^{mk}	2.54	
B23-12052	10	38	<1.0	<1.22	
B23-12123	10	39	<1.0	<1.22	
B23-12124	10	40	<1.0	<1.22	
Lab Control #2	10	41	<1.0	<1.22	
Grain Size Control	10	42	<1.0	<1.22	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments: 1.0^{mk}

QC Check: ML 11/20/23

Final Review: JS

Ammonia Subsample Analysis - Porewater

Client: WSP
 Project ID: RHMP 2023 #4
 Test No.: 23-09-001 to -018

Test Species: E. estuarius
 Start Date: 9/5/2023 1245
 End Date: 9/15/2023 1030

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.3
 (x 1.22)

Sample ID	Test Day	Vial #	pH (units)	Salinity (ppt)	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃)	Notes
Lab Control #1	0	43	7.51	31.6	<0.4	^{MF} <0.5 0.44	AL6
B23-12014	0	44	7.64	31.4	<0.4	^{MF} <0.5 0.49	
B23-12047	0	45	7.36	32.5	4.3	5.25	
B23-12116	0	46	7.47	32.3	7.0	8.54	
B23-12121	0	47	7.51	32.3	10.0	12.20	
B23-12122	0	48	7.54	31.6	8.8	10.74	
B23-12048	0	49	7.27	32.0	1.9	2.32	
B23-12049	0	50	7.38	31.8	3.2	3.90	
B23-12050	0	51	7.07	32.7	1.8	2.20	
B23-12051	0	52	7.08	32.4	1.8	2.20	
B23-12841	0	53	7.48	32.4	4.0	^{MF} 4.9 4.88	
B23-12053	0	54	7.21	32.5	2.6	^{MF} 3.2 3.17	
B23-12054	0	55	7.21	32.5	3.1	^{MF} 3.8 3.78	
B23-12019	0	56	7.49	31.7	4.3	5.25	
B23-12020	0	57	7.52	31.8	5.7	^{MF} 7.0 6.95	
B23-12021	0	58	7.62	31.4	5.9	^{MF} 7.20 4.39 ^{MF} 7.20	
B23-12052	0	59	7.38	31.4	3.6	^{MF} 4.4 4.39	
B23-12123	0	60	7.33	32.0	3.3	4.03	
B23-12124	0	61	7.40	31.5	2.9	3.54	
Lab Control #2	0	62	7.44	31.8	<0.4	^{MF} <0.5 <0.44	
Grain Size Control	0	63	7.32	32.2	3.8	4.64	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check: MF 12/20/23

Final Review: JS

[illegible]

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Amphipod Batch #5

9/12/23

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP #5 (9.12.2023)

Species *Eohaustorius estuarius*

Test No. 23-09-037 to -046

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
Lab Control	53	20	20	100	97.0	NA
	28	20	19	95		
	31	20	19	95		
	33	20	19	95		
	18	20	20	100		
B23-12117	50	20	18	90	93.0	95.9
	9	30	30	100		
	14	20	16	80		
	54	20	20	100		
	44	20	19	95		
B23-12118	42	20	19	95	87.0	89.7
	29	20	18	90		
	41	20	17	85		
	6	20	19	95		
	26	20	14	70		
B23-12119	52	20	19	95	89.0	91.8
	25	20	15	75		
	12	20	18	90		
	32	20	19	95		
	39	20	18	90		
B23-12120	2	20	18	90	82.0	84.5
	11	20	15	75		
	30	20	18	90		
	36	20	15	75		
	57	20	16	80		
B23-12114	13	20	17	85	81.0	83.5
	22	20	16	80		
	58	20	16	80		
	8	20	16	80		
	38	20	16	80		
B23-12115	34	20	12	60	67.0	69.1
	27	20	17	85		
	5	20	12	60		
	10	20	14	70		
	43	20	12	60		

Notes: **Bold** indicates statistically significant difference.

QC Check: TD (12/17/23)

Final Review: MSK

WSP USA Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP #5 (9.12.2023)

Species *Eohaustorius estuarius*

Test No. 23-09-037 to -046

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
B23-12009	49	20	17	85	91.0	93.8
	1	20	19	95		
	17	20	19	95		
	20	20	18	90		
	59	20	18	90		
B23-12010	4	20	18	90	86.0	88.7
	48	20	16	80		
	7	20	16	80		
	37	20	18	90		
	24	20	18	90		
B23-12011	51	20	19	95	89.0	91.8
	19	20	17	85		
	46	20	16	80		
	60	20	18	90		
	21	20	19	95		
B23-12012	23	20	19	95	99.0	102.1
	3	20	20	100		
	47	20	20	100		
	15	20	20	100		
	45	20	20	100		
Grain Size	56	20	18	90	95.0	97.9
	40	20	18	90		
	35	20	19	95		
	16	20	20	100		
	55	20	20	100		

Notes: **Bold** indicates statistically significant difference.

QC Check: TD (12/17/23)

Final Review: MSK

Welch's t test Tabular results		
1	Table Analyzed	RHMP#5 9.12.23
2		
3	Column B	B23-12117
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1788
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.016$, $df=4.847$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column B	93.00
17	Difference between means ($B - A$) $\pm$ SEM	-4.000 ± 3.937
18	95% confidence interval	-14.22 to 6.217
19	R squared (eta squared)	0.1756
20		
21	F test to compare variances	
22	F, DFn, Dfd	9.333, 4, 4
23	P value	0.0526
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#5 9.12.23
2		
3	Column C	B23-12118
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0485
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.085$, $df=4.555$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column C	87.00
17	Difference between means (C - A) $\pm$ SEM	-10.00 ± 4.796
18	95% confidence interval	-22.70 to 2.699
19	R squared (eta squared)	0.4883
20		
21	F test to compare variances	
22	F, DFn, Dfd	14.33, 4, 4
23	P value	0.0244
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Fingl Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP#5 9.12.23
2		
3	Column D	B23-12119
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0476
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.066$, $df=4.878$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column D	89.00
17	Difference between means ($D - A$) $\pm$ SEM	-8.000 ± 3.873
18	95% confidence interval	-18.03 to 2.031
19	R squared (eta squared)	0.4666
20		
21	F test to compare variances	
22	F, DFn, Dfd	9.000, 4, 4
23	P value	0.0560
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column D	5

Fungal Review SS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#5 9.12.23
2		
3	Column E	B23-12120
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0044
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=4.160, df=5.026
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column E	82.00
17	Difference between means (E - A) $\pm$ SEM	-15.00 $\pm$ 3.606
18	95% confidence interval	-24.25 to -5.746
19	R squared (eta squared)	0.7750
20		
21	F test to compare variances	
22	F, DFn, Dfd	7.667, 4, 4
23	P value	0.0737
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

Fingl reviews

Welch's t test Tabular results		
1	Table Analyzed	RHMP#5 9.12.23
2		
3	Column F	B23-12114
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	<0.0001
9	P value summary	****
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=10.12, df=7.692
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column F	81.00
17	Difference between means (F - A) $\pm$ SEM	-16.00 $\pm$ 1.581
18	95% confidence interval	-19.67 to -12.33
19	R squared (eta squared)	0.9301
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.500, 4, 4
23	P value	0.7040
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Ping I Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#5 9.12.23
2		
3	Column G	B23-12115
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0014
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=5.941, df=4.498
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column G	67.00
17	Difference between means ($G - A$) $\pm$ SEM	-30.00 $\pm$ 5.050
18	95% confidence interval	-43.43 to -16.57
19	R squared (eta squared)	0.8870
20		
21	F test to compare variances	
22	F, DFn, Dfd	16.00, 4, 4
23	P value	0.0199
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#5 9.12.23
2		
3	Column H	B23-12009
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0159
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.683$, $df=6.897$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column H	91.00
17	Difference between means ($H - A$) $\pm$ SEM	-6.000 ± 2.236
18	95% confidence interval	-11.30 to -0.6964
19	R squared (eta squared)	0.5108
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.333, 4, 4
23	P value	0.4320
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column H	5

Final Review- 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP#5 9.12.23
2		
3	Column I	B23-12010
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0036
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=4.017$, $df=5.882$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column I	86.00
17	Difference between means (I - A) $\pm$ SEM	-11.00 ± 2.739
18	95% confidence interval	-17.73 to -4.266
19	R squared (eta squared)	0.7328
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.000, 4, 4
23	P value	0.2080
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column I	5

Final Review: IS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#5 9.12.23
2		
3	Column J	B23-12011
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0246
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.530$, $df=5.369$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column J	89.00
17	Difference between means ($J - A$) $\pm$ SEM	-8.000 ± 3.162
18	95% confidence interval	-15.96 to -0.03636
19	R squared (eta squared)	0.5438
20		
21	F test to compare variances	
22	F, DFn, Dfd	5.667, 4, 4
23	P value	0.1215
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column J	5

P. ng 1 Review JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP#5 9.12.23
2		
3	Column K	B23-12012
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1214
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.265$, $df=7.692$
13		
14	How big is the difference?	
15	Mean of column A	97.00
16	Mean of column K	99.00
17	Difference between means ($K - A$) $\pm$ SEM	2.000 ± 1.581
18	95% confidence interval	-1.672 to 5.672
19	R squared (eta squared)	0.1722
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.500, 4, 4
23	P value	0.7040
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column K	5

Final Review JS

Welch's t test Tabular results		
1	Table Analyzed	Grain Size/Lab Control
2		
3	Column J	Lab Control #5
4	vs.	vs.
5	Column I	Grain Size #5
6		
7	Unpaired t test with Welch's correction	
8	P value	0.2308
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.7845$, $df=6.202$
13		
14	How big is the difference?	
15	Mean of column I	95.00
16	Mean of column J	97.00
17	Difference between means (J - I) $\pm$ SEM	2.000 ± 2.550
18	95% confidence interval	-4.190 to 8.190
19	R squared (eta squared)	0.09027
20		
21	F test to compare variances	
22	F, DFn, Dfd	3.333, 4, 4
23	P value	0.2704
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column I	5
29	Sample size, column J	5

Survival Counts for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 #5

Start Date/Time: 9/12/2023 1030

Test No. 23-09-037 to 046

End Date/Time: 9/22/2023 1030

[illegible]

Tech Initials:

Ammonia Collected:

Test Start

Test End:

Comments:

273-12118 SURVY: 19

B73-12120 RVR: 14

B23-12115 SURR: 14

QC Check:

AK 12/10/13

Final Review:

Survival Counts for 10day Amphipod Test

Client: WSP
Project ID: RHMP 2023 #5
Test No. 23-09-037 to -046

Test Species: *E. estuarius*
Start Date/Time: 9/12/2023 1030
End Date/Time: 9/22/2023 1030

Rand #	Survival Counts		QC Counts
	Start (Day 0)	End (Day 10)	QC (Day 10)
1	20	19	19
2	20	19	
3	20	20	
4	20	18	
5	20	12	
6	20	HK 19	19
7	20	16	
8	20	16	
9	20-30	HK 29 30	
10	20	14	
11	20	15	15
12	20	18	
13	20	17	
14	20	HK 17 16	
15	20	20	
16	20	HK 19 20	20
17	20	19	
18	20	20	
19	20	17	
20	20	18	
21	20	19	19
22	20	16	
23	20	19	
24	20	18	
25	20	15	
26	20	14	14
27	20	17	
28	20	19	
29	20	18	
30	20	18	
31	20	19	19
32	20	19	
33	20	19	
34	20	12	
35	20	19	

Tech Initials:

HK

HK

JF

Ammonia Collected:

Test Start:

HK

Test End:

MK/AB

Comments:

QC Check: MK 12/20/23

Final Review:

[Signature]

Water Quality for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP #5

Start Date/Time: 9/12/2023 1030

Test No. 23-09-037 to -046

End Date/Time: 9/22/2023 1030

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
Lab Control	Temp. (°C)	15.2	15.0	14.7	15.8	15.3	16.0	15.3	16.0	15.2	16.4	15.9
	Salinity (ppt)	31.8	31.9	31.9	-	32.0	-	32.0	-	32.7	-	32.1
	pH (units)	7.61	7.75	7.66	-	7.81	-	7.59	-	7.55	-	7.69
	DO (mg/L)	8.0	8.1	7.5	7.9	7.7	7.5	7.5	7.4	7.9	7.4	7.5
Grain Size Control	Temp. (°C)	14.9	15.1	14.8	15.7	16.4	16.0	15.1	16.0	15.0	15.7	15.7
	Salinity (ppt)	31.9	32.1	32.2	-	32.4	-	32.4	-	32.6	-	32.5
	pH (units)	7.63	7.75	7.74	-	7.79	-	7.58	-	7.52	-	7.81
	DO (mg/L)	7.9	8.1	7.6	7.9	7.9	7.6	8.1	7.4	7.8	7.5	8.0
B23- 12117	Temp. (°C)	15.2	15.1	14.9	15.8	16.1	15.8	15.5	15.9	14.9	15.2	15.3
	Salinity (ppt)	31.9	32.0	32.0	-	31.6	-	32.1	-	32.3	-	32.3
	pH (units)	7.64	7.77	7.76	-	7.75	-	7.60	-	7.62	-	7.84
	DO (mg/L)	8.0	8.1	7.5	7.9	7.7	7.6	8.0	7.5	7.9	7.9	8.0
B23-12118	Temp. (°C)	15.2	15.2	15.3	15.8	15.9	15.7	15.6	15.9	14.8	15.2	15.3
	Salinity (ppt)	31.9	32.1	31.9	-	32.4	-	32.3	-	32.9	-	32.7
	pH (units)	7.64	7.77	7.74	-	7.80	-	7.62	-	7.62	-	7.84
	DO (mg/L)	7.9	8.1	7.5	7.9	7.8	7.7	8.0	7.4	8.0	7.9	8.1
B23- 12119	Temp. (°C)	15.3	15.4	15.5	16.0	16.1	15.7	15.5	15.9	14.9	15.0	15.2
	Salinity (ppt)	31.8	31.9	32.0	-	32.0	-	32.0	-	32.2	-	32.5
	pH (units)	7.63	7.76	7.78	-	7.82	-	7.67	-	7.66	-	7.86
	DO (mg/L)	7.9	8.1	7.4	7.9	7.7	7.7	7.9	7.5	8.0	7.9	8.1
B23-12120	Temp. (°C)	15.2	15.4	15.4	16.0	16.3	15.7	15.5	16.0	14.9	15.3	15.4
	Salinity (ppt)	31.8	32.0	32.0	-	32.2	-	32.2	-	32.2	-	32.6
	pH (units)	7.64	7.76	7.78	-	7.86	-	7.55	-	7.66	-	7.82
	DO (mg/L)	8.1	8.0	7.6	7.9	7.8	7.7	7.9	7.7	8.0	7.9	8.1
B23- 12114	Temp. (°C)	15.5	15.5	15.3	15.6	15.5	15.6	15.3	15.9	14.9	15.4	15.4
	Salinity (ppt)	31.9	32.0	32.2	-	32.2	-	32.3	-	32.6	-	32.7
	pH (units)	7.62	7.76	7.77	-	7.78	-	7.57	-	7.62	-	7.84
	DO (mg/L)	7.9	8.1	7.8	8.0	7.9	7.8	8.0	7.6	8.0	8.0	8.1

Tech Initials (Initial): KYB KYB LK KYB JF RV HK HK MK/JF MK/PY JF

Date Animals Received: 8/31/23

Age or Size of Animals: 3-5mm

Comments:

QC Check: MK 12/21/23

Final Review: *[Signature]*

Water Quality for 10day Amphipod Test

Client: WSP

Project ID: RHMP #5

Test No. 23-09-037 to -046

Test Species: *E. estuarius*

Start Date/Time: 9/12/2023 1030

End Date/Time: 9/22/2023 1030

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
B23-12115	Temp. (°C)	15.3	15.0	14.7	15.5	15.5	15.1	15.2	16.0	14.7	15.4	15.4
	Salinity (ppt)	32.0	31.9 ^{32.0}	32.1	-	31.7	-	33.4	-	33.4	-	33.4
	pH (units)	7.67	7.77	7.80	-	7.86	-	7.73	-	7.73	-	8.01
	DO (mg/L)	8.0	8.1	7.6	7.9	7.8	7.9	8.0	7.5	8.05 ^{8.1}	7.9	8.0
B23-12009	Temp. (°C)	15.3	15.1	16.0	15.2	15.3	14.9	15.2	15.4	14.9	15.1	15.0
	Salinity (ppt)	31.9	32.0	32.0	-	32.5	-	32.7	-	33.5	-	33.9
	pH (units)	7.66	7.66	7.74	-	7.82	-	7.60	-	7.65	-	7.86
	DO (mg/L)	8.2	7.7	7.3	7.9	8.0	8.0	7.9	7.8	8.12 ^{8.1}	8.1	8.1
B23-12010	Temp. (°C)	15.3	15.0	15.3	15.6	15.5	15.0	15.2	15.7	14.9	15.2	14.9
	Salinity (ppt)	31.8	31.9	31.9	-	32.3	-	32.5	-	32.9	-	33.0
	pH (units)	7.64	7.71	7.72	-	7.71	-	7.59	-	7.63	-	7.83
	DO (mg/L)	8.1	8.0	7.9	7.9	7.3	8.0	7.8	7.4	8.18 ^{8.1}	8.1	8.2
B23-12011	Temp. (°C)	15.0	15.0	15.3	15.8	15.9	15.1	15.3	15.4	15.0	15.2	14.9
	Salinity (ppt)	31.8	32.0	31.9	-	32.1	-	32.3	-	32.5	-	32.6
	pH (units)	7.65	7.70	7.71	-	7.73	-	7.54 ^{7.5}	-	7.61	-	7.82
	DO (mg/L)	8.2	7.9	7.4	7.9	7.9	7.9	7.8	7.7	8.0	8.1	8.2
B23-12012	Temp. (°C)	14.8	15.1	14.9	15.8	15.7	15.2	15.3	15.4	15.1	15.2	15.0
	Salinity (ppt)	31.9	32.0	32.0	-	32.1	-	32.1	-	32.9	-	33.1
	pH (units)	7.67	7.69	7.70	-	7.79	-	7.67	-	7.63	-	7.83
	DO (mg/L)	7.7	8.0	7.6	7.9	8.0	7.9	7.8	7.4	8.0	8.1	8.2
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											

Tech Initials (Initial): KYB KYB HK KYB JC RV HK ~~HK~~ MK/JP MK/RV JC

Date Animals Received: 8/31/23

Age or Size of Animals: 3-5mm

Comments:

QC Check: MK 12/21/23

Final Review: *[Signature]*

WSP
RHMP #5 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control	53 28 31 33 18
B23-12117	50 9 14 54 44
B23-12118	42 29 41 6 26
B23-12119	52 25 12 32 39
B23-12120	2 11 30 36 57
B23-12114	13 22 58 8 38

QC Check - Amphipod: AL

WSP
RHMP #5 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12115	34 27 5 10 43
B23-12009	49 1 17 20 59
B23-12010	4 48 7 37 24
B23-12011	51 19 46 60 21
B23-12012	23 3 47 15 45
Grain Size Control	56 40 35 16 55

QC Check - Amphipod: AB

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: E. estuarius

Project ID: RHMP 2023 #5

Start Date: 9/12/2023 1030

Test No.: 23-09-037 to -046

End Date: 9/22/2023 1030

DI Blank: 0.0, 0.0

10 mg/L Ammonia Stock: 9.6, 9.0
(x1.22)

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃)	Notes
Lab Control	0	13	22.00	22.44	
B23-12117	0	14	22.00	22.44	
B23-12118	0	15	22.00	22.44	
B23-12119	0	16	22.00	22.44	
B23-12120	0	17	22.00	22.44	
B23-12114	0	18	22.00	22.44	
B23-12115	0	19	22.00	22.44	
B23-12009	0	20	22.00	22.44	
B23-12010	0	21	22.00	22.44	
B23-12011	0	22	22.00	22.44	
B23-12012	0	23	22.00	22.44	
Grain Size Control	0 0	24	22.00	22.44	
Lab Control	10	25	21	21.22	HK 10/19/23
B23-12117	10	26	21	21.22	
B23-12118	10	27	21	21.22	
B23-12119	10	28	21	21.22	
B23-12120	10	29	21	21.22	
B23-12114	10	30	21	21.22	
B23-12115	10	31	21	21.22	
B23-12009	10	32	21	21.22	
B23-12010	10	33	21	21.22	
B23-12011	10	34	21	21.22	
B23-12012	10	35	1.48	1.81	
Grain Size Control	10	36	21.22	21.22	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N), 1.0

Comments: 2.0

QC Check: MF 12/21/23

Final Review: [Signature]

Ammonia Subsample Analysis - Porewater

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP #5

Start Date: 9/12/2023

Test No.: 23-04-037 to -046

End Date: 9/22/2023

DI Blank: 0.0

10 mg/L Ammonia Stock:

(x 1.22)

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check: MK 12/21/23

Final Review:

Unionized Ammonia Calculation for Pressure of 1 atm															
Input 'Shaded' data															

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Amphipod Batch #6

9/15/23

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP #6 (9.15.23)

Species *Eohaustorius estuarius*

Test No. 23-09-064 to -077

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
Lab Control #1	58	20	20	100	98.0	NA
	22	20	19	95		
	71	20	19	95		
	9	20	20	100		
	74	20	20	100		
B23-12099	45	20	15	75	76.0	77.6
	8	20	12	60		
	55	20	15	75		
	47	20	19	95		
	84	20	15	75		
B23-12103	61	20	14	70	71.0	72.4
	52	20	18	90		
	40	20	11	55		
	19	20	17	85		
	25	20	11	55		
B23-12107	27	20	13	65	70.0	71.4
	44	20	13	65		
	76	20	14	70		
	65	20	12	60		
	17	20	18	90		
B23-12109	46	20	19	95	85.0	86.7
	26	20	15	75		
	5	20	18	90		
	4	20	18	90		
	77	20	15	75		
B23-12110	20	20	17	85	71.0	72.4
	6	20	14	70		
	7	20	11	55		
	50	20	12	60		
	79	20	17	85		
B23-12155	16	20	1	5	5.0	5.1
	56	20	2	10		
	34	20	1	5		
	82	20	1	5		
	49	20	0	0		

Notes: **Bold** indicates statistically significant difference.

Comments:

QC Check: TD (12/17/2023)

Final Review: MSK

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP #6 (9.15.23)

Species *Eohaustorius estuarius*

Test No. 23-09-064 to -077

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
B23-12098	38	20	17	85	71.0	72.4
	53	20	17	85		
	41	20	13	65		
	69	20	11	55		
	2	20	13	65		
B23-12093	63	20	14	70	77.0	78.6
	66	20	17	85		
	70	20	12	60		
	37	20	17	85		
	85	20	17	85		
B23-12095	42	20	16	80	74.0	75.5
	48	20	13	65		
	33	20	16	80		
	68	20	12	60		
	28	20	17	85		
B23-12096	21	20	11	55	61.0	62.2
	14	20	12	60		
	60	20	14	70		
	62	20	12	60		
	11	20	12	60		
B23-12097	78	20	16	80	88.0	89.8
	10	20	19	95		
	30	20	19	95		
	29	20	18	90		
	73	20	16	80		
B23-12102	36	20	15	75	65.0	66.3
	31	20	14	70		
	18	20	10	50		
	15	20	13	65		
	32	20	13	65		
B23-12091	72	20	15	75	78.0	79.6
	54	20	17	85		
	83	20	16	80		
	23	20	16	80		
	57	20	14	70		

Notes: Bold indicates statistically significant difference.

QC Check: TD (12/17/2023)

Final Review: MSK

Amec Foster Wheeler Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP #6 (9.15.23)

Species *Eohaustorius estuarius*

Test No. 23-09-064 to -077

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
B23-12003	35	20	18	90	79.0	80.6
	59	20	14	70		
	43	20	14	70		
	1	20	14	70		
	3	20	19	95		
LC 2	67	20	17	85	91.0	92.9
	64	20	17	85		
	81	20	18	90		
	24	20	19	95		
	13	20	20	100		
Grain Size Control	51	21	21	100	97.0	99.0
	12	20	20	100		
	39	20	20	100		
	80	20	18	90		
	75	20	19	95		

Notes: **Bold** indicates statistically significant difference.

QC Check: TD (12/17/2023)

Final Review: MSK

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column B	B23-12099
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0076
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.859$, $df=4.386$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column B	76.00
17	Difference between means ($B - A$) $\pm$ SEM	-22.00 ± 5.701
18	95% confidence interval	-37.29 to -6.707
19	R squared (eta squared)	0.7725
20		
21	F test to compare variances	
22	F, DFn, Dfd	20.67, 4, 4
23	P value	0.0124
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column C	B23-12103
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0100
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.641$, $df=4.224$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column C	71.00
17	Difference between means (C - A) $\pm$ SEM	-27.00 ± 7.416
18	95% confidence interval	-47.17 to -6.833
19	R squared (eta squared)	0.7583
20		
21	F test to compare variances	
22	F, DFn, Dfd	35.67, 4, 4
23	P value	0.0044
24	P value summary	**
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column D	B23-12107
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0024
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=5.199$, $df=4.435$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column D	70.00
17	Difference between means ($D - A$) $\pm$ SEM	-28.00 ± 5.385
18	95% confidence interval	-42.39 to -13.61
19	R squared (eta squared)	0.8591
20		
21	F test to compare variances	
22	F, DFn, Dfd	18.33, 4, 4
23	P value	0.0155
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column D	5

Final review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column E	B23-12109
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0167
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.982$, $df=4.681$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column E	85.00
17	Difference between means ($E - A$) $\pm$ SEM	-13.00 ± 4.359
18	95% confidence interval	-24.44 to -1.561
19	R squared (eta squared)	0.6552
20		
21	F test to compare variances	
22	F, DFn, Dfd	11.67, 4, 4
23	P value	0.0354
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

Final Review: J2

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column F	B23-12110
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0055
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=4.269$, $df=4.311$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column F	71.00
17	Difference between means ($F - A$) $\pm$ SEM	-27.00 ± 6.325
18	95% confidence interval	-44.07 to -9.929
19	R squared (eta squared)	0.8087
20		
21	F test to compare variances	
22	F, DFn, Dfd	25.67, 4, 4
23	P value	0.0082
24	P value summary	**
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Final Review: IS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column G	B23-12155
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	<0.0001
9	P value summary	****
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=46.50, df=7.529
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column G	5.000
17	Difference between means (G - A) $\pm$ SEM	-93.00 $\pm$ 2.000
18	95% confidence interval	-97.66 to -88.34
19	R squared (eta squared)	0.9965
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.667, 4, 4
23	P value	0.6328
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column H	B23-12098
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0048
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=4.409, df=4.333
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column H	71.00
17	Difference between means (H - A) $\pm$ SEM	-27.00 $\pm$ 6.124
18	95% confidence interval	-43.50 to -10.50
19	R squared (eta squared)	0.8177
20		
21	F test to compare variances	
22	F, DFn, Dfd	24.00, 4, 4
23	P value	0.0093
24	P value summary	**
25	Significantly different (P < 0.05)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column H	5

Fungal Review: 35

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column I	B23-12093
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0067
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.969$, $df=4.451$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column I	77.00
17	Difference between means (I - A) $\pm$ SEM	-21.00 ± 5.292
18	95% confidence interval	-35.12 to -6.878
19	R squared (eta squared)	0.7796
20		
21	F test to compare variances	
22	F, DFn, Dfd	17.67, 4, 4
23	P value	0.0166
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column I	5

Final Review: TS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column J	B23-12095
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0032
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=4.800, df=4.509
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column J	74.00
17	Difference between means (J - A) $\pm$ SEM	-24.00 $\pm$ 5.000
18	95% confidence interval	-37.29 to -10.71
19	R squared (eta squared)	0.8363
20		
21	F test to compare variances	
22	F, DFn, Dfd	15.67, 4, 4
23	P value	0.0207
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column J	5

Final Review: 31

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column K	B23-12096
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	<0.0001
9	P value summary	****
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=13.51, df=5.882
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column K	61.00
17	Difference between means (K - A) $\pm$ SEM	-37.00 $\pm$ 2.739
18	95% confidence interval	-43.73 to -30.27
19	R squared (eta squared)	0.9688
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.000, 4, 4
23	P value	0.2080
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column K	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column L	B23-12097
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0195
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.774$, $df=5.026$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column L	88.00
17	Difference between means (L - A) $\pm$ SEM	-10.00 ± 3.606
18	95% confidence interval	-19.25 to -0.7461
19	R squared (eta squared)	0.6048
20		
21	F test to compare variances	
22	F, DFn, Dfd	7.667, 4, 4
23	P value	0.0737
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column L	5

Final Review: 50

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column M	B23-12102
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0004
9	P value summary	***
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=7.571$, $df=4.681$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column M	65.00
17	Difference between means ($M - A$) $\pm$ SEM	-33.00 ± 4.359
18	95% confidence interval	-44.44 to -21.56
19	R squared (eta squared)	0.9245
20		
21	F test to compare variances	
22	F, DFn, Dfd	11.67, 4, 4
23	P value	0.0354
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column M	5

final Review SS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column N	B23-12091
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0002
9	P value summary	***
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=7.071, df=5.753
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column N	78.00
17	Difference between means ($N - A$) $\pm$ SEM	-20.00 $\pm$ 2.828
18	95% confidence interval	-26.99 to -13.01
19	R squared (eta squared)	0.8968
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.333, 4, 4
23	P value	0.1846
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column N	5

Final Review: 57

Welch's t test Tabular results		
1	Table Analyzed	RHMP #6 9.15.23
2		
3	Column O	B23-12003
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0126
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.333$, $df=4.386$
13		
14	How big is the difference?	
15	Mean of column A	98.00
16	Mean of column O	79.00
17	Difference between means ($O - A$) $\pm$ SEM	-19.00 ± 5.701
18	95% confidence interval	-34.29 to -3.707
19	R squared (eta squared)	0.7169
20		
21	F test to compare variances	
22	F, DFn, Dfd	20.67, 4, 4
23	P value	0.0124
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column O	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	Grain Size/Lab Control
2		
3	Column L	Lab Control #6
4	vs.	vs.
5	Column K	Grain Size #6
6		
7	Unpaired t test with Welch's correction	
8	P value	0.3417
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.4264$, $df=6.630$
13		
14	How big is the difference?	
15	Mean of column K	97.00
16	Mean of column L	98.00
17	Difference between means ($L - K$) $\pm$ SEM	1.000 ± 2.345
18	95% confidence interval	-4.609 to 6.609
19	R squared (eta squared)	0.02669
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.667, 4, 4
23	P value	0.3651
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column K	5
29	Sample size, column L	5

Survival Counts for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 #6

Start Date/Time: 9/15/2023 1030

Test No. 23-09-064 + 0-077

End Date/Time: 9/25/2023 1030

Rand #	Survival Counts		QC Counts
	Start (Day 0)	End (Day 10)	QC (Day 10)
1	20	14	14
2	20	13	
3	20	19	
4	20	18	
5	20	18	
6	20	14	14
7	20	11	
8	20	12	
9	20	20	
10	20	19	
11	20	12	12
12	20	20	
13	20	20	
14	20	12	
15	20	13	
16	20	1	1
17	20	18	
18	20	10	
19	20	17	
20	20	17	
21	20	11	
22	20	19	
23	20	16	
24	20	19	
25	20	10 11	11
26	20	15	15
27	20	13	
28	20	17	
29	20	18	
30	20	19	
31	20	14	14
32	20	13	
33	20	16	
34	20	1	
35	20	18	

Tech Initials:

HK

AG

HK

QC: JFol

RV

AG 090

HK

Ammonia Collected:

Test Start:

Test End:

HK

Comments:

QC Check:

RV 12/21/23

Final Review:

msu

Survival Counts for 10day Amphipod Test

Client: WSP
Project ID: RHMP 2023 #6
Test No. 23-09-064 10-077

Test Species: *E. estuarius*
Start Date/Time: 9/15/2023 1030
End Date/Time: 9/25/2023 1030

Rand #	Survival Counts		QC Counts
	Start (Day 0)	End (Day 10)	QC (Day 10)
36	20	15	15
37	20	17	
38	20	17	
39	20	20	
40	20	11	
41	20	13	13
42	20	16	
43	20	14	
44	20	13	
45	20	15	
46	20	19	
47	20	16	
48	20	13	13
49	20	0	
50	20	12	
51	HK 20 21	20 21	21
52	20	18	
53	20	17	
54	20	17	
55	20	15	
56	20	2	2
57	20	14	
58	20	10 20 MK	
59	20	14	
60	20	14	
61	20	14	14
62	20	12	
63	20	14	
64	20	17	
65	20	12	
66	20	17	17
67	20	17	
68	20	12	
69	20	11	
70	20	12	

Tech Initials: HK HK/MK/JF HK

Ammonia Collected: Test Start: HK Test End: HK

Comments: SURVIVORS: B23-12107: 13 B23-12110: 15 B23-12155 had
B23-12098: 15 B23-12103: 15 16 severe avoidance after 2 hrs

QC Check: RV 12/21/23 Final Review: HK after initiation

Survival Counts for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 #6

Start Date/Time: 9/15/2023

Test No. 23-09-064 to-077

End Date/Time: 9/25/2023

[illegible]

Tech Initials:

QC: JF
d: Test Start: 160301TK

Test End: HL

Ammonia Collected:

Comments:

QC Check: KNM 21/23

Final Review:

Amet-Foster-Wheeler Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

WSP USA E&I

Water Quality for 10day Amphipod Test

Client: WSP

Project ID: RHMP 2023 # 6

Test No. 23-09-064 + 0-077

Test Species: *E. estuarius*

Start Date/Time: 9/15/2023 1030

End Date/Time: 9/25/2023 1030

Sample ID	QC, Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
Lab Control #1	Temp. (°C)	14.7	15.6	15.2	15.4	15.4	14.6	14.9	14.5	15.0	14.5	15.2
	Salinity (ppt)	32.0		31.8		32.0		32.0		32.2		32.6
	pH (units)	7.58		7.56		7.55		7.55		7.58		7.68
	DO (mg/L)	8.0	7.8	7.7	7.3	7.5	8.0	7.7	8.2	7.9	8.2	8.2
B23-12099	Temp. (°C)	14.7	15.6	15.0	14.9	14.7	14.7	14.4	14.5	14.7	14.4	14.7
	Salinity (ppt)	32.1		32.0		32.3		32.4		32.6		32.8
	pH (units)	7.60		7.57		7.58		7.63		7.60		7.74
	DO (mg/L)	8.0	7.9	7.8	7.1	7.6	7.9	7.8	8.2	8.1	8.2	8.2
B23-12103	Temp. (°C)	14.7	15.7	15.1	15.1	15.4	14.4	14.4	14.4	14.6	14.4	14.6
	Salinity (ppt)	32.1		32.1		32.1		32.4		32.8		33.0
	pH (units)	7.63		7.62		7.50		7.63		7.60		7.77
	DO (mg/L)	7.9	8.0	7.9	8.1	7.3	7.9	7.8	8.2	8.1	8.2	8.3
B23-12107	Temp. (°C)	14.8	16.1	15.2	15.0	15.1	14.2	14.3	14.4	14.5	14.4	14.5
	Salinity (ppt)	32.2		32.2		32.2		32.4		32.7		32.8
	pH (units)	7.66		7.65		7.61		7.63		7.63		7.75
	DO (mg/L)	7.9	7.8	7.9	7.8	7.7	8.0	7.9	8.2	8.2	8.2	8.3
B23-12109	Temp. (°C)	14.9	16.4	15.6	14.8	15.6	14.5	15.1	14.7	14.5	14.5	14.6
	Salinity (ppt)	32.1		32.3		32.3		32.4		32.9		32.9
	pH (units)	7.66		7.68		7.63		7.64		7.65		7.77
	DO (mg/L)	7.9	7.6	7.9	8.1	7.7	8.0	8.0	8.2	8.2	8.3	8.4
B23-12110	Temp. (°C)	14.9	16.3	15.6	15.2	15.8	14.7	15.0	14.7	14.8	14.7	15.0
	Salinity (ppt)	32.2		32.4		32.3		32.5		32.9		33.0
	pH (units)	7.69		7.70		7.64		7.64		7.68		7.77
	DO (mg/L)	7.9	7.9	7.9	7.9	7.7	8.0	8.1	8.2	8.2	8.2	8.3
B23-12155	Temp. (°C)	14.9	16.3	15.4	15.1	15.3	14.5	14.7	14.7	14.6	14.7	14.6
	Salinity (ppt)	32.2		32.2		32.1		32.3		32.7		32.9
	pH (units)	7.71		7.81		7.80		7.89		7.84		8.26
	DO (mg/L)	7.8	7.8	7.8	7.9	7.7	7.9	8.0	8.1	8.1	8.2	8.2

Tech Initials (Initial):

RJ JF RV RV MK MK JF SC JF MK

Date Animals Received: 9/17/23

Age or Size of Animals: 3-5 mm

Comments:

QC Check:

RJ 12/21/23

Final Review:

msu

Water Quality for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 # 6

Start Date/Time: 9/15/2023 1030

Test No. 23-09-064 10-077

End Date/Time: 9/25/2023 1030

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
B23-12098	Temp. (°C)	15.0	15.8	15.3	15.2	15.1	14.3	14.4	14.5	14.2	14.4	14.7
	Salinity (ppt)	32.2		32.4		32.3		32.5		32.9		32.9
	pH (units)	7.65		7.65		7.60		7.73		7.69		7.82
	DO (mg/L)	7.9	7.9	7.9	7.9	7.7	8.2	8.2	8.1	8.1	8.2	8.7
B23-12093	Temp. (°C)	14.8	15.9	15.1	15.1	15.4	14.5	14.4	14.3	14.2	14.2	14.6
	Salinity (ppt)	32.2		32.3		32.3		32.4		32.8		32.9
	pH (units)	7.68		7.69		7.62		7.71		7.70		7.83
	DO (mg/L)	7.9	7.9	8.0	8.1	7.9	8.1	8.2	8.2	8.2	8.3	8.53
B23-12095	Temp. (°C)	14.9	15.7	15.4	15.3	15.1	14.4	14.5	14.4	14.1	14.2	14.3
	Salinity (ppt)	32.2		32.4		32.4		32.6		33.0		33.2
	pH (units)	7.68		7.69		7.63		7.70		7.69		7.73
	DO (mg/L)	7.9	8.0	8.0	7.8	7.7	8.1	8.2	8.1	8.3	8.3	8.5
B23-12096	Temp. (°C)	14.8	15.5	15.0	15.2	15.0	14.6	14.7	14.6	14.1	14.1	14.3
	Salinity (ppt)	32.3		32.5		32.4		32.6		33.0		33.1
	pH (units)	7.60		7.69		7.68		7.67		7.69		7.72
	DO (mg/L)	7.9	8.0	8.0	8.0	7.9	8.1	8.2	8.2	8.3	8.3	8.6
B23-12097	Temp. (°C)	14.5	15.5	15.0	15.4	15.2	14.6	14.7	14.6	14.3	14.2	14.1
	Salinity (ppt)	32.3		32.5		32.6		32.7		33.1		33.2
	pH (units)	7.69		7.70		7.64		7.64		7.70		7.76
	DO (mg/L)	8.0	8.0	8.0	7.8	7.8	8.1	8.2	8.1	8.2	8.2	8.5
B23-12102	Temp. (°C)	14.4	15.8	15.0	15.4	15.0	14.7	14.9	14.9	14.5	14.4	14.6
	Salinity (ppt)	32.3		32.6		33.4		32.8		33.1		33.2
	pH (units)	7.71		7.69		7.66		7.73		7.71		7.79
	DO (mg/L)	8.0	7.9	8.0	8.0	7.8	8.0	8.1	8.0	8.2	8.2	8.3
B23-12091	Temp. (°C)	14.6	15.7	15.2	15.4	15.5	14.9	14.8	14.4	14.5	14.5	14.3
	Salinity (ppt)	32.4		32.6		32.6		32.7		33.0		33.2
	pH (units)	7.69		7.71		7.64		7.72		7.69		7.79
	DO (mg/L)	8.0	8.0	8.0	8.0	7.7	8.0	8.2	8.3	8.1	8.1	8.45
Tech Initials (Initial):		RJ	JF	RV	HK	HK	MK/JF	MK/RJ	TR	SC	TR	MK

Date Animals Received: 9/17/23

Age or Size of Animals: 3-5 mm

Comments:

QC Check: RJ 12/21/23

Final Review: MK

Water Quality for 10day Amphipod Test

Client: WSP

Project ID: RHMP 2023 # 6

Test No. 23-09-06410-071

Test Species: *E. estuarius*

Start Date/Time: 9/15/2023 1030

End Date/Time: 9/25/2023 1030

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
B23-12003	Temp. (°C)	14.7	15.9	15.3	15.6	16.0	15.6	15.4	14.9	14.6	14.5	14.4
	Salinity (ppt)	32.3		32.5		32.3		32.5		32.9		33.1
	pH (units)	7.69		7.72		7.69		7.74		7.72		7.79
	DO (mg/L)	8.0	7.9	8.0	8.0	7.8	7.7	8.1	8.2	8.1	8.1	8.4
Grain Size Control	Temp. (°C)	14.8	15.4	15.9	15.3	16.0	15.0	15.1	15.0	14.8	14.7	14.5
	Salinity (ppt)	32.1		32.5		32.4		32.4		32.9		33.0
	pH (units)	7.67		7.73		7.68		7.68		7.71		7.74
	DO (mg/L)	7.9	7.9	8.0	8.1	7.8	8.0	8.1	8.0	8.0	8.1	8.3
Lab Control # 2	Temp. (°C)	14.7	16.6	15.2	15.9	15.6	15.6	16.0	14.8	14.8	14.7	14.7
	Salinity (ppt)	32.2		32.2		32.2		32.6		33.0		33.0
	pH (units)	7.69		7.70		7.64		7.72		7.70		7.78
	DO (mg/L)	8.0	7.8	8.0	7.9	7.8	7.9	8.0	8.2	8.1	8.1	8.4
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											

Tech Initials (Initial): RV JP RV HK HK MK/R MK/R JP SC JP MK

Date Animals Received: 9/17/23

Age or Size of Animals: 3-5mm

Comments:

QC Check: RV 12/11/23

Final Review: [Signature]

WSP
RHMP #6 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control #1	58 22 71 9 74
B23-12099	45 8 55 47 84
B23-12103	61 52 40 19 25
B23-12107	27 44 76 65 17
B23-12109	46 26 5 4 77
B23-12110	20 6 7 50 79

QC Check - Amphipod: AL

WSP
RHMP #6 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12155	16 56 34 82 49
B23-12098	38 53 41 69 2
B23-12093	63 66 70 37 85
B23-12095	42 48 33 68 28
B23-12096	21 14 60 62 11
B23-12097	78 10 30 29 73

QC Check - Amphipod: AL

WSP
RHMP #6 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12102	36 31 18 15 32
B23-12091	72 54 83 23 57
B23-12003	35 59 43 1 3
Grain Size Control	67 64 81 24 13
Lab Control #2	51 12 39 80 75

QC Check - Amphipod: AL

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Project ID: RHMP 2023 #6

Test No.: 23-09-004 to -077

DI Blank: 0.0

Test Species: *M. galloprovincialis* ^{MR/RV} *E. estuarius*

Start Date: 9/15/2023 1030

End Date: 9/25/2023 1030

10 mg/L Ammonia Stock: 9.15

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃)	Notes
Lab Control #1	0	18	0.20	0.244	11/6/23 MK
B23-12099	0	19	0.20	0.244	
B23-12103	0	20	0.50	0.61	
B23-12107	0	21	0.40	0.488	
B23-12109	0	22	0.50	0.61	
B23-12110	0	23	0.50	0.61	
B23-12155	0	24	2.30	2.81	
B23-12098	0	25	0.30	0.366	
B23-12093	0	26	0.40	0.488	
B23-12095	0	27	0.70	0.854	
B23-12096	0	28	0.40	0.488	
B23-12097	0	29	0.60	0.732	
B23-12102	0	30	0.60	0.732	
B23-12091	0	31	0.40	0.488	
B23-12003	0	32	0.70	0.854	
Grain Size Control	0	33	0.90	1.10	
Lab Control #2	0	34	0.40	0.488	
Lab Control #1	10	35	0.20	0.244	
B23-12099	10	36	0.20	0.244	
B23-12103	10	37	0.20	0.244	
B23-12107	10	38	0.20	0.244	
B23-12109	10	39	0.10	0.122	
B23-12110	10	40	0.30	0.366	
B23-12155	10	41	7.30	0.366 MK	8.91
B23-12098	10	42	0.20	0.244	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N) 0.250 mg/L

Comments: 0.2 mg/L

QC Check: RV 12/21/23

Final Review: *[Signature]*

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Project ID: RHMP 2023 #6

Test No.: 23-09-064 to -077

Test Species: ~~*M. galloprovincialis*~~^{MK} *E. estuarius*

Start Date: 9/15/2023 1030

End Date: 9/25/2023 1030

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.15

(x1.22)

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N) 0.750 mg/L

Comments:

QC Check:

Final Review:

Ammonia Subsample Analysis - Porewater

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 # 6

Start Date: 9/15/2023 1030

Test No.: 23-09-064 to -077

End Date: 9/25/2023 1030

DI Blank: 

10 mg/L Ammonia Stock: 9.0
(x 1.22)

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check:

Final Review:

Unionized Ammonia Calculation for Pressure of 1 atm															
Input 'Shaded' data															

Unionized Ammonia Calculation for Pressure of 1 atm															
Input 'Shaded' data															
</															

Amphipod Batch #7

9/19/23

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP #7 (9.19.23)

Species *Eohaustorius estuarius*

Test No. 23-09-095 to -104

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
Lab Control #1	19	20	19	95	96.0	NA
	11	20	19	95		
	13	20	19	95		
	39	20	20	100		
	32	20	19	95		
Grain Size	9	20	18	90	87.0	90.6
	3	20	17	85		
	33	20	16	80		
	14	20	19	95		
	5	20	17	85		
B23-12089	20	20	18	90	93.0	96.9
	23	20	19	95		
	47	20	19	95		
	46	20	19	95		
	24	20	18	90		
B23-12090	42	20	19	95	94.0	97.9
	0	20	20	100		
	56	20	17	85		
	48	20	18	90		
	29	20	20	100		
B23-12004	22	20	16	80	80.0	83.3
	53	20	16	80		
	34	20	17	85		
	35	20	16	80		
	18	20	15	75		
B23-12045	54	20	18	90	85.0	88.5
	60	20	17	85		
	37	20	17	85		
	26	20	18	90		
	15	20	15	75		
B23-12046	38	20	18	90	83.0	86.5
	2	20	17	85		
	50	20	17	85		
	58	20	14	70		
	57	20	17	85		

Comments: **Bold** indicates statistically significant difference.

QC Check: TD (12/17/2023)

Final Review: MSK

Survival Counts for 10 day Amphipod Test

Client: WSP

Project ID: RHMP #7 (9.19.23)

Species *Eohaustorius estuarius*

Test No. 23-09-095 to -104

Sample ID	Rand #	Survival Counts		% Survival	Mean % Survival	% of Control
		Number Added	Number Alive (Day 10)			
B23-12006	45	20	19	95	85.0	88.5
	51	20	18	90		
	6	20	19	95		
	17	20	15	75		
	36	20	14	70		
B23-12007	28	20	19	95	96.0	100.0
	16	20	20	100		
	41	20	20	100		
	59	20	20	100		
	25	20	17	85		
B23-12008	30	20	19	95	92.0	95.8
	12	20	17	85		
	44	20	18	90		
	55	20	19	95		
	8	20	19	95		
B23-12151	27	20	17	85	88.0	91.7
	21	20	18	90		
	40	20	16	80		
	43	20	17	85		
	49	20	20	100		
B23-12152	52	20	20	100	97.0	101.0
	7	20	19	95		
	31	20	18	90		
	1	20	20	100		
	10	20	20	100		

Comments: **Bold** indicates statistically significant difference.

QC Check: TD (12/17/2023)

Final Review: MSK

Welch's t test Tabular results		
1	Table Analyzed	RHMP #7 9.19.23
2		
3	Column B	B23-12089
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0479
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.897$, $df=7.692$
13		
14	How big is the difference?	
15	Mean of column A	96.00
16	Mean of column B	93.00
17	Difference between means ($B - A$) $\pm$ SEM	-3.000 ± 1.581
18	95% confidence interval	-6.672 to 0.6717
19	R squared (eta squared)	0.3188
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.500, 4, 4
23	P value	0.7040
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Review: SS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #7 9.19.23
2		
3	Column C	B23-12090
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.2727
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=0.6489, df=4.928
13		
14	How big is the difference?	
15	Mean of column A	96.00
16	Mean of column C	94.00
17	Difference between means (C - A) $\pm$ SEM	-2.000 $\pm$ 3.082
18	95% confidence interval	-9.958 to 5.958
19	R squared (eta squared)	0.07871
20		
21	F test to compare variances	
22	F, DFn, Dfd	8.500, 4, 4
23	P value	0.0618
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Final review, Js

Welch's t test Tabular results		
1	Table Analyzed	RHMP #7 9.19.23
2		
3	Column D	B23-12004
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	<0.0001
9	P value summary	****
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=8.552, df=6.759
13		
14	How big is the difference?	
15	Mean of column A	96.00
16	Mean of column D	80.00
17	Difference between means (D - A) $\pm$ SEM	-16.00 $\pm$ 1.871
18	95% confidence interval	-20.46 to -11.54
19	R squared (eta squared)	0.9154
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.500, 4, 4
23	P value	0.3965
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column D	5

Final Review: J1

Welch's t test Tabular results		
1	Table Analyzed	RHMP #7 9.19.23
2		
3	Column E	B23-12045
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0064
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.773$, $df=5.048$
13		
14	How big is the difference?	
15	Mean of column A	96.00
16	Mean of column E	85.00
17	Difference between means ($E - A$) $\pm$ SEM	-11.00 ± 2.915
18	95% confidence interval	-18.47 to -3.527
19	R squared (eta squared)	0.7382
20		
21	F test to compare variances	
22	F, DFn, Dfd	7.500, 4, 4
23	P value	0.0765
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

final Review 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP #7 9.19.23
2		
3	Column F	B23-12046
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0080
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.677$, $df=4.690$
13		
14	How big is the difference?	
15	Mean of column A	96.00
16	Mean of column F	83.00
17	Difference between means ($F - A$) $\pm$ SEM	-13.00 ± 3.536
18	95% confidence interval	-22.27 to -3.728
19	R squared (eta squared)	0.7424
20		
21	F test to compare variances	
22	F, DFn, Dfd	11.50, 4, 4
23	P value	0.0364
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Final Review: IS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #7 9.19.23
2		
3	Column G	B23-12006
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0518
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.060$, $df=4.291$
13		
14	How big is the difference?	
15	Mean of column A	96.00
16	Mean of column G	85.00
17	Difference between means ($G - A$) $\pm$ SEM	-11.00 ± 5.339
18	95% confidence interval	-25.43 to 3.435
19	R squared (eta squared)	0.4974
20		
21	F test to compare variances	
22	F, DFn, Dfd	27.50, 4, 4
23	P value	0.0072
24	P value summary	**
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP #7 9.19.23
2		
3	Column H	B23-12007
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.5000
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=0.000, df=4.928
13		
14	How big is the difference?	
15	Mean of column A	96.00
16	Mean of column H	96.00
17	Difference between means ($H - A$) $\pm$ SEM	0.000 $\pm$ 3.082
18	95% confidence interval	-7.958 to 7.958
19	R squared (eta squared)	0.000
20		
21	F test to compare variances	
22	F, DFn, Dfd	8.500, 4, 4
23	P value	0.0618
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column H	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #7 9.19.23
2		
3	Column I	B23-12008
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0624
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.789$, $df=5.882$
13		
14	How big is the difference?	
15	Mean of column A	96.00
16	Mean of column I	92.00
17	Difference between means (I - A) $\pm$ SEM	-4.000 ± 2.236
18	95% confidence interval	-9.498 to 1.498
19	R squared (eta squared)	0.3523
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.000, 4, 4
23	P value	0.2080
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column I	5

Final Review: IS

Welch's t test Tabular results		
1	Table Analyzed	RHMP #7 9.19.23
2		
3	Column J	B23-12151
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0383
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.263$, $df=4.690$
13		
14	How big is the difference?	
15	Mean of column A	96.00
16	Mean of column J	88.00
17	Difference between means (J - A) $\pm$ SEM	-8.000 ± 3.536
18	95% confidence interval	-17.27 to 1.272
19	R squared (eta squared)	0.5219
20		
21	F test to compare variances	
22	F, DFn, Dfd	11.50, 4, 4
23	P value	0.0364
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column J	5

f.n.g. Review 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP #7 9.19.23
2		
3	Column K	B23-12152
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.3354
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.4472$, $df=5.882$
13		
14	How big is the difference?	
15	Mean of column A	96.00
16	Mean of column K	97.00
17	Difference between means ($K - A$) $\pm$ SEM	1.000 ± 2.236
18	95% confidence interval	-4.498 to 6.498
19	R squared (eta squared)	0.03288
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.000, 4, 4
23	P value	0.2080
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column K	5

P. ng/ Review- 57

Welch's t test Tabular results		
1	Table Analyzed	Grain Size/Lab Control
2		
3	Column N	Lab Control #7
4	vs.	vs.
5	Column M	Grain Size #7
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0103
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=3.286, df=5.202
13		
14	How big is the difference?	
15	Mean of column M	87.00
16	Mean of column N	96.00
17	Difference between means (N - M) $\pm$ SEM	9.000 $\pm$ 2.739
18	95% confidence interval	2.042 to 15.96
19	R squared (eta squared)	0.6749
20		
21	F test to compare variances	
22	F, DFn, Dfd	6.500, 4, 4
23	P value	0.0972
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column M	5
29	Sample size, column N	5

Survival Counts for 10day Amphipod Test

Client: WSP
Project ID: RHMP 2023 #7
Test No. 23-09-095 to 104

Test Species: *E. estuarius*
Start Date/Time: 9/19/2023 1140
End Date/Time: 9/29/2023 1000

Rand #	Survival Counts		QC Counts
	Start (Day 0)	End (Day 10)	QC (Day 10)
1	20	20	20
2	20	17	
3	20	17	
4	20	20	
5	20	17	
6	20	19	19
7	20	19	
8	20	19	
9	20	18	
10	20	20	
11	20	19	19
12	20	17	
13	20	19	
14	20	19	
15	20	15	
16	20	20	20
17	20	15	
18	20	15	
19	20	19	
20	20	18	
21	20	18	18
22	20	16	
23	20	19	
24	20	18	
25	20	17	
26	20	18	18
27	20	17	
28	20	19	
29	20	20	
30	20	19	
31	20	18	18
32	20	19	
33	20	16	
34	20	17	
35	20	16	
Tech Initials: HK AB RV			

Ammonia Collected: QC: OF
Test Start: JF

Test End: AB/MK

Comments:

QC Check: MSK

Final Review: msk

Survival Counts for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP 2023 #7

Start Date/Time: 9/19/2023 1140

Test No. 23-09-095 to 104

End Date/Time: 9/29/2023 1000

	Survival Counts		QC Counts
Rand #	Start (Day 0)	End (Day 10)	QC (Day 10)
36	20	14	14
37	20	17	
38	20	18	
39	20	20	
40	20	16	
41	20	20	20
42	20	19	
43	20	17	
44	20	18	
45	20	19	
46	20	19	19
47	20	19	
48	20	18	
49	20	20	
50	20	17	
51	20	17 18	18
52	20	20	
53	20	16	
54	20	18	
55	20	19	
56	20	17	
57	20	17	
58	20	14	
59	20	20	
60	20	17	17
Tech Initials:	HK	AG	RV

Tech Initials: HN

Test End:

Ammonia Collected:

Comments:

QC Check:

Final Review:

Water Quality for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP #7

Start Date/Time: 9/19/2023 1140

Test No. 23-09-095 to 104

End Date/Time: 9/29/2023 1000

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
Lab Control #1	Temp. (°C)	14.2	14.0	14.4	14.3	14.4	14.2	14.6	15.3	15.5	15.6	15.3
	Salinity (ppt)	32.3	-	32.3	-	32.4	-	32.5	-	32.5	-	31.6
	pH (units)	7.72	-	7.40	-	7.62	-	7.64	-	7.62	-	7.77
	DO (mg/L)	8.0	8.1	7.8	8.0	8.0	8.4	8.5	8.5	8.3	8.2	7.3
Grain Size Control #1	Temp. (°C)	14.2	14.0	14.1	14.6	14.4	14.0	14.2	14.9	15.4	15.2	15.2
	Salinity (ppt)	32.0	-	32.1	-	32.3	-	32.5	-	32.0	-	31.9
	pH (units)	7.70	-	7.52	-	7.61	-	7.77	-	7.74	-	7.86
	DO (mg/L)	8.1	8.1	7.6	8.1	8.2	8.4	8.5	8.5	8.3	8.2	7.4
B23-12089	Temp. (°C)	14.2	14.5	14.1	14.5	14.3	14.0	14.1	14.8	15.2	15.0	14.9
	Salinity (ppt)	32.3	-	32.3	-	32.5	-	32.9	-	32.8	-	32.4
	pH (units)	7.70	-	7.61	-	7.68	-	7.75	-	7.73	-	7.84
	DO (mg/L)	8.1	7.9	8.0	8.2	8.1	8.3	8.6	8.5	8.4	8.2	7.5
B23-12090	Temp. (°C)	14.3	14.1	14.1	14.3	14.2	13.9	14.5	14.7	15.1	15.0	14.8
	Salinity (ppt)	32.1	-	32.1	-	32.4	-	32.5	-	32.7	-	32.0
	pH (units)	7.71	-	7.51	-	7.67	-	7.79	-	7.74	-	7.89
	DO (mg/L)	8.1	8.1	6.8	8.0	8.0	8.3	8.4	8.5	8.3	8.2	7.6
B23-12004	Temp. (°C)	14.4	14.1	14.1	14.2	14.1	14.0	14.6	14.6	14.7	14.9	14.7
	Salinity (ppt)	32.2	-	32.3	-	32.4	-	32.7	-	32.8	-	32.2
	pH (units)	7.71	-	7.52	-	7.67	-	7.75	-	7.75	-	7.83
	DO (mg/L)	7.9	8.0	7.8	8.1	8.1	8.3	8.4	8.5	8.4	8.2	7.6
B23-12045	Temp. (°C)	14.3	14.0	14.3	14.1	14.0	14.0	14.6	14.5	14.9	14.8	14.5
	Salinity (ppt)	32.2	-	32.2	-	32.5	-	32.6	-	32.7	-	32.3
	pH (units)	7.74	-	7.51	-	7.68	-	7.71	-	7.72	-	7.77
	DO (mg/L)	8.1	8.2	7.6	8.2	8.2	8.3	8.4	8.6	8.4	8.2	7.8
B23-12046	Temp. (°C)	14.3	14.4	14.0	14.0	14.0	14.0	14.3	14.5	14.9	14.8	14.5
	Salinity (ppt)	32.3	-	32.4	-	32.6	-	32.8	-	32.7	-	32.1
	pH (units)	7.76	-	7.64	-	7.69	-	7.75	-	7.77	-	7.85
	DO (mg/L)	8.1	7.9	8.0	8.2	8.1	8.2	8.5	8.5	8.5	8.2	7.9

Tech Initials (Initial):

MK MK/TF MK/RV TF SC TP MK MK AB AB HV

Date Animals Received: 9/17/23

Age or Size of Animals: 3-5mm

Comments:

QC Check: msk

Final Review: msk

Water Quality for 10day Amphipod Test

Client: WSP

Test Species: *E. estuarius*

Project ID: RHMP #7

Start Date/Time: 9/19/2023 1140

Test No. 23-09-095 to 104

End Date/Time: 9/29/2023 1000

Sample ID	Water Quality Measurements (Day)											
	Parameter	0	1	2	3	4	5	6	7	8	9	10
B23-12006	Temp. (°C)	14.2	14.8	14.7	14.6	14.5	13.9	14.2	14.7	14.6	14.7	14.8
	Salinity (ppt)	32.3	-	32.3	-	32.6	-	33.3	-	32.8	-	32.3
	pH (units)	7.71	-	7.66	-	7.69	-	7.71	-	7.80	-	7.80
	DO (mg/L)	7.9	8.2	8.2	8.0	8.1	8.1	8.5	8.5	8.5	8.3	7.7
B23-12007	Temp. (°C)	14.4	14.2	14.1	14.1	14.4	14.0	14.2	14.6	14.7	14.6	15.3
	Salinity (ppt)	32.4	-	32.8	-	32.8	-	33.0	-	33.0	-	32.2
	pH (units)	7.75	-	7.67	-	7.70	-	7.76	-	7.80	-	7.83
	DO (mg/L)	8.0	8.2	8.3	8.2	8.2	8.3	8.6	8.7	8.5	8.0	7.7
B23-12008	Temp. (°C)	14.6	14.2	14.2	13.9	14.2	14.1	14.1	14.4	14.5	14.6	14.8
	Salinity (ppt)	32.0	-	32.0	-	32.4	-	32.5	-	32.5	-	31.6
	pH (units)	7.66	-	7.68	-	7.69	-	7.78	-	7.81	-	7.83
	DO (mg/L)	8.0	8.2	8.3	8.3	8.2	8.3	8.6	8.7	8.5	8.3	7.9
B23-120151 RV	Temp. (°C)	14.6	14.2	-	-	-	-	-	-	-	-	-
	Salinity (ppt)	32.3	-	-	-	-	-	-	-	-	-	-
	pH (units)	7.79	-	-	-	-	-	-	-	-	-	-
	DO (mg/L)	8.0	8.2	-	-	-	-	-	-	-	-	-
B23-12151	Temp. (°C)	14.4	14.2	14.2	14.0	14.1	14.0	14.2	14.4	14.5	14.4	14.7
	Salinity (ppt)	32.3	-	32.6	-	32.8	-	33.1	-	33.0	-	32.3
	pH (units)	7.75	-	7.67	-	7.70	-	7.76	-	7.75	-	7.79
	DO (mg/L)	8.1	8.2	8.3	8.3	8.3	8.3	8.5	8.6	8.5	8.2	7.9
B23-12152	Temp. (°C)	14.6	14.7	14.4	14.0	14.1	14.1	14.4	14.4	14.5	14.5	14.3
	Salinity (ppt)	32.0	-	32.2	-	32.5	-	32.5	-	32.5	-	31.9
	pH (units)	7.75	-	7.67	-	7.69	-	7.74	-	7.78	-	7.84
	DO (mg/L)	8.0	7.9	8.3	8.3	8.2	8.2	8.4	8.6	8.5	8.2	8.1
	Temp. (°C)											
	Salinity (ppt)											
	pH (units)											
	DO (mg/L)											

Tech Initials (Initial): HK MK JR MK/RV JR SC JR MK MK AG AG HK

Date Animals Received: 9/17/23

Age or Size of Animals: 3-5 mm

Comments:

QC Check: mm

Final Review: mm

WSP
RHMP #7 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control #1	19 11 13 39 32
Grain Size Control #1	9 3 33 14 5
B23-12089	20 23 47 46 24
B23-12090	42 4 56 48 29
B23-12004	22 53 34 35 18
B23-12045	54 60 37 26 15

QC Check - Amphipod: AB

#7 WSP
 RHMP #5 Sediment Testing
 Random Numbers

SAMPLE ID	Rand#
¹²⁰⁴⁶ B23-046	38 2 50 58 57
B23-12006	45 51 6 17 36
B23-12007	28 16 41 59 25
B23-12008	30 12 44 55 8
B23-12151	27 21 40 43 49
B23- 12152	52 7 31 1 10

QC Check - Amphipod: AB

overlying Water Ammonia Subsample Analysis - Porewater

Client: WSP
Project ID: RHMP #7
Test No.: 23-09-095 to 104

Test Species: E. estuarius
Start Date: 9/19/2023 1140
End Date: 9/29/2023 1000

DI Blank: 0.0

10 mg/L Ammonia Stock: 8.78

(x 1.22)

Sample ID	Test Day	Vial #	pH (units)	Salinity (ppt)	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃)	Notes
Lab Control	0	25			7.0 ^{<1.00} MK	<1.22	MK
Grain Size Control	0	26			1.5	1.83	
B23- 12089	0	27			0.8 ^{<1.00} MK	<1.22	
B23- 12090	0	28			1.8	2.20	
B23- 12004	0	29			1.1	1.34	
B23- 12045	0	30			1.0	1.22	
B23- 12046	0	31			1.2	1.46	
B23- 12006	0	32			0.4 ^{<1.00} MK	<1.22	
B23- 12007	0	33			1.2	1.46	
B23- 12008	0	34			1.8	2.20	
B23- 12151	0	35			1.5	1.83	
B23- 12152	0	36			1.1	1.34	
Lab Control	10	37			0.6 ^{<1.00} MK	<1.22	
Grain Size Control	10	38			2.9	3.42	
B23- 12089	10	39			0.2 ^{<1.00} MK	<1.22	
B23- 12090	10	40			2.3	2.81	
B23- 12004	10	41			1.3	1.59	
B23- 12045	10	42			0.7 ^{<1.00} MK	<1.22	
B23- 12046	10	43			0.8 ^{<1.00} MK	<1.22	
B23- 12006	10	44			0.3 ^{<1.00} MK	<1.22	
B23- 12007	10	45			0.8 ^{<1.00} MK	<1.22	
B23- 12008	10	46			1.1	1.34	
B23- 12151	10	47			0.2 ^{<1.00} MK	<1.22	
B23- 12152	10	48			0.8 ^{<1.00} MK	<1.22	

Note: The meter detection limit for ammonia is 0.4-mg/L (as N)

Comments: 1-12

QC Check: mm

Final Review: mm

Ammonia Subsample Analysis - Porewater

Client: WSP
Project ID: RHMP #7
Test No.: 23-09-095 to 104

Test Species: *E. estuarius*

Start Date: 9/19/2023 1140

End Date: 9/29/2023 1000

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.8

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check:

Final Review:

Unionized Ammonia Calculation for Pressure of 1 atm																
Input 'Shaded' data																

							Unionized Ammonia Calculation for Pressure of 1 atm													
							Input 'Shaded' data													
								I	pK											
								1	9.26											
								2	9.27											
								3	9.28											
								4	9.29											
								5	9.30											
								6	9.32											
								7	9.33											
								8	9.34											
Eoh RHMP #7 Porewater								Total Ammonia (mg/L)			Temp (C)	Salinity (ppt)	pH	Temp (K)	I	I Rounded	pK	Unionized Ammonia	D.O. (mg/L)	
	Log Number	vial	Day	Dilution																
	Lab Control	13	0	-88				1.586	14.2	32.5	7.45	287.36	7.20	1	9.26	0.011				
	Grain Size	14	0	-88				10.004	14.2	31.9	7.24	287.36	7.07	1	9.26	0.043				
	B23-12089	15	0	-88				4.636	14.2	32.0	7.36	287.36	7.09	1	9.26	0.026				
	B23-12090	16	0	-88				14.518	14.3	31.2	7.61	287.46	6.92	1	9.26	0.147				
	B23-12004	17	0	-88				4.270	14.4	32.7	7.25	287.56	7.24	1	9.26	0.019				
	B23-12045	18	0	-88				3.538	14.3	32.0	7.61	287.46	7.09	1	9.26	0.036				
	B23-12046	19	0	-88				5.978	14.3	32.1	7.40	287.46	7.11	1	9.26	0.037				
	B23-12006	20	0	-88				5.124	14.2	32.2	7.42	287.36	7.13	1	9.26	0.033				
	B23-12007	21	0	-88				9.272	14.4	31.3	7.60	287.56	6.94	1	9.26	0.092				
	B23-12008	22	0	-88				8.174	14.6	31.3	7.45	287.76	6.94	1	9.26	0.059				
	B23-12151	23	0	-88				5.002	14.4	32.1	7.48	287.56	7.11	1	9.26	0.038				
B23-12152	24	0	-88				5.490	14.6	31.3	7.68	287.76	6.94	1	9.26	0.066					
Data Check: NJ																				
QC: RV																				

2023 RHMP DRAFT Sediment Quality Objectives (SQO) Assessment
Toxicity - Amphipod 10-Day Test

Harbor	Strata	Station ID	Control % Survival					Sample % Survival					Mean Control % Survival	Mean Sample % Survival	% of control	Significant?
			A	B	C	D	E	A	B	C	D	E				
Dana Point Harbor	Marina	B23-12063	100	95	100	100	100	100	95	95	90	95	99	95	96.0	Yes
	Deep	B23-12064	100	95	100	100	100	100	100	90	90	100	99	96	97.0	No
	Marina	B23-12065	100	95	100	100	100	95	90	95	100	95	99	95	96.0	Yes
	Marina	B23-12066	100	95	100	100	100	85	100	100	100	95	99	96	97.0	No
Oceanside Harbor	Marina	B23-12059	100	95	100	100	100	100	95	100	95	95	99	97	98.0	No
	Deep	B23-12060	100	95	100	100	100	80	90	85	90	85	99	86	88.9	Yes
	FW-Influenced	B23-12061	100	95	100	100	100	85	75	95	95	100	99	90	90.9	No
	Marina	B23-12062	100	95	100	100	100	80	95	95	85	100	99	91	91.9	Yes
Mission Bay	Deep	B23-12022	90	100	100	100	95	85	95	90	95	100	97	83	95.9	No
	Shallow	B23-12023	90	100	100	100	95	90	95	75	95	90	97	89	91.8	No
	Shallow	B23-12024	90	100	100	100	95	80	85	90	80	90	97	85	87.6	Yes
	FW-Influenced	B23-12025	90	100	100	100	95	90	90	90	95	75	97	86	88.7	Yes
	FW-Influenced	B23-12026	90	100	100	100	95	80	85	90	85	70	97	82	84.5	Yes
	Deep	B23-12055	90	100	100	100	95	80	75	100	100	95	97	90	92.8	No
	Marina	B23-12056	90	100	100	100	95	95	95	80	95	90	97	91	93.8	No
	Marina	B23-12057	90	100	100	100	95	95	90	95	85	85	97	90	92.8	Yes
	Shallow	B23-12058	90	100	100	100	95	100	85	85	95	95	97	92	94.8	No
	Deep	B23-12014	95	100	100	100	95	100	100	100	95	100	98	99	101.0	No
San Diego Bay - North	Deep	B23-12019	95	100	100	100	95	100	85	85	100	95	98	93	94.9	No
	Deep	B23-12020	95	100	100	100	95	95	95	100	90	95	98	95	96.9	No
	Deep	B23-12021	95	100	100	100	95	95	100	90	95	90	98	94	95.9	No
	Marina	B23-12047	95	100	100	100	95	60	85	70	80	80	98	75	76.5	Yes
	Marina	B23-12048	95	100	100	100	95	95	95	90	70	95	98	89	90.8	No
	Marina	B23-12049	95	100	100	100	95	90	100	90	85	95	98	92	93.9	Yes
	Marina	B23-12050	95	100	100	100	95	85	90	90	90	85	98	88	89.8	Yes
	Marina	B23-12051	95	100	100	100	95	90	85	85	85	95	98	88	89.8	Yes
	Shallow	B23-12052	95	100	100	100	95	85	100	100	100	85	98	94	95.9	No
	Marina	B23-12053	95	100	100	100	95	95	90	95	80	85	98	89	90.8	Yes
	Shallow	B23-12054	95	100	100	100	95	95	95	90	95	95	98	94	95.9	Yes
	Deep	B23-12116	95	100	100	100	95	100	100	90	95	85	98	94	95.9	No
	Deep	B23-12117	100	95	95	95	100	90	100	80	100	95	97	93	95.9	No
	Industrial/Port	B23-12118	100	95	95	95	100	95	90	85	95	70	97	87	89.7	Yes
	Industrial/Port	B23-12119	100	95	95	95	100	95	75	90	95	90	97	89	91.8	Yes
	Industrial/Port	B23-12120	100	95	95	95	100	90	75	90	75	80	97	82	84.5	Yes
	Shallow	B23-12121	95	100	100	100	95	100	95	100	100	90	98	97	99.0	No
	Deep	B23-12122	95	100	100	100	95	95	100	95	95	95	98	96	98.0	No
	Shallow	B23-12123	95	100	100	100	95	85	95	90	90	90	98	90	91.8	Yes
	Deep	B23-12124	95	100	100	100	95	90	95	85	90	85	98	89	90.8	Yes
	Marina	B23-12841	95	100	100	100	95	95	85	100	90	95	97	93	94.9	No
	Shallow	B23-12009	100	95	95	95	100	85	95	95	90	90	97	91	93.8	Yes
	Shallow	B23-12010	100	95	95	95	100	90	80	80	90	90	97	86	88.7	Yes
	Shallow	B23-12011	100	95	95	95	100	95	85	80	90	95	97	89	91.8	Yes
	Deep	B23-12012	100	95	95	95	100	95	100	100	100	100	97	99	102.1	No
	Deep	B23-12089	95	95	95	100	95	90	95	95	95	90	96	93	96.9	Yes
	Industrial/Port	B23-12090	95	95	95	100	95	95	100	85	90	100	96	94	97.9	No
	Industrial/Port	B23-12091	100	95	95	100	100	75	85	80	80	70	98	78	79.6	Yes
	Industrial/Port	B23-12093	100	95	95	100	100	70	85	60	85	85	98	77	78.6	Yes
	Industrial/Port	B23-12095	100	95	95	100	100	80	65	80	60	85	98	74	75.5	Yes
	Industrial/Port	B23-12096	100	95	95	100	100	55	60	70	60	60	98	61	62.2	Yes
	Industrial/Port	B23-12097	100	95	95	100	100	80	95	95	90	80	98	88	89.8	Yes
	Industrial/Port	B23-12098	100	95	95	100	100	85	85	65	55	65	98	71	72.4	Yes
	Industrial/Port	B23-12099	100	95	95	100	100	75	60	75	95	75	98	76	77.6	Yes
	FW-Influenced	B23-12102	100	95	95	100	100	75	70	50	65	65	98	65	66.3	Yes
	Industrial/Port	B23-12103	100	95	95	100	100	70	90	55	85	55	98	71	72.4	Yes
	Industrial/Port	B23-12107	100	95	95	100	100	65	65	70	60	90	98	70	71.4	Yes
	FW-Influenced	B23-12109	100	95	95	100	100	95	75	90	90	75	98	85	86.7	Yes
	FW-Influenced	B23-12110	100	95	95	100	100	85	70	55	60	85	98	71	72.4	Yes
	Industrial/Port	B23-12114	100	95	95	95	100	85	80	80	80	80	97	81	83.5	Yes
	Industrial/Port	B23-12115	100	95	95	95	100	60	85	60	70	60	97	67	69.1	Yes
	FW-Influenced	B23-12155	100	95	95	100	100	5	10	5	5	0	98	5	5.1	Yes
San Diego Bay - South	Shallow	B23-12000	100	95	100	100	100	95	95	100	100	90	99	96	97.0	No
	Shallow	B23-12001	100	95	100	100	100	90	95	100	95	100	99	96	97.0	No
	Shallow	B23-12002	100	95	100	100	100	75	90	85	100	95	99	89	89.9	Yes
	Shallow	B23-12003	100	95	95	100	100	90	70	70	70	95	98	79	80.6	Yes
	Deep	B23-12004	95	95	95	100	95	80	80	85	80	75	96	80	83.3	Yes
	FW-Influenced	B23-12005	100	95	100	100	100	100	85	95	95	90	99	93	93.9	Yes
	FW-Influenced	B23-12006	95	95	95	100	95	95	90	95	75	70	96	85	88.5	No
	FW-Influenced	B23-12007	95	95	95	100	95	95	100	100	100	85	96	96	100.0	No
	FW-Influenced	B23-12008	95	95	95	100	95	95	85	90	95	95	96	92	95.8	No
	Shallow	B23-12045	95	95	95	100	95	90	85	85	90	75	96	85	88.5	Yes
	Marina	B23-12046	95	95	95	100	95	90	85	85	70	85	96	83	86.5	Yes
	FW-Influenced	B23-12148	100	95	100	100	100	90	80	85	75	75	99	81	81.8	Yes
	FW-Influenced	B23-12150	100	95	100	100	100	100	95	100	95	95	99	97	98.0	No
	FW-Influenced	B23-12151	95	95	95	100	95	85	90	80	85	100	96	88	91.7	Yes
	FW-Influenced	B23-12152	95	95	95	100	95	100	95	90	100	100	96	97	101.0	No

Data QC'd: JF 12/21/23

Significant Data Entry: JF 1/12/24

APPENDIX C

Statistical Analyses and Raw Data Packages for *Mytilus* Sediment- Water Interface

Bivalve Batch #1

8/16/23

48hr Bivalve Development Results

Client: WSP

Project ID: RHMP #1 - SDB-So Shallow (8/16/23)

Species *Mytilus galloprovincialis*

Test No. 23-08-036 to 23-08-041

Sample ID	Rand #	# Initial Embryos	# Counted	# Normal	Combined % Normal-Alive	Mean Combined % Normal-Alive
Lab Control	27	270	265	240	88.9	89.3
	25	270	262	246	91.1	
	4	270	251	235	87.0	
	18	270	260	246	91.1	
	6	270	255	239	88.5	
B23-12000	12	270	263	243	90.0	87.0
	16	270	246	231	85.6	
	10	270	260	240	88.9	
	2	270	256	238	88.1	
	5	270	241	223	82.6	
B23-12001	17	270	255	239	88.5	86.5
	14	270	231	218	80.7	
	31	270	242	226	83.7	
	3	270	256	242	89.6	
	26	270	258	243	90.0	
B23-12002	7	272	272	256	94.1	87.6
	1	270	244	227	84.1	
	33	270	246	229	84.8	
	8	270	248	233	86.3	
	32	270	255	239	88.5	
B23-12148	9	270	251	232	85.9	82.5
	23	270	239	219	81.1	
	34	270	234	220	81.5	
	24	270	245	226	83.7	
	29	270	236	217	80.4	
B23-12005	15	270	248	233	86.3	86.3
	13	270	244	223	82.6	
	11	270	250	233	86.3	
	30	277	277	259	93.5	
	28	270	243	224	83.0	
B23-12150	22	279	279	262	93.9	88.2
	20	270	246	224	83.0	
	21	270	245	225	83.3	
	19	270	265	242	89.6	
	35	270	259	246	91.1	

Notes: Bold indicates statistically significant difference

Data Entered: AG 12/1/23

QC Check: MK 12/19/23

Final Review: AB 12/26/23

WSP Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

Welch's t test Tabular results		
1	Table Analyzed	RHMP 1 8.16.23 Mussels
2		
3	Column B	B23-12000
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0932
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.476$, $df=6.537$
13		
14	How big is the difference?	
15	Mean of column A	89.32
16	Mean of column B	87.04
17	Difference between means ($B - A$) $\pm$ SEM	-2.280 ± 1.544
18	95% confidence interval	-5.985 to 1.425
19	R squared (eta squared)	0.2500
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.795, 4, 4
23	P value	0.3434
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Review: TS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 1 8.16.23 Mussels
2		
3	Column C	B23-12001
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1064
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.411$, $df=5.443$
13		
14	How big is the difference?	
15	Mean of column A	89.32
16	Mean of column C	86.50
17	Difference between means (C - A) $\pm$ SEM	-2.820 ± 1.999
18	95% confidence interval	-7.835 to 2.195
19	R squared (eta squared)	0.2678
20		
21	F test to compare variances	
22	F, DFn, Dfd	5.358, 4, 4
23	P value	0.1329
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Final Review: JY

Welch's t test Tabular results		
1	Table Analyzed	RHMP 1 8.16.23 Mussels
2		
3	Column D	B23-12002
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.2042
9	P value summary	ns
10	Significantly different (P < 0.05)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=0.8947, df=5.495
13		
14	How big is the difference?	
15	Mean of column A	89.32
16	Mean of column D	87.56
17	Difference between means (D - A) $\pm$ SEM	-1.760 $\pm$ 1.967
18	95% confidence interval	-6.683 to 3.163
19	R squared (eta squared)	0.1271
20		
21	F test to compare variances	
22	F, DFn, Dfd	5.158, 4, 4
23	P value	0.1411
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column D	5

Final Review 38

Welch's t test Tabular results		
1	Table Analyzed	RHMP 1 8.16.23 Mussels
2		
3	Column E	B23-12148
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0004
9	P value summary	***
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=5.299, df=7.575
13		
14	How big is the difference?	
15	Mean of column A	89.32
16	Mean of column E	82.52
17	Difference between means (E - A) $\pm$ SEM	-6.800 $\pm$ 1.283
18	95% confidence interval	-9.788 to -3.812
19	R squared (eta squared)	0.7875
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.621, 4, 4
23	P value	0.6514
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

Final Review: IS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 1 8.16.23 Mussels
2		
3	Column F	B23-12005
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1069
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.413$, $df=5.281$
13		
14	How big is the difference?	
15	Mean of column A	89.32
16	Mean of column F	86.34
17	Difference between means ($F - A$) $\pm$ SEM	-2.980 ± 2.109
18	95% confidence interval	-8.316 to 2.356
19	R squared (eta squared)	0.2743
20		
21	F test to compare variances	
22	F, DFn, Dfd	6.080, 4, 4
23	P value	0.1084
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Final Review. JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 1 8.16.23 Mussels
2		
3	Column G	B23-12150
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.3212
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.4933$, $df=5.051$
13		
14	How big is the difference?	
15	Mean of column A	89.32
16	Mean of column G	88.18
17	Difference between means ($G - A$) $\pm$ SEM	-1.139 ± 2.308
18	95% confidence interval	-7.054 to 4.777
19	R squared (eta squared)	0.04596
20		
21	F test to compare variances	
22	F, DFn, Dfd	7.478, 4, 4
23	P value	0.0769
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review 55

Embryo-Larval Development Test

Stock Preparation Worksheet

Test Species: M. galloprovincialis
 Batch ID: RHMP #1 + 230816mgdNH3
 Test Type: MA-SW1

Test Date: 8/16/23
 Analyst: AG

Task	
Spawning Induction	0800
Spawning Begins	0900
# Males/# Females	5/5
Spawn Condition	good
Fertilization Initiated	1130
Fertilization End/Eggs Rinsed	1200/1230
Embryo Counts	1430
Test Initiation	1515

Embryo Density Counts

per 100 µL

Stock #	Stock Volume (mL)	Rep 1	Rep 2	Rep 3	Rep 4	Mean #/100 µL	Mean #/mL (x10)
Stock 1	200	56	54	54	55	54.75	547.5
Stock 2							
Stock 3							

Cell Division:

	% Divided
Stock 1	99
Stock 2	
Stock 3	

Selected Stock:	1
-----------------	---

Stock Density

547.5
500

Dil Factor

(A)

Adjust selected embryo stock to 500 embryos/mL.

Dilution Factor = Stock Density/mL/500

In 10 mL sample volume add 500 µl of 500 embryo/ml stock to obtain 25 embryos/mL in test vials.

Notes:

(A) No Dilution Required

QC = 222/235 = 87%

QA Review:

AG 12/1/23

Final Review: MK 12/20/23

Water Quality for Bivalve Development

Client: WSP

Test Species: *M. galloprovincialis*

Project ID: RHMP 2023 #1

Start Date/Time: 8/16/2023 1515

Test No. 23-08-036 to 23-08-041
AB

End Date/Time: 8/18/2023 1600

Sample ID	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
Lab Control	Temp. (°C)	14.2	15.5 KYB 14.9	14.6
	Salinity (ppt)	30.9	30.9	32.3
	pH (units)	7.59	7.51	7.57
	DO (mg/L)	8.1	8.4	8.1
B23-12000	Temp. (°C)	14.0	14.4	15.2
	Salinity (ppt)	31.8	32.2	32.7
	pH (units)	7.76	7.63	7.79
	DO (mg/L)	8.1	8.3	7.45 KYB
B23-12001	Temp. (°C)	14.1	14.3	14.8
	Salinity (ppt)	31.7	32.4	32.6
	pH (units)	7.67	7.65	7.71
	DO (mg/L)	7.7	8.1	7.8
B23-12002	Temp. (°C)	14.1	14.0	14.7
	Salinity (ppt)	31.6	32.3	32.6
	pH (units)	7.71	7.63	7.77
	DO (mg/L)	8.0	8.3	7.8
B23-12148	Temp. (°C)	13.8	14.0	14.6
	Salinity (ppt)	31.9	32.8	33.2
	pH (units)	7.74	7.64	7.71
	DO (mg/L)	8.1	8.4	7.1
B23-12005	Temp. (°C)	13.7	14.3	14.9
	Salinity (ppt)	31.8	31.9	32.0
	pH (units)	7.81	7.67	7.86
	DO (mg/L)	8.2	8.1	7.8
B23-12150	Temp. (°C)	13.7	13.9	14.8
	Salinity (ppt)	31.6	32.2	32.4
	pH (units)	7.79	7.69	7.88
	DO (mg/L)	8.0	8.2	7.8
Tech Initials:		JF	KYB	KYB

Source of Animals: NWC / Mission Bay

Date Received: 8/24/23
AB

Comments:

QC Check: AB 12/1/23

Final Review: MK 12/20/23

Embryo-Larval Development Test Scoring Worksheet

Client: WSP
Project ID: RHMP 2023 #1
Test No.: 23-08-036 to 23-08-041

Test Species: *M. galloprovincialis*
Start Date: 8/16/2023 1515
End Date: 8/18/2023 1600

Random #	# Counted	# Normal	Tech Initials	Notes
1	244 251	235 227	AG	
2	256	238		
3	256	242		
4	251	235		
5	241	223		
6	255	239		
7	272	256		
8	248	233		
9	251	232		
10	260	240		
11	250	233		
12	263	243		
13	244	223		
14	237	218		Heavy debris
15	248	233		
16	246	231		
17	255	239		
18	260	246		
19	265 242	242		
20	246	224		
21	245	225		
22	279	262		
23	239	219		
24	245	226		
25	262	246		
26	258	243		
27	265	240		
28	243	224		
29	236	217		
30	277	259		
31	242	226		
32	255	239		
33	246	229		
34	234	220		
35	259	246		

QC Check: AG 12/1/23

Final Review: MK 12/20/23

WSP
RHMP #1 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control	27
	25
	4
	18
	6
B23-12000	12
	16
	10
	2
	5
B23-12001	17
	14
	31
	3
	26
B23-12002	7
	1
	33
	8
	32
B23-12148	9
	23
	34
	24
	29
B23-12005	15
	13
	11
	30
	28
B23-12150	22
	20
	21
	19
	35

230/254

QC Check - Mussel: KYB

Ammonia Subsample Analysis - Overlying Water

Client: WSP
 Project ID: RHMP 2023 #1
 Test No.: 23-08-036 to 23-08-041
 DI Blank: 0.00

Test Species: M. galloprovincialis
 Start Date: 8/15/2023 ^{18 HR} 1515
 End Date: 8/17/2023 ^{18 HR} 1600
 10 mg/L Ammonia Stock: 7.97 ^{KyB} 8.20

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃)	Notes
Lab Control	0	41	<2	<2.44	
B23-12000	0	42	<2	4.77 <2.44	
B23-12001	0	43	<2	4.77 <2.44	
B23-12002	0	44	<2	4.77 <2.44	
B23-12148	0	45	<2	3.14 <2.44	
B23-12005	0	46	2.65	3.23	
B23-12150	0	47	2.35	2.87	
Lab Control	2	48	<2	0.48 <2.44	
B23-12000	2	49	2.36	2.88	
B23-12001	2	50	3.35	4.09	
B23-12002	2	51	<2	2.20 <2.44	
B23-12148	2	52	2.07	2.53	
B23-12005	2	53	2.28	2.78	
B23-12150	2	54	4.73	5.77	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments: 2.0

QC Check: AB 12/1/23

Final Review: MK 12/20/23

RHMP Mussels

Unionized Ammonia Calculation for Pressure of 1 atm														
Input 'Shaded' data														

Bivalve Batch #2

8/30/23

48hr Bivalve Development Results

Client: WSP

Project ID: RHMP #2 - Dana Pt., Oceanside, and Mission Bay (8/30/23)

Species *Mytilus galloprovincialis*

Test No. 23-08-061 to 23-08-077

Sample ID	Rand #	# Initial Embryos	# Counted	# Normal	Combined % Normal-Alive	Mean Combined % Normal-Alive	% of Control
Lab Control	20	254	234	224	88.2	92.6	NA
	25	254	242	229	90.2		
	21	260	260	242	93.1		
	66	265	265	254	95.8		
	76	259	259	248	95.8		
B23-12059	86	254	229	224	88.2	90.7	98.0
	48	255	255	242	94.9		
	84	254	229	223	87.8		
	40	254	248	237	93.3		
	16	254	244	227	89.4		
B23-12060	78	254	231	218	85.8	85.6	92.4
	55	254	240	230	90.6		
	83	254	226	214	84.3		
	73	254	232	222	87.4		
	31	254	217	203	79.9		
B23-12061	30	254	218	207	81.5	85.5	92.3
	45	254	239	231	90.9		
	51	254	220	210	82.7		
	50	254	238	227	89.4		
	68	254	219	211	83.1		
B23-12062	58	254	244	232	91.3	88.1	95.1
	37	254	238	229	90.2		
	42	254	211	200	78.7		
	8	254	249	237	93.3		
	89	254	230	221	87.0		
B23-12063	82	254	223	216	85.0	85.4	92.2
	38	254	210	198	78.0		
	90	254	244	236	92.9		
	43	254	223	215	84.6		
	67	254	230	219	86.2		
B23-12064	77	254	237	228	89.8	85.8	92.7
	24	254	225	214	84.3		
	5	254	225	214	84.3		
	18	254	233	223	87.8		
	52	254	219	211	83.1		
B23-12065	85	254	231	220	86.6	83.1	89.7
	36	254	212	199	78.3		
	65	254	220	208	81.9		
	7	254	252	228	89.8		
	56	254	215	200	78.7		
B23-12066	57	254	212	203	79.9	85.1	91.9
	6	254	239	228	89.8		
	74	254	235	223	87.8		
	27	254	237	229	90.2		
	49	254	210	198	78.0		

B23-12022	70	254	230	223	87.8	83.9	90.6
	80	254	207	198	78.0		
	12	254	222	206	81.1		
	69	254	228	219	86.2		
	35	254	231	219	86.2		
B23-12023	23	254	205	193	76.0	80.3	86.7
	14	254	210	199	78.3		
	17	254	227	211	83.1		
	39	254	243	231	90.9		
	41	254	197	186	73.2		
B23-12024	53	254	217	205	80.7	82.2	88.8
	9	254	237	225	88.6		
	44	254	206	197	77.6		
	71	254	218	210	82.7		
	28	254	224	207	81.5		
B23-12025	75	254	218	211	83.1	84.1	90.8
	3	254	254	234	92.1		
	2	254	214	196	77.2		
	33	254	242	231	90.9		
	47	254	204	196	77.2		
B23-12026	61	254	218	211	83.1	81.0	87.5
	34	254	220	209	82.3		
	54	254	214	206	81.1		
	15	254	0	0	*0		
	63	254	205	197	77.6		
B23-12055	59	254	229	221	87.0	75.0	81.0
	46	254	216	206	81.1		
	11	254	147	139	54.7		
	62	254	207	195	76.8		
	13	254	203	192	75.6		
B23-12056	64	254	210	201	79.1	87.1	94.1
	10	262	262	250	95.4		
	22	254	84	75	*29.5		
	60	254	227	219	86.2		
	72	254	229	223	87.8		
B23-12057	79	254	220	214	84.3	83.4	90.0
	88	254	225	217	85.4		
	32	254	211	201	79.1		
	87	254	248	241	94.9		
	19	254	202	186	73.2		
B23-12058	1	254	248	231	90.9	84.2	90.9
	81	254	197	190	74.8		
	4	254	236	221	87.0		
	26	254	74	56	*22.0		
	29	254	227	213	83.9		

Notes: **Bold** indicates statistically significant difference; (*) asterisk indicates replicate considered an outlier using Grubbs outlier test (poor recovery during termination and heavy debris observed)

Data Entered: AG 12/6/23

Data QC: JF 12/20/23

QC Check: JF 12/20/23

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column B	B23-12059
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1940
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.9131$, $df=7.972$
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column B	90.72
17	Difference between means ($B - A$) $\pm$ SEM	-1.900 ± 2.081
18	95% confidence interval	-6.701 to 2.901
19	R squared (eta squared)	0.09468
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.125, 4, 4
23	P value	0.9118
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Review : Js

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column C	B23-12060
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0085
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.017$, $df=7.816$
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column C	85.60
17	Difference between means (C - A) $\pm$ SEM	-7.020 ± 2.327
18	95% confidence interval	-12.41 to -1.632
19	R squared (eta squared)	0.5379
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.362, 4, 4
23	P value	0.7717
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column D	B23-12061
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0105
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.901$, $df=7.582$
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column D	85.52
17	Difference between means ($D - A$) $\pm$ SEM	-7.100 ± 2.448
18	95% confidence interval	-12.80 to -1.401
19	R squared (eta squared)	0.5260
20		
21	F test to compare variances	
22	F, DF _n , DF _d	1.613, 4, 4
23	P value	0.6544
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column D	5

Final Review: 5)

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column E	B23-12062
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0879
9	P value summary	ns
10	Significantly different (P < 0.05)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=1.519, df=6.490
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column E	88.10
17	Difference between means (E - A) $\pm$ SEM	-4.520 $\pm$ 2.976
18	95% confidence interval	-11.67 to 2.630
19	R squared (eta squared)	0.2622
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.863, 4, 4
23	P value	0.3327
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column F	B23-12063
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0185
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.588, df=6.797
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column F	85.34
17	Difference between means (F - A) $\pm$ SEM	-7.280 $\pm$ 2.813
18	95% confidence interval	-13.97 to -0.5874
19	R squared (eta squared)	0.4963
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.452, 4, 4
23	P value	0.4062
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Final Review: 33

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column G	B23-12064
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0047
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.431$, $df=7.745$
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column G	85.86
17	Difference between means ($G - A$) $\pm$ SEM	-6.760 ± 1.970
18	95% confidence interval	-11.33 to -2.191
19	R squared (eta squared)	0.6032
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.443, 4, 4
23	P value	0.7310
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column H	B23-12065
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0048
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=3.528, df=7.012
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column H	83.06
17	Difference between means (H - A) $\pm$ SEM	-9.560 $\pm$ 2.709
18	95% confidence interval	-15.96 to -3.155
19	R squared (eta squared)	0.6397
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.202, 4, 4
23	P value	0.4633
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column H	5

Final Report JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column I	B23-12066
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0218
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.503, df=6.467
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column I	85.14
17	Difference between means (I - A) $\pm$ SEM	-7.480 $\pm$ 2.989
18	95% confidence interval	-14.67 to -0.2924
19	R squared (eta squared)	0.4920
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.897, 4, 4
23	P value	0.3275
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column I	5

Final Review: 31

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column J	B23-12022
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0034
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.665$, $df=7.699$
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column J	83.86
17	Difference between means (J - A) $\pm$ SEM	-8.760 ± 2.390
18	95% confidence interval	-14.31 to -3.210
19	R squared (eta squared)	0.6356
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.493, 4, 4
23	P value	0.7074
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column J	5

Final Review: SS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column K	B23-12023
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0063
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=3.564, df=5.798
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column K	80.30
17	Difference between means (K - A) $\pm$ SEM	-12.32 $\pm$ 3.457
18	95% confidence interval	-20.85 to -3.790
19	R squared (eta squared)	0.6866
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.212, 4, 4
23	P value	0.1926
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column K	5

Final Review SS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column L	B23-12024
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0012
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=4.415, df=7.766
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column L	82.22
17	Difference between means (L - A) $\pm$ SEM	-10.40 $\pm$ 2.355
18	95% confidence interval	-15.86 to -4.940
19	R squared (eta squared)	0.7151
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.420, 4, 4
23	P value	0.7422
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column L	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column M	B23-12025
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0278
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.399, df=5.693
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column M	84.10
17	Difference between means (M - A) $\pm$ SEM	-8.520 $\pm$ 3.552
18	95% confidence interval	-17.33 to 0.2858
19	R squared (eta squared)	0.5027
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.503, 4, 4
23	P value	0.1741
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column M	5

Final Review. 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column N	B23-12026
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0003
9	P value summary	***
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=5.976$, $df=6.960$
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column N	81.03
17	Difference between means ($N - A$) $\pm$ SEM	-11.60 ± 1.940
18	95% confidence interval	-16.19 to -7.002
19	R squared (eta squared)	0.8369
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.946, 4, 3
23	P value	0.6111
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column N	4

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column O	B23-12055
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0149
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=3.101, df=4.611
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column O	75.04
17	Difference between means (O - A) $\pm$ SEM	-17.58 $\pm$ 5.669
18	95% confidence interval	-32.53 to -2.630
19	R squared (eta squared)	0.6759
20		
21	F test to compare variances	
22	F, DFn, Dfd	13.02, 4, 4
23	P value	0.0291
24	P value summary	*
25	Significantly different (P < 0.05)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column O	5

Final Review: TS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column P	B23-12056
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1025
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.497$, $df=4.223$
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column P	87.13
17	Difference between means ($P - A$) $\pm$ SEM	-5.495 ± 3.671
18	95% confidence interval	-15.48 to 4.488
19	R squared (eta squared)	0.3467
20		
21	F test to compare variances	
22	F, DFn, Dfd	3.902, 3, 4
23	P value	0.2214
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column P	4

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column Q	B23-12057
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0304
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.364, df=5.370
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column Q	83.38
17	Difference between means (Q - A) $\pm$ SEM	-9.240 $\pm$ 3.908
18	95% confidence interval	-19.08 to 0.6009
19	R squared (eta squared)	0.5101
20		
21	F test to compare variances	
22	F, DFn, Dfd	5.662, 4, 4
23	P value	0.1217
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column Q	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 2 8.30.23 Mussels
2		
3	Column R	B23-12058
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0421
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.259, df=4.164
13		
14	How big is the difference?	
15	Mean of column A	92.62
16	Mean of column R	84.15
17	Difference between means (R - A) $\pm$ SEM	-8.470 $\pm$ 3.749
18	95% confidence interval	-18.72 to 1.779
19	R squared (eta squared)	0.5507
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.105, 3, 4
23	P value	0.2060
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column R	4

Final Review - IS



Intuitive Software for Science

Detecting outliers with Grubbs' test

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For background information and references, see
<http://www.graphpad.com/www/outlier.htm> and
<http://www.graphpad.com/www/grubbs.htm>

Outliers in Statistical Data (3rd edition), V. Barnett and T. Lewis, Wiley, 1994.

Outliers in Statistical Data (3rd edition), V. Barnett and T. Lewis, Wiley, 1994.

Grubb's test for outliers.

Enter a list of values into the white column, then press **CALCULATE**

Data: $P < 0.05??$

90.94488189
74.80314961
87.00787402
22.04724409
83.85826772

Yes

Descriptive statistics

Mean=	71.73228
SD=	28.40572
N=	5

Grubb's test calculates a P value only for the value furthest from the rest. If the test determines that the value is an outlier, you'll see "Yes" next to that value. Otherwise, you'll see the word "No".

Outliers in Statistical Data (3rd edition), V. Barnett and T. Lewis, Wiley, 1994.

Critical value for Grubb's test. If Z is greater than the tabulated value, then P is less than 0.05

N	CriticalZ 5%
3	1.15
4	1.48
5	1.71
6	1.89
7	2.02
8	2.13
9	2.21
10	2.29
11	2.34
12	2.41
13	2.46
14	2.51
15	2.55
16	2.59
17	2.62
18	2.65
19	2.68
20	2.71
21	2.73
22	2.76
23	2.78
24	2.80
25	2.82
26	2.84
27	2.86
28	2.88
29	2.89
30	2.91
31	2.92
32	2.94
33	2.95
34	2.97
35	2.98
36	2.99
37	3.00
38	3.01
39	3.03
40	3.04
50	3.13
60	3.20
70	3.26
80	3.31
90	3.35
100	3.38
110	3.42
120	3.44
130	3.47
140	3.49

These are two tailed P values.

Water Quality for Bivalve Development

Client: WSP
Project ID: RHMP 2023 #2
Test No. 23-08-061 to 23-08-077

Test Species: *M. galloprovincialis*
Start Date/Time: 8/30/2023 1415
End Date/Time: 9/1/2023 1545

Sample ID	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
Lab Control	Temp. (°C)	14.6	14.3	14.5
	Salinity (ppt)	31.9	32.0	32.2
	pH (units)	7.90 7.60 ^{KYB}	7.57	7.48
	DO (mg/L)	7.9	8.1	8.0
B23-12059	Temp. (°C)	14.6	14.1	14.8
	Salinity (ppt)	31.8	32.2	32.4
	pH (units)	7.63	7.67	7.57
	DO (mg/L)	7.6	8.1	8.1
B23-12060	Temp. (°C)	14.1	14.1	14.8
	Salinity (ppt)	32.1	32.6	32.9
	pH (units)	7.62	7.69	7.59
	DO (mg/L)	7.9	8.1	8.1
B23-12061	Temp. (°C)	14.0	14.0	14.6
	Salinity (ppt)	32.1	32.4	33.0
	pH (units)	7.61	7.68	7.57
	DO (mg/L)	7.9	8.1	8.1
B23-12062	Temp. (°C)	14.0	14.0	14.6
	Salinity (ppt)	32.1	32.3	32.5
	pH (units)	7.62	7.69	7.57
	DO (mg/L)	7.9	8.2	8.1
B23-12063	Temp. (°C)	14.0	14.0	14.7
	Salinity (ppt)	32.3	32.7	33.2
	pH (units)	7.68	7.75	7.68
	DO (mg/L)	8.1	8.2	8.2
B23-12064	Temp. (°C)	14.2	14.1	14.7
	Salinity (ppt)	31.7	32.5	32.9
	pH (units)	7.67	7.74	7.61
	DO (mg/L)	8.0	8.2	8.1
Tech Initials:		KYB	KYB	KYB

Source of Animals: NIWC / Mission Bay

Date Received: 8/29/23

Comments: @turned room temp up

QC Check: AB 12/6/23

Datasheet: RN

Final Review: JF 12/20/23

Water Quality for Bivalve Development

Client: WSP
Project ID: RHMP 2023 #2
Test No. 23-08-061 to 23-08-077

Test Species: *M. galloprovincialis*
Start Date/Time: 8/30/2023 1415
End Date/Time: 9/1/2023 1545

Sample ID	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
B23-12065	Temp. (°C)	14.5	14.5	14.6
	Salinity (ppt)	32.1/3 KYB	32.3	32.6
	pH (units)	7.64	7.65	7.55
	DO (mg/L)	8.1	7.8	8.2
B23-12066	Temp. (°C)	14.3	14.3	14.5
	Salinity (ppt)	32.2	32.5	32.9
	pH (units)	7.64	7.68	7.50
	DO (mg/L)	8.1	8.0	8.2
B23-12022	Temp. (°C)	14.3	14.0	14.5
	Salinity (ppt)	32.3	32.6	33.0
	pH (units)	7.61	7.71	7.57
	DO (mg/L)	8.0	8.1	8.3
B23-12023	Temp. (°C)	14.2	14.0	14.5
	Salinity (ppt)	32.2	32.4	33.0
	pH (units)	7.68	7.84	7.75
	DO (mg/L)	7.9	8.1	8.2
B23-12024	Temp. (°C)	14.4	14.0	14.2
	Salinity (ppt)	32.2	32.6	33.1
	pH (units)	7.60	7.72	7.59
	DO (mg/L)	7.9	8.2	8.3
B23-12025	Temp. (°C)	14.1	14.0	14.5
	Salinity (ppt)	32.2	32.3	32.6
	pH (units)	7.63	7.66	7.65
	DO (mg/L)	7.8	7.9	8.1
B23-12026	Temp. (°C)	14.3	14.0	14.3
	Salinity (ppt)	32.0	32.3	32.8
	pH (units)	7.65	7.78 8.0 KYB	7.77
	DO (mg/L)	7.9	7. KYB 8.0	8.1
Tech Initials:		KYB	KYB	KYB

Source of Animals: NIWL/Mission Bay

Date Received: 8/29/23

Comments:

QC Check: AG 12/6/23

Datasheet: RN

Final Review: JF 12/20/23

Water Quality for Bivalve Development

Client: WSP
Project ID: RHMP 2023 #2
Test No. 23-08-061 to 23-08-077

Test Species: *M. galloprovincialis*
Start Date/Time: 8/30/2023 1415
End Date/Time: 9/1/2023 1545

Sample ID	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
B23-12055	Temp. (°C)	14.0	14.0	14.1
	Salinity (ppt)	32.0	32.5	33.0
	pH (units)	7.59	7.68	7.61
	DO (mg/L)	8.1	8.1	8.1
B23-12056	Temp. (°C)	14.0	14.1	14.5
	Salinity (ppt)	32.0	32.1	32.4
	pH (units)	7.59	7.60	7.56
	DO (mg/L)	7.9	8.0	8.0
B23-12057	Temp. (°C)	14.0	14.1	14.5
	Salinity (ppt)	32.0	32.3	32.6
	pH (units)	7.61	7.59	7.56
	DO (mg/L)	8.0	8.1	8.2
B23-12058	Temp. (°C)	14.0	14.0	14.3
	Salinity (ppt)	32.0	32.5	33.20 KYB
	pH (units)	7.62	7.67	7.69
	DO (mg/L)	7.8	8.2	8.2
	Temp. (°C)			
	Salinity (ppt)			
	pH (units)			
	DO (mg/L)			
	Temp. (°C)			
	Salinity (ppt)			
	pH (units)			
	DO (mg/L)			
	Temp. (°C)			
	Salinity (ppt)			
	pH (units)			
	DO (mg/L)			
Tech Initials:		KYB	KYB	KYB

Source of Animals: NIWC/Mission Bay

Date Received: 8/29/23

Comments:

QC Check: AK 12/6/23 Datasheet: RV Final Review: JF 12/20/23

Embryo-Larval Development Test Scoring Worksheet

Client: WSP
Project ID: RHMP 2023 #2
Test No.: 23-08-061 to 23-08-077

Test Species: *M. galloprovincialis*
Start Date: 8/30/2023 1415
End Date: 9/1/2023 1545

Random #	# Counted	# Normal	Tech Initials	Notes
1	248	231	AG	
2	214	196		
3	254	234		
4	236	221		
5	225	214		
6	239	228		
7	252	228		
8	249	237		
9	237	228		
10	262	250		
11	147	139		Heavy debris
12	222	206		
13	203	192		
14	210	199		Heavy debris
15	0	0		No embryos observed (B)
16	244	227		
(A) 17	227	211		
18	233	223		
19	202	186		Heavy debris
20	234	224		
21	260	240 242		
22	84	75		Extremely heavy debris/poor recovery
23	205	193		Heavy debris
24	225	214		
25	242	229		
26	74	56		Extremely heavy debris/poor recovery
27	237	229		
28	224	207		
29	227	213		
30	218	207		
31	217	203		
32	211	201		
33	242	231		
34	220	209		
35	231	219		
36	212	199		
37	238	229		
38	210	198		
39	243	231		
40	248	237	↓	

QC Check: RB 12/6/23

Final Review: JF 12/20/23

Data Sheet: RV

(A) Turbid during screen tube addition
(B) Exclude from analysis/replicate not terminated properly

Embryo-Larval Development Test Scoring Worksheet

Client: WSP
Project ID: RHMP 2023 #2
Test No.: 23-08-061 to 23-08-077

Test Species: *M. galloprovincialis*
Start Date: 8/30/2023 1415
End Date: 9/1/2023 1545

Random #	# Counted	# Normal	Tech Initials	Notes
41	197	186		
42	211	200		
43	223	215		
④ 44	206	197		
45	239	231		
46	216	206		
47	204	196		
48	255	242		
49	210	198		
50	238 220	210 227		
51	220	210		
52	219	211		
53	217	205		
54	214	206		
55	240	230		
⑥ 56	215	200		swt crystals & fibers observed
57	212	203		
58	244	232		
59	229	221		
60	227	219		
61	218	211		
62	207	195		
63	205	197		
64	210	201		
65	220	208		
66	265	254		
67	230	219		
68	219	211		
69	228	219		
70	230	223		
71	218	210		
72	229	223		
73	232	222		
74	235	223		
75	218	211		
76	259	248		
77	237	228		
78	231	218		
79	220	214		
80	207	198		

QC Check: Ab 12/6/23

Final Review: JF 12/20/23

DataSet: RV

- ④ some embryos potentially lost during termination
- ⑥ vial had no bottom; lost embryos during termination. Recovered from secondary container

Embryo-Larval Development Test Scoring Worksheet

Client: WSP
Project ID: RHMP 2023 #2
Test No.: 23-08-061 to 23-08-077

Test Species: *M. galloprovincialis*
 Start Date: 8/30/2023 1415
 End Date: 9/1/2023 1545

[illegible]

QC Check: AB 12/6/23

Final Review: TF 12/20/23

Datensheet: RN

WSP
RHMP #2 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control	20 25 21 66 76
B23-12059	86 48 84 40 16
B23-12060	78 55 83 73 31
B23-12061	30 45 51 50 68
B23-12062	58 37 42 8 89
B23-12063	82 38 90 43 67
B23-12064	77 24 5 18 52

QC Check - Mussel: RN

WSP
RHMP #2 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12065	85 36 65 7 56
B23-12066	57 6 74 27 49
B23-12022	70 80 12 69 35
B23-12023	23 14 17 39 41
B23-12024	53 9 44 71 28
B23-12025	75 3 2 33 47
B23-12026	61 34 54 15 63

QC Check - Mussel: RV

WSP
RHMP #2 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12055	59
	46
	11
	62
	13
B23-12056	64
	10
	22
	60
	72
B23-12057	79
	88
	32
	87
	19
B23-12058	1
	81
	4
	26
	29

QC Check - Mussel: RV

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: M. galloprovincialis

Project ID: RHMP 2023 #2

Start Date: 8/30/2023 1415

Test No.: 23-08-061 to 23-08-077

End Date: 9/1/2023 1545

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.5

(x1.22)

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃)	Notes
LC	0	1	<2.0	<2.44	
B23-12059	0	2	<2.0	<2.44	
B23-12060	0	3	<2.0	<2.44	
B23-12061	0	4	<2.0	<2.44	
B23-12062	0	5	<2.0	<2.44	
B23-12063	0	6	<2.0	<2.44	
B23-12064	0	7	<2.0	<2.44	
B23-12065	0	8	<2.0	<2.44	
B23-12066	0	9	<2.0	<2.44	
B23-12022	0	10	<2.0	<2.44	
B23-12023	0	11	3.38	4.12	
B23-12024	0	12	<2.0	<2.44	
B23-12025	0	13	<2.0	<2.44	
B23-12026	0	14	2.02	2.46	
B23-12055	0	15	<2.0	<2.44	
B23-12056	0	16	<2.0	<2.44	
B23-12057	0	17	<2.0	<2.44	
B23-12058	0	18	<2.0	<2.44	
LC	2	19	<2.0	<2.44	
B23-12059	2	20	<2.0	<2.44	
B23-12060	2	21	<2.0	<2.44	
B23-12061	2	22	<2.0	<2.44	
B23-12062	2	23	<2.0	<2.44	
B23-12063	2	24	2.48	3.024	
B23-12064	2	25	<2.0	<2.44	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments: 2.0

QC Check: AL 12/14/23

Final Review: JF 12/20/23

Datasheet: RN

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: *M. galloprovincialis*

Project ID: RHMP 2023 #2

Start Date: 8/30/2023 1415

Test No.: 23-08-061 to 23-08-077

End Date: 9/1/2023 1545

DI Blank: 6.0

10 mg/L Ammonia Stock: 9.5

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check:

A6 12/6/23

Final Review:

TF 12/20/22

Worksheet: RN

RHMP Mussels.XLS

Unionized Ammonia Calculation for Pressure of 1 atm																
Input 'Shaded' data																
</																

Bivalve Batch #3

9/06/23

48hr Bivalve Development Results

Client: WSP

Project ID: RHMP #3 - North San Diego Bay

Species *Mytilus galloprovincialis*

Test No. 23-09-019 to 23-09-036

Sample ID	Rand #	# Initial Embryos	# Counted	# Normal	Combined % Normal-Alive	Mean Combined % Normal-Alive	% of Control
Lab Control	63	266	256	250	94.0	88.4	NA
	5	266	241	229	86.1		
	39	266	239	222	83.5		
	62	266	234	223	83.8		
	4	302	302	286	94.7		
B23-12014	10	266	184	173	65.0	80.2	90.7
	51	266	222	197	74.1		
	36	266	257	241	90.6		
	99	266	228	210	78.9		
	1	266	270	246	92.5		
B23-12047	96	266	286	267	93.4	80.8	91.4
	40	266	219	199	74.8		
	87	266	204	185	69.5		
	81	266	244	222	83.5		
	72	266	231	220	82.7		
B23-12116	41	266	227	218	82.0	85.6	96.8
	57	266	257	247	92.9		
	47	293	293	273	93.2		
	73	266	217	204	76.7		
	82	266	233	222	83.5		
B23-12121	93	266	198	178	66.9	73.1	82.7
	80	266	216	200	75.2		
	35	266	193	176	66.2		
	30	266	210	192	72.2		
	20	266	262	226	85.0		
B23-12122	38	266	180	174	65.4	71.0	80.3
	28	266	191	157	59.0		
	52	266	226	219	82.3		
	92	266	200	181	68.0		
	91	266	228	213	80.1		
B23-12048	68	266	233	220	82.7	85.0	96.1
	85	266	249	230	86.5		
	29	297	297	272	91.6		
	48	266	235	221	83.1		
	77	266	228	216	81.2		
B23-12049	97	266	189	184	69.2	72.0	81.5
	46	266	200	193	72.6		
	100	266	179	166	62.4		
	89	266	229	216	81.2		
	78	266	210	199	74.8		
B23-12050	13	266	235	212	79.7	81.2	91.8
	21	266	244	224	84.2		
	75	266	212	202	75.9		
	98	266	233	214	80.5		
	49	266	245	228	85.7		

B23-12051	53	266	201	188	70.7	79.5	90.0
	79	266	245	227	85.3		
	58	266	219	209	78.6		
	66	266	207	198	74.4		
	64	266	249	236	88.7		
B23-12841	24	266	247	228	85.7	78.0	88.3
	61	266	225	207	77.8		
	69	266	213	199	74.8		
	23	266	246	220	82.7		
	18	266	192	184	69.2		
B23-12053	59	266	171	159	59.8	63.4	71.7
	3	266	220	200	75.2		
	16	266	156	143	53.8		
	2	266	213	193	72.6		
	70	266	164	148	55.6		
B23-12054	84	266	230	212	79.7	76.5	86.5
	94	266	236	221	83.1		
	45	266	209	200	75.2		
	22	266	203	182	68.4		
	65	266	246	202	75.9		
B23-12019	37	266	248	236	88.7	79.2	89.6
	34	266	189	175	65.8		
	33	266	197	182	68.4		
	86	266	236	221	83.1		
	9	266	262	240	90.2		
B23-12020	14	266	212	199	74.8	72.8	82.3
	83	266	260	243	91.4		
	90	266	206	187	70.3		
	19	266	180	171	64.3		
	44	266	176	168	63.2		
B23-12021	17	266	227	191	71.8	79.5	89.9
	32	266	239	210	78.9		
	12	266	251	223	83.8		
	25	266	261	235	88.3		
	27	266	226	198	74.4		
B23-12052	26	266	230	210	78.9	82.8	93.7
	95	266	199	190	71.4		
	11	266	251	238	89.5		
	6	266	263	243	91.4		
	50	266	0	0	*0		
B23-12123	67	266	236	222	83.5	81.1	91.8
	76	266	221	204	76.7		
	71	266	207	198	74.4		
	42	266	229	217	81.6		
	8	266	250	238	89.5		
B23-12124	56	266	238	230	86.5	79.9	90.4
	55	266	207	195	73.3		
	54	266	267	257	96.6		
	74	266	207	198	74.4		
	43	266	198	183	68.8		

Notes: **Bold** indicates statistically significant difference; (*) indicates replicate considered an outlier using Grubbs outlier test (poor recovery during termination and heavy debris observed)

Data Entered: JF 12/8/23

Data QC: MK 12/28/23

QC Check: MK 12/28/23

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column B	B23-12014
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1014
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.437$, $df=5.744$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column B	80.22
17	Difference between means (B - A) $\pm$ SEM	-8.200 ± 5.705
18	95% confidence interval	-22.31 to 5.911
19	R squared (eta squared)	0.2645
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.357, 4, 4
23	P value	0.1831
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column C	B23-12047
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0780
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.602$, $df=6.574$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column C	80.78
17	Difference between means (C - A) $\pm$ SEM	-7.640 ± 4.769
18	95% confidence interval	-19.07 to 3.787
19	R squared (eta squared)	0.2808
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.743, 4, 4
23	P value	0.3519
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Final Review: 38

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column D	B23-12116
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.2584
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.6804$, $df=7.488$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column D	85.66
17	Difference between means ($D - A$) $\pm$ SEM	-2.760 ± 4.057
18	95% confidence interval	-12.23 to 6.707
19	R squared (eta squared)	0.05822
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.709, 4, 4
23	P value	0.6165
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column D	5

Final Review 19

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column E	B23-12121
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0039
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.639$, $df=7.281$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column E	73.10
17	Difference between means (E - A) $\pm$ SEM	-15.32 ± 4.209
18	95% confidence interval	-25.20 to -5.444
19	R squared (eta squared)	0.6453
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.917, 4, 4
23	P value	0.5441
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

Final Review: TS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column F	B23-12122
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0065
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=3.436, df=6.249
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column F	70.96
17	Difference between means (F - A) $\pm$ SEM	-17.46 $\pm$ 5.081
18	95% confidence interval	-29.77 to -5.146
19	R squared (eta squared)	0.6539
20		
21	F test to compare variances	
22	F, DFn, Dfd	3.250, 4, 4
23	P value	0.2801
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Final Review: Is

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column G	B23-12048
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1526
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.101$, $df=7.439$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column G	85.02
17	Difference between means ($G - A$) $\pm$ SEM	-3.400 ± 3.088
18	95% confidence interval	-10.61 to 3.814
19	R squared (eta squared)	0.1402
20		
21	F test to compare variances	
22	F, DF _n , DF _d	1.757, 4, 4
23	P value	0.5984
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review: Is

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column H	B23-12049
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0018
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=4.132, df=7.608
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column H	72.04
17	Difference between means (H - A) $\pm$ SEM	-16.38 $\pm$ 3.964
18	95% confidence interval	-25.60 to -7.155
19	R squared (eta squared)	0.6917
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.587, 4, 4
23	P value	0.6655
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column H	5

Final Review: 33

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column I	B23-12050
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0234
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.396$, $df=7.179$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column I	81.20
17	Difference between means (I - A) $\pm$ SEM	-7.220 ± 3.013
18	95% confidence interval	-14.31 to -0.1307
19	R squared (eta squared)	0.4444
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.022, 4, 4
23	P value	0.5119
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column I	5

Final Review IS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column J	B23-12051
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0338
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.141$, $df=7.365$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column J	79.54
17	Difference between means (J - A) $\pm$ SEM	-8.880 ± 4.148
18	95% confidence interval	-18.59 to 0.8297
19	R squared (eta squared)	0.3836
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.831, 4, 4
23	P value	0.5722
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column J	5

Final Review: J4

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column K	B23-12841
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0134
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.723, df=7.791
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column K	78.04
17	Difference between means (K - A) $\pm$ SEM	-10.38 $\pm$ 3.812
18	95% confidence interval	-19.21 to -1.549
19	R squared (eta squared)	0.4876
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.392, 4, 4
23	P value	0.7566
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column K	5

Final Review 59

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column L	B23-12053
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0011
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=4.948, df=6.273
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column L	63.40
17	Difference between means (L - A) $\pm$ SEM	-25.02 $\pm$ 5.056
18	95% confidence interval	-37.26 to -12.78
19	R squared (eta squared)	0.7961
20		
21	F test to compare variances	
22	F, DFn, Dfd	3.208, 4, 4
23	P value	0.2851
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column L	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column M	B23-12054
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0045
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=3.431, df=8.000
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column M	76.46
17	Difference between means (M - A) $\pm$ SEM	-11.96 $\pm$ 3.485
18	95% confidence interval	-20.00 to -3.923
19	R squared (eta squared)	0.5954
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.000, 4, 4
23	P value	0.9997
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column M	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column N	B23-12019
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0794
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.618$, $df=5.764$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column N	79.24
17	Difference between means ($N - A$) $\pm$ SEM	-9.180 ± 5.675
18	95% confidence interval	-23.21 to 4.845
19	R squared (eta squared)	0.3122
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.301, 4, 4
23	P value	0.1866
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column N	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column O	B23-12020
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0172
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.757$, $df=5.771$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column O	72.80
17	Difference between means (O - A) $\pm$ SEM	-15.62 ± 5.666
18	95% confidence interval	-29.62 to -1.621
19	R squared (eta squared)	0.5684
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.285, 4, 4
23	P value	0.1877
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column O	5

Final Review: J)

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column P	B23-12021
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0256
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.307$, $df=7.698$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column P	79.44
17	Difference between means ($P - A$) $\pm$ SEM	-8.980 ± 3.893
18	95% confidence interval	-18.02 to 0.05859
19	R squared (eta squared)	0.4087
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.494, 4, 4
23	P value	0.7066
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column P	5

Final Review 13

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column Q	B23-12052
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1706
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.061$, $df=4.621$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column Q	82.80
17	Difference between means ($Q - A$) $\pm$ SEM	-5.620 ± 5.299
18	95% confidence interval	-19.58 to 8.344
19	R squared (eta squared)	0.1958
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.897, 3, 4
23	P value	0.3307
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column Q	4

Final Review 35

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column R	B23-12123
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0397
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.010, df=7.957
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column R	81.14
17	Difference between means (R - A) $\pm$ SEM	-7.280 $\pm$ 3.622
18	95% confidence interval	-15.64 to 1.079
19	R squared (eta squared)	0.3368
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.159, 4, 4
23	P value	0.8898
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column R	5

Final Review!!

Welch's t test Tabular results		
1	Table Analyzed	RHMP 3 9.6.23 Mussels
2		
3	Column S	B23-12124
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0929
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.501$, $df=5.774$
13		
14	How big is the difference?	
15	Mean of column A	88.42
16	Mean of column S	79.92
17	Difference between means ($S - A$) $\pm$ SEM	-8.500 ± 5.661
18	95% confidence interval	-22.48 to 5.485
19	R squared (eta squared)	0.2808
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.275, 4, 4
23	P value	0.1884
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column S	5

Final Review: JS

Grubb's test for outliers.

Instructions:

Enter a list of values into the white column, then press **CALCULATE**

If nothing happens when you press Calculate, press the RETURN key first. You cannot press buttons while you are entering or editing data.

Data: P<0.05??

78.94736842
71.42857143
89.47368421
91.35338346

0

Yes

Descriptive statistics

Mean=	66.2406
SD=	37.90324
N=	5

Results:

Grubb's test calculates a P value only for the value furthest from the rest. If the test determines that the value is an outlier, you'll see "Yes" next to that value. Otherwise, you'll see the word "No".

Reference:

Outliers in Statistical Data (3rd edition), V. Barnett and T. Lewis, Wiley, 1994.

Critical value for Grubb's test. If Z is greater than the tabulated value, then P is less than 0.05

N	CriticalZ 5%
3	1.15
4	1.48
5	1.71
6	1.89
7	2.02
8	2.13
9	2.21
10	2.29
11	2.34
12	2.41
13	2.46
14	2.51
15	2.55
16	2.59
17	2.62
18	2.65
19	2.68
20	2.71
21	2.73
22	2.76
23	2.78
24	2.80
25	2.82
26	2.84
27	2.86
28	2.88
29	2.89
30	2.91
31	2.92
32	2.94
33	2.95
34	2.97
35	2.98
36	2.99
37	3.00
38	3.01
39	3.03
40	3.04
50	3.13
60	3.20
70	3.26
80	3.31
90	3.35
100	3.38
110	3.42
120	3.44
130	3.47
140	3.49

These are two tailed P values.

Embryo-Larval Development Test

Stock Preparation Worksheet

Test Species: M. galloprovincialis Test Date: 9/6/2023
 Batch ID: WSP stored, S10 stored, Field Analyst: AL
 Test Type: Embryo-Larval Development

Task	
Spawning Induction	0930
Spawning Begins	1030
# Males/# Females	2/2
Spawn Condition	good
Fertilization Initiated	1120
Fertilization End/Eggs Rinsed	1150/1220
Embryo Counts	1245
Test Initiation	1340

Embryo Density Counts		# per ²⁰ 100 μ L				Mean	Mean #/mL
Stock #	Stock Volume (mL)	Rep 1	Rep 2	Rep 3	Rep 4	#/100 μ L	(x10) x50
Stock 1	300	16	19	12	15	15.5	
Stock 2	300	11	7	8	14	10	
Stock 2.1	250	16	17	14	14	16.25	762.5

Cell Division:

	% Divided
Stock 1	70
Stock 2	97
Stock 2.1	99

Selected Stock:	2.1
-----------------	-----

Adjust selected embryo stock to 500 embryos/mL.
 Dilution Factor = Stock Density/mL/500

Stock Density
762.5
 500

Dil Factor
1.83

In 10 mL sample volume add 500 μ L of 500 embryo/mL stock to obtain 25 embryos/mL in test vials.

Notes:

$T\phi_1 = 258$ $T\phi_2 = 266$ $T\phi_3 = 274$ $T\phi_4 = 264$ $T\phi_5 = 269$
 $\bar{x} = 266.2$

QA Review:

JF 12/18/23

Final Review: MK 12/20/23

Water Quality for Bivalve Development

Client: WSP

Test Species: *M. galloprovincialis*

Project ID: RHMP 2023 #3 ~~SCCWRP~~ ^{AK}

Start Date/Time: 9/6/2023 1340

Test No. ~~23-019-036~~ ^{AK} 23-09-019 to -036

End Date/Time: 9/8/2023 1430

Sample ID	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
Lab Control #1	Temp. (°C)	15.2	14.6	15.6
	Salinity (ppt)	31.1	31.4	31.4
	pH (units)	7.52	7.73	7.54
	DO (mg/L)	7.5	8.0	7.6
B23-12014	Temp. (°C)	15.0	14.7	14.9
	Salinity (ppt)	31.4	31.8	31.6
	pH (units)	7.63	7.75	7.62
	DO (mg/L)	7.9	8.1	7.7
B23-12047	Temp. (°C)	15.3	14.6	15.1
	Salinity (ppt)	31.5	31.9	31.6
	pH (units)	7.64	7.79	7.65
	DO (mg/L)	7.4	8.0	7.6
B23-12116	Temp. (°C)	15.4	14.6	14.9
	Salinity (ppt)	31.4	31.9	31.9
	pH (units)	7.68	7.83	7.70
	DO (mg/L)	7.5	8.0	7.8
B23-12121	Temp. (°C)	15.5	14.4	14.0
	Salinity (ppt)	31.4	32.1	32.2
	pH (units)	7.69	7.87	7.78
	DO (mg/L)	7.6	8.0	7.9
B23-12122	Temp. (°C)	15.3	14.3	14.5
	Salinity (ppt)	31.4	31.9	32.1
	pH (units)	7.71	7.86	7.75
	DO (mg/L)	7.5	8.0	7.9
B23-12048	Temp. (°C)	15.4	14.5	14.4
	Salinity (ppt)	31.4	31.8	32.0
	pH (units)	7.66	7.72	7.65
	DO (mg/L)	7.6	8.0	8.0
Tech Initials:		JF	KYB	RJ

Source of Animals: Mission Bay/NIWL

Date Received: 8/29/23

Comments:

QC Check: JF 12/8/23

Final Review: AK 12/21/23

Water Quality for Bivalve Development

Client: WSP

Test Species: *M. galloprovincialis*

Project ID: RHMP 2023 #3

Start Date/Time: 9/6/2023 1340

Test No. ~~23-019-076~~ ^{M1-} 23-09-019 to -036

End Date/Time: 9/8/2023 1430

Sample ID	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
B23-12049	Temp. (°C)	14.9	14.4	14.5
	Salinity (ppt)	31.6	31.9	32.2
	pH (units)	7.66	7.76	7.64
	DO (mg/L)	7.7	8.0	8.0
B23-12050	Temp. (°C)	15.0	14.4	14.6
	Salinity (ppt)	31.6	32.0	32.2
	pH (units)	7.63	7.75	7.60
	DO (mg/L)	7.6	8.0	8.0
B23-12051	Temp. (°C)	14.9	14.4	14.3
	Salinity (ppt)	31.4	32.0	32.1
	pH (units)	7.68	7.74	7.57
	DO (mg/L)	7.5	8.0	8.0
B23-12841	Temp. (°C)	14.9	14.2	14.0
	Salinity (ppt)	31.6	32.3	31.2
	pH (units)	7.64	7.76	7.60
	DO (mg/L)	7.8	8.1	8.1
B23-12053	Temp. (°C)	15.1	14.3	14.0
	Salinity (ppt)	31.4	32.2	32.4
	pH (units)	7.62	7.68	7.58
	DO (mg/L)	7.6	8.1	8.1
B23-12054	Temp. (°C)	14.6	14.3	14.2
	Salinity (ppt)	31.4	32.1	32.4
	pH (units)	7.64	7.70	7.67
	DO (mg/L)	7.9	8.1	7.8
B23-12019	Temp. (°C)	14.6	14.2	14.2
	Salinity (ppt)	31.5	32.1	32.8
	pH (units)	7.65	7.74	7.67
	DO (mg/L)	7.8	8.1	8.1 7.9
Tech Initials:		JP	KYB	RJ

Source of Animals: Mission Bay/NMWC

Date Received: 8/29/23

Comments:

QC Check: JP 12/18/23

Final Review: AB 12/21/23

Amec Foster Wheeler Toxicity Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

Water Quality for Bivalve Development

Client: WSP
 Project ID: RHMP 2023 #3
 Test No. ~~23-09-036~~ 23-09-019 to -036

Test Species: M. galloprovincialis
 Start Date/Time: 9/6/2023 1340
 End Date/Time: 9/8/2023 1430

Sample ID	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
B23-12020	Temp. (°C)	14.5	14.2	14.1
	Salinity (ppt)	31.5	32.3	32.8
	pH (units)	7.64	7.79	7.71
	DO (mg/L)	7.9	8.0	8.0
B23-12021	Temp. (°C)	14.8	14.1	14.1
	Salinity (ppt)	31.4	32.3	32.9
	pH (units)	7.65	7.77	7.69
	DO (mg/L)	7.7	8.1	8.1
B23-12052	Temp. (°C)	14.9	14.2	14.1
	Salinity (ppt)	31.4	32.0	32.2
	pH (units)	7.65	7.74	7.66
	DO (mg/L)	7.8	8.2	8.2
B23-12123	Temp. (°C)	14.8	14.1	14.1
	Salinity (ppt)	31.6	32.1	32.5
	pH (units)	7.64	7.74	7.63
	DO (mg/L)	7.8	8.2	8.2
B23-12124	Temp. (°C)	14.4	14.0	14.0
	Salinity (ppt)	31.7	32.1	32.6
	pH (units)	7.64	7.76	7.65
	DO (mg/L)	8.0	8.2	8.2
Lab Control #2	Temp. (°C)	14.6	14.0	14.0
	Salinity (ppt)	31.4	31.5	31.6
	pH (units)	7.61	7.73	7.62
	DO (mg/L)	7.8	8.1	8.2
	Temp. (°C)			
	Salinity (ppt)			
	pH (units)			
	DO (mg/L)			
Tech Initials:		JF	KYB	RJ

Source of Animals: MISSION Bay / NIWL

Date Received: 8/29/23

Comments:

QC Check: JF 12/8/23

Final Review: AG 12/21/23

Embryo-Larval Development Test Scoring Worksheet

Client: WSP
Project ID: RHMP 2023 #3
Test No.: 23-09-019 to -036

Test Species: *M. galloprovincialis*
Start Date: 9/6/2023 1346
End Date: 9/8/2023 1436

Random #	# Counted	# Normal	Tech Initials	Notes
1	270	246	HK	10/17/23
2	213	193		
3	220	200		
4	HW 2302	286		
5	241	229		
6	263 243 HK 243 HK	243 243	HK	
7	246	228		
8	250	238		
9	202	240		
10	184	154 173		
11	251	238		
12	251	223		
13	235	212		
14	212	199		
15	261	240		
16	156	143		Heavy debris
17	227	191		
18	192	184		
19	180	171		
20	262	226		
21	242 242 242 242 242	202 244 224		10/18/23 heavy debris
22	2083	182		
23	246	220		
24	247	228		
25	261	235		
26	230	210		
27	226	196		
28	191	157		HK 10/20/23
29	297	272		+
30	210	192		Slight debris L
31	250	239		HK 10/23/23
32	239	210		
33	197	182		
34	189	175		
35	193	176		
36	257	241		
37	248	236		
38	HW 174 180 HK 180 174	180 174		
39	239	222		
40	219	199		

QC Check: JF 12/18/23

Final Review: MF 12/20/23

Embryo-Larval Development Test Scoring Worksheet

Client: WSP
Project ID: RHMP 2023 #3
Test No.: 23-09-019 to -036

Test Species: *M. galloprovincialis*
Start Date: 9/6/2023 1340
End Date: 9/8/2023 1430

Random #	# Counted	# Normal	Tech Initials	Notes
41	227	210	HK	HK 10/23/23
42	229	217	HK	
43	190	103		
44	176	168		
45	209	200		
46	200	193		
47	293	273		
48	235	221		
49	245	228		
50	0	0		Not Innoculated
51	222	197	HK	
52	229 ^{HK} 223 ^{HK}	219 ^{HK} 219 ^{HK}		
53	201	188		
54	247	257		
55	207	195		
56	238	230		
57	257	247		HK 10/24/23
58	219	209		
59	171	159		
60	254	242		
61	225	207		
62	234	223		
63	250	250		
64	249	236		
65	246	202		
66	207	198		HK 10/25/23
67	236	222		
68	233	220		
69	213	199		
70	144	148		
71	207	190		
72	231	220		
73	217	204		
74	207	198		
75	212	202		
76	221	204		
77	228	214		
78	210	199		debris
79	245	227		
80	216	200		debris

QC Check: JF 12/8/23

Final Review: MK 12/20/23

Embryo-Larval Development Test Scoring Worksheet

Client: WSP

Project ID: RHMP 2023 #3

Test No.: 23-69-019 to -036

Test Species: *M. galloprovincialis*

Start Date: 9/6/2023 1340

End Date: 9/8/2023 1430

[illegible]

QC Check: JF/12/8/23

Final Review: MK 12/20/23

WSP
RHMP #3 Sediment Testing
Random Numbers

SAMPLE ID	Rand#	
Lab Control	63 250/250	98
	5 241/229	95
	39 237/222	93
	62 234/223	95
	4 202/280	95
B23-12014	10 194/181	95
	51 222/147	89
	36 257/241	94
	99 154/157	90
	1 270/240	91
B23-12047	96 286/267	93
	40 219/199	91
	87 204/185	91
	81 244/222	91
	72 231/220	95
B23-12116	41 227/218	92
	57 257/247	96
	47 293/273	93
	73 207/198	96
	82 233/222	95
B23-12121	93 198/178	89
	80 216/200	92
	35 193/176	91
	30 202/210	92
	20 262/224	96
B23-12122	38 174/150	87
	28 181/157	82
	52 226/219	97
	92 200/187	91
	91 228/213	93
B23-12048	68 233/220	94
	85 249/230	92
	29 297/272	92
	48 235/221	94
	77 228/216	95

QC Check - Mussel: JFono RV/LTB

NOM
176

B23-1214 = 73

WSP
RHMP #3 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12049	97 169/184 97 46 200/1293 94 97 100 153/137 89 179/166 93 89 229/216 94 78 210/199 95
B23-12050	13 735/1212 90 21 234/1244 85 92 75 712/202 95 98 233/214 92 49 249/228 92
B23-12051	53 201/188 94 79 245/227 93 58 219/209 95 66 207/198 96 64 249/236 95
B23-12841	24 247/228 92 61 225/207 92 69 213/199 93 23 244/220 90 18 192/184 96
B23-12053	59 171/159 93 3 220/200 90 16 156/145 91 2 213/193 90 70 164/148 90
B23-12054	84 230/212 92 94 236/221 94 45 209/200 96 22 205/182 90 65 240/202 92
B23-12019	37 248/236 95 34 189/175 93 33 197/182 92 86 236/221 94 9 202/240 92

QC Check - Mussel: JF 000 RV/LTB

WSP
RHMP #3 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12020	14 212/199 94
	83 260/243 93
	90 206/187 91
	19 180/171 95
	44 176/168 95
B23-12021	17 227/191 84
	32 210/239 88
	12 251/223 88
	25 225/241 235 90
	27 226/198 87
B23-12052	26 230/202
	95 199/190
	11 231/223
	6 263/243
B23-12123	50 010 0
	67 236/222 94
	76 221/204 92
	71 207/198 96
	42 229/217 95
B23-12124	8 250/238 95
	56 238/230 97
	55 207/195 94
	54 267/257 90
	74 185/198 93
Lab Control # 2	43 198/183 92
	88 289/271 94
	31 250/239 96
	7 246/228 93
	60 254/242 95
	15 241/240 92

QC Check - Mussel: JP 260 RV/LYB

WSP
RHMP #3 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control ✖ l	63 5 39 62 4
B23-12014	10 51 36 99 1
B23-12047	96 40 87 81 72
B23-12116	41 57 47 73 82
B23-12121	93 80 35 30 20
B23-12122	38 28 52 92 91
B23-12048	68 85 29 48 77

QC Check - Mussel: RW/KYB

WSP
RHMP #3 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12049	97 46 100 89 78
B23-12050	13 21 75 98 49
B23-12051	53 79 58 66 64
B23-12841	24 61 69 23 18
B23-12053	59 3 16 2 70
B23-12054	84 94 45 22 65
B23-12019	37 34 33 86 9

QC Check - Mussel: RN / KYB

WSP
RHMP #3 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12020	14 83 90 19 44
B23-12021	17 32 12 25 27
B23-12052	26 95 11 6 50
B23-12123	67 76 71 42 8
B23-12124	56 55 54 74 43
Lab Control # 2	88 31 7 60 15

QC Check - Mussel: 21/11/18

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: ~~E. estuarius~~ ^{JF} M. galloprovincialis

Project ID: RHMP 2023 #3

Start Date: 9/6/2023 1340

Test No.: 23-09-019-036

End Date: 9/8/2023 1430

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.94

(x1.22)

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃)	Notes
Lab Control	0	1	41.00	41.22	10/11/23 HK
B23-12014	0	2	41.00	41.22	1A
B23-12047	0	3	1.03	1.26	
B23-12116	0	4	1.16	1.42	
B23-12121	0	5	2.41	2.94	
B23-12122	0	6	2.07	2.53	
B23-12048	0	7	41.00	51.22	
B23-12049	0	8	41.00	41.22	
B23-12050	0	9	41.00	41.22	
B23-12051	0	10	41.00	41.22	
B23-12841	0	11	41.00	51.22	
B23-12053	0	12	41.00	51.22	
B23-12054	0	13	41.00	51.22	
B23-12019	0	14	41.00	51.22	
B23-12020	0	15	1.47	^{Mk} +80 1.79	
B23-12021	0	16	1.16	^{Mk} +79 1.42	
B23-12052	0	17	41.00	51.22	
B23-12123	0	18	41.00	51.22	
B23-12124	0	19	41.00	51.22	
Lab Control #2	16-0	20	41.00	51.22	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments: [Ⓐ] Detection limit 1-12 [Ⓑ] Detection limit 2-47 mg

QC Check: JF 12/8/23

Final Review: MK 12/20/23

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Project ID: RHMP 2023 #3

Test No.: 23-09-01940-036

Test Species: ~~E. estuarius~~ *M. galloprovincialis*

Start Date: 9/6/2023 1340

End Date: 9/8/2023 1430

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.94

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃)	Notes
Lab Control	3F 10/2	21	<1.00	<1.22	10/11/23 MK
B23-12014	MK 010 3F 10/2	22	1.42	1.73	(A)
B23-12047	MK 010 3F 10/2	23	1.09	2.06	(A)
B23-12116	MK 010 3F 10/2	24	2.21	2.70	(A)
B23-12121	MK 010 3F 10/2	25	4.54	5.54	(A)
B23-12122	MK 010 3F 10/2	26	3.72	4.54	(A)
B23-12048	MK 010 3F 10/2	27	<2.00	<2.44	(B)
B23-12049	MK 010 3F 10/2	28	<2.00	<2.44	
B23-12050	MK 010 3F 10/2	29	<2.00	<2.44	
B23-12051	MK 010 3F 10/2	30	<2.00	<2.44	
B23-12841	MK 010 3F 10/2	31	<2.00	<2.44	
B23-12053	MK 010 3F 10/2	32	<2.00	<2.44	
B23-12054	MK 010 3F 10/2	33	<2.00	<2.44	
B23-12019	MK 010 3F 10/2	34	<2.00	<2.44	
B23-12020	MK 010 3F 10/2	35	2.51	3.06	
B23-12021	MK 010 3F 10/2	36	2.03	2.48	
B23-12052	MK 010 3F 10/2	37	2.89	3.53	
B23-12123	MK 010 3F 10/2	38	<2.00	<2.44	
B23-12124	MK 010 3F 10/2	39	<2.00	<2.44	
Lab Control #2	MK 010 3F 10/2	40	<2.00	<2.44	(B)

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments: Detection Limit 1-2^(A) Detection Limit 2-4^(B)

QC Check: 3F 12/8/23

Final Review: MK 12/20/23

Unionized Ammonia Calculation for Pressure of 1 atm
Input 'Shaded' data

I	pK
1	9.26
2	9.27
3	9.28
4	9.29
5	9.30
6	9.32
7	9.33
8	9.34

Log Numb Beaker	Day	Dilution		Total Ammonia (mg/L)	Temp (C)	Salinity (ppt)	pH	Temp (K)	I	I Rounded	pK	Unionized Ammonia	D.O. (mg/L)	Beaker Num.	Station
Lab Control		0	0	<	1.22	15.2	31.1	7.52	288.36	6.90	7	9.33	0.009		0
B23-12014		0	0	<	1.22	15	31.4	7.63	288.16	6.96	7	9.33	0.012		0
B23-12047		0	0		1.26	15.3	31.5	7.64	288.46	6.98	7	9.33	0.012		0
B23-12116		0	0		1.42	15.4	31.4	7.68	288.56	6.96	7	9.33	0.016		0
B23-12121		0	0		2.94	15.5	31.4	7.69	288.66	6.96	7	9.33	0.033		0
B23-12122		0	0		2.53	15.3	31.4	7.71	288.46	6.96	7	9.33	0.029		0
B23-12048		0	0	<	1.22	15.4	31.4	7.66	288.56	6.96	7	9.33	0.013		0
B23-12049		0	0	<	1.22	14.9	31.6	7.66	288.06	7.00	7	9.33	0.012		0
B23-12050		0	0	<	1.22	15	31.6	7.63	288.16	7.00	7	9.33	0.012		0
B23-12051		0	0	<	1.22	14.9	31.4	7.68	288.06	6.96	7	9.33	0.013		0
B23-12841		0	0	<	1.22	14.9	31.6	7.64	288.06	7.00	7	9.33	0.012		0
B23-12053		0	0	<	1.22	15.1	31.4	7.62	288.26	6.96	7	9.33	0.011		0
B23-12054		0	0	<	1.2	14.6	31.4	7.64	287.76	6.96	7	9.33	0.011		0
B23-12019		0	0	<	1.2	14.6	31.5	7.65	287.76	6.98	7	9.33	0.012		0
B23-12020		0	0		1.80	14.5	31.5	7.64	287.66	6.98	7	9.33	0.017		0
B23-12021		0	0		1.79	14.8	31.4	7.65	287.96	6.96	7	9.33	0.018		0
B23-12052		0	0	<	1.22	14.9	31.4	7.65	288.06	6.96	7	9.33	0.012		0
B23-12123		0	0	<	1.22	14.8	31.6	7.64	287.96	7.003607	7	9.33	0.011661		0
B23-12124		0	0	<	1.22	14.4	31.7	7.64	287.56	7.024866	7	9.33	0.011322		0
Lab Control		2	0	<	1.22	15.6	31.4	7.54	288.76	6.961104	7	9.33	0.009847		0
B23-12014		2	0		1.73	14.9	31.6	7.62	288.06	7.003607	7	9.33	0.015916		0
B23-12047		2	0		2.06	15.1	31.6	7.65	288.26	7.003607	7	9.33	0.020596		0
B23-12116		2	0		2.7	14.9	31.9	7.7	288.06	7.067396	7	9.33	0.029809		0
B23-12121		2	0		5.54	14.6	32.2	7.78	287.76	7.131224	7	9.33	0.071767		0
B23-12122		2	0		4.54	14.5	32.1	7.75	287.66	7.109944	7	9.33	0.054532		0
B23-12048		2	0	<	2.44	14.4	32	7.65	287.56	7.088668	7	9.33	0.023166		0
B23-12049		2	0	<	2.44	14.5	32.2	7.64	287.66	7.131224	7	9.33	0.022811		0
B23-12050		2	0	<	2.44	14.6	32.2	7.6	287.76	7.131224	7	9.33	0.020976		0
B23-12051		2	0	<	2.44	14.3	32.1	7.57	287.46	7.109944	7	9.33	0.019157		0
B23-12841		2	0	<	2.44	14	31.2	7.6	287.16	6.918618	7	9.33	0.020065		0
B23-12053		2	0	<	2.44	14	32.4	7.58	287.16	7.173799	7	9.33	0.019169		0
B23-12054		2	0	<	2.44	14.2	32.4	7.67	287.36	7.173799	7	9.33	0.023891		0
B23-12019		2	0	<	2.44	14.2	32.8	7.67	287.36	7.259	7	9.33	0.023891		0
B23-12020		2	0		3.06	14.1	32.8	7.71	287.26	7.259	7	9.33	0.03258		0
B23-12021		2	0		2.48	14.1	32.9	7.69	287.26	7.280312	7	9.33	0.025228		0
B23-12052		2	0		3.53	14.1	32.2	7.66	287.26	7.131224	7	9.33	0.033536		0
B23-12123		2	0	<	2.44	14.1	32.5	7.63	287.26	7.195092	7	9.33	0.021647		0
B23-12124		2	0	<	2.44	14	32.6	7.65	287.16	7.216391	7	9.33	0.022491		0

Date Entered: JF 12/9/23

Data QC: *AK*

Bivalve Batch #4

9/14/23

48hr Bivalve Development Results

Client: WSP

Project ID: RHMP #4 - SD Bay North and Central

Species *Mytilus galloprovincialis*

Test No. 23-09-047 to 23-09-063

Sample ID	Rand #	# Initial Embryos	# Counted	# Normal	Combined % Normal-Alive	Mean Combined % Normal-Alive	% of Control
Lab Control	20	295	277	267	90.5	89.5	NA
	25	295	294	277	93.9		
	21	295	287	276	93.6		
	66	295	282	263	89.2		
	76	295	264	237	80.3		
B23-12117	86	295	231	227	76.9	81.0	90.5
	48	295	243	238	80.7		
	84	295	244	238	80.7		
	40	295	263	256	86.8		
	16	295	249	236	80.0		
B23-12118	78	295	243	238	80.7	75.7	84.5
	55	295	268	257	87.1		
	83	295	204	193	65.4		
	73	295	230	223	75.6		
	31	295	217	205	69.5		
B23-12119	30	295	245	236	80.0	78.9	88.2
	45	295	266	256	86.8		
	51	295	201	190	64.4		
	50	295	247	239	81.0		
	68	295	253	243	82.4		
B23-12120	58	295	256	250	84.7	83.1	92.9
	37	295	261	245	83.1		
	42	295	229	224	75.9		
	8	295	271	259	87.8		
	89	295	263	248	84.1		
B23-12114	82	295	205	193	65.4	74.8	83.6
	38	295	254	236	80.0		
	90	295	205	195	66.1		
	43	295	228	220	74.6		
	67	295	269	260	88.1		
B23-12115	77	295	267	258	87.5	82.5	92.2
	24	295	255	246	83.4		
	5	295	239	230	78.0		
	18	295	253	233	79.0		
	52	295	259	250	84.7		

Notes: **Bold** Indicates statistically significant difference.

Data Entered: MK 12/14/23

QC Check:

12/26/23

Final Review:

[Signature]

WSP Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

48hr Bivalve Development Results

Client: WSP

Project ID: RHMP #4 - SD Bay North and Central

Species *Mytilus galloprovincialis*

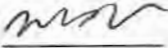
Test No. 23-09-047 to 23-09-063

Sample ID	Rand #	# Initial Embryos	# Counted	# Normal	Combined % Normal-Alive	Mean Combined % Normal-Alive	% of Control
B23-12009	85	295	250	240	81.4	78.4	87.6
	36	295	231	218	73.9		
	65	295	251	239	81.0		
	7	295	233	220	74.6		
	56	295	249	239	81.0		
B23-12010	57	295	213	206	69.8	81.1	90.6
	6	295	251	237	80.3		
	74	295	272	266	90.2		
	27	295	239	228	77.3		
	49	295	266	259	87.8		
B23-12011	70	295	274	259	87.8	87.3	97.6
	80	295	246	237	80.3		
	12	295	263	255	86.4		
	69	295	288	273	92.5		
	35	295	279	264	89.5		
B23-12012	23	295	276	264	89.5	81.1	90.6
	14	295	233	223	75.6		
	17	295	252	239	81.0		
	39	295	263	250	84.7		
	41	295	231	220	74.6		
B23-12099	53	295	282	267	90.5	85.2	95.2
	9	295	269	260	88.1		
	44	295	288	261	88.5		
	71	295	234	225	76.3		
	28	295	253	244	82.7		
B23-12103	75	295	268	249	84.4	77.6	86.7
	3	295	261	252	85.4		
	2	295	219	204	69.2		
	33	295	244	215	72.9		
	47	295	230	224	75.9		
B23-12107	61	295	272	259	87.8	88.3	98.7
	34	295	263	249	84.4		
	54	310	310	302	97.4		
	15	295	267	256	86.8		
	63	295	259	251	85.1		

Notes: **Bold** indicates statistically significant difference.

Data Entered: MK 12/14/23

QC Check: 16/12/26/23

Final Review: 

WSP Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

48hr Bivalve Development Results

Client: WSP

Project ID: RHMP #4 - SD Bay North and Central

Species *Mytilus galloprovincialis*

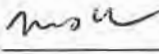
Test No. 23-09-047 to 23-09-063

Sample ID	Rand #	# Initial Embryos	# Counted	# Normal	Combined % Normal-Alive	Mean Combined % Normal-Alive	% of Control
B23-12109	59	305	305	292	95.7	86.1	96.2
	46	295	254	239	81.0		
	11	295	263	248	84.1		
	62	295	271	259	87.8		
	13	295	249	242	82.0		
i2110 B23-110 mol	64	295	291	278	94.2	88.5	98.9
	10	295	269	255	86.4		
	22	295	280	273	92.5		
	60	295	270	254	86.1		
	72	295	256	245	83.1		
B23-12155	79	295	230	214	72.5	73.8	82.5
	88	295	241	204	69.2		
	32	295	231	214	72.5		
	87	295	228	203	68.8		
	19	295	273	254	86.1		
B23-12098	1	295	288	275	93.2	90.0	100.5
	81	295	289	277	93.9		
	4	295	268	257	87.1		
	26	295	282	268	90.8		
	29	295	262	250	84.7		

Notes: Bold indicates statistically significant difference.

Data Entered: MK 12/14/23

QC Check: AB 12/26/23

Final Review: 

WSP Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column B	B23-12117
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0121
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.879$, $df=6.873$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column B	81.02
17	Difference between means ($B - A$) $\pm$ SEM	-8.480 ± 2.946
18	95% confidence interval	-15.47 to -1.489
19	R squared (eta squared)	0.5467
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.361, 4, 4
23	P value	0.4258
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column C	B23-12118
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0101
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=3.015$, $df=6.793$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column C	75.66
17	Difference between means (C - A) $\pm$ SEM	-13.84 ± 4.590
18	95% confidence interval	-24.76 to -2.919
19	R squared (eta squared)	0.5723
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.457, 4, 4
23	P value	0.4053
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Fungal Review JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column D	B23-12119
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0267
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.330$, $df=6.854$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column D	78.92
17	Difference between means ($D - A \pm SEM$)	-10.58 ± 4.541
18	95% confidence interval	-21.36 to 0.2044
19	R squared (eta squared)	0.4419
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.383, 4, 4
23	P value	0.4209
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column D	5

Final Review: 39

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column E	B23-12120
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0399
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.021$, $df=7.622$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column E	83.12
17	Difference between means ($E - A$) $\pm$ SEM	-6.380 ± 3.157
18	95% confidence interval	-13.72 to 0.9644
19	R squared (eta squared)	0.3488
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.573, 4, 4
23	P value	0.6714
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

Final Review IS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column F	B23-12114
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0117
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.962, df=6.388
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column F	74.84
17	Difference between means (F - A) $\pm$ SEM	-14.66 $\pm$ 4.949
18	95% confidence interval	-26.59 to -2.726
19	R squared (eta squared)	0.5787
20		
21	F test to compare variances	
22	F, DFn, Dfd	3.019, 4, 4
23	P value	0.3098
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column G	B23-12115
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0270
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.295, df=7.267$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column G	82.52
17	Difference between means (G - A) $\pm$ SEM	-6.980 ± 3.042
18	95% confidence interval	-14.12 to 0.1594
19	R squared (eta squared)	0.4201
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.930, 4, 4
23	P value	0.5398
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column G	B23-12115
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0270
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.295, df=7.267
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column G	82.52
17	Difference between means (G - A) $\pm$ SEM	-6.980 $\pm$ 3.042
18	95% confidence interval	-14.12 to 0.1594
19	R squared (eta squared)	0.4201
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.930, 4, 4
23	P value	0.5398
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column H	B23-12009
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0037
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=3.716, df=7.077
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column H	78.38
17	Difference between means (H - A) $\pm$ SEM	-11.12 $\pm$ 2.993
18	95% confidence interval	-18.18 to -4.059
19	R squared (eta squared)	0.6611
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.131, 4, 4
23	P value	0.4818
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column H	5

Final Review 33

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column I	B23-12010
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0495
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.901$, $df=6.997$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column I	81.08
17	Difference between means (I - A) $\pm$ SEM	-8.420 ± 4.429
18	95% confidence interval	-18.89 to 2.055
19	R squared (eta squared)	0.3406
20		
21	F test to compare variances	
22	F, DF _n , DF _d	2.219, 4, 4
23	P value	0.4592
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column I	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column J	B23-12011
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.2555
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.6891$, $df=7.704$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column J	87.30
17	Difference between means ($J - A$) $\pm$ SEM	-2.200 ± 3.192
18	95% confidence interval	-9.611 to 5.211
19	R squared (eta squared)	0.05806
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.488, 4, 4
23	P value	0.7097
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column J	5

Final Review : JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column K	B23-12012
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0272
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.259, df=7.881
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column K	81.08
17	Difference between means (K - A) $\pm$ SEM	-8.420 $\pm$ 3.728
18	95% confidence interval	-17.04 to 0.1989
19	R squared (eta squared)	0.3930
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.280, 4, 4
23	P value	0.8167
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column K	5

Primal Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column L	B23-12099
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1324
9	P value summary	ns
10	Significantly different (P < 0.05)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=1.199, df=7.985
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column L	85.22
17	Difference between means (L - A) $\pm$ SEM	-4.280 $\pm$ 3.569
18	95% confidence interval	-12.51 to 3.953
19	R squared (eta squared)	0.1526
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.090, 4, 4
23	P value	0.9356
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column L	5

Fring Review: JJ

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column M	B23-12103
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0096
9	P value summary	**
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.964$, $df=7.534$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column M	77.56
17	Difference between means ($M - A$) $\pm$ SEM	-11.94 ± 4.028
18	95% confidence interval	-21.33 to -2.550
19	R squared (eta squared)	0.5384
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.662, 4, 4
23	P value	0.6346
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column M	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column N	B23-12107
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.3670
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.3518$, $df=7.982$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column N	88.30
17	Difference between means ($N - A$) $\pm$ SEM	-1.200 ± 3.411
18	95% confidence interval	-9.068 to 6.668
19	R squared (eta squared)	0.01527
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.101, 4, 4
23	P value	0.9282
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column N	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column O	B23-12109
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1897
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.9307$, $df=7.954$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column O	86.12
17	Difference between means (O - A) $\pm$ SEM	-3.380 ± 3.632
18	95% confidence interval	-11.76 to 5.003
19	R squared (eta squared)	0.09821
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.164, 4, 4
23	P value	0.8867
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column O	5

Final Review 33

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column P	B23-12110
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.3783
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.3212$, $df=7.794$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column P	88.46
17	Difference between means ($P - A$) $\pm$ SEM	-1.040 ± 3.238
18	95% confidence interval	-8.542 to 6.462
19	R squared (eta squared)	0.01306
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.388, 4, 4
23	P value	0.7583
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column P	5

Final Review JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column Q	B23-12155
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0025
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=3.903, df=7.549
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column Q	73.82
17	Difference between means (Q - A) $\pm$ SEM	-15.68 $\pm$ 4.017
18	95% confidence interval	-25.04 to -6.319
19	R squared (eta squared)	0.6687
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.647, 4, 4
23	P value	0.6405
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column Q	5

Final Review. JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 4 9.14.23 Mussels
2		
3	Column R	B23-12098
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.4444
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.1449$, $df=7.250$
13		
14	How big is the difference?	
15	Mean of column A	89.50
16	Mean of column R	89.94
17	Difference between means ($R - A$) $\pm$ SEM	0.4400 ± 3.037
18	95% confidence interval	-6.692 to 7.572
19	R squared (eta squared)	0.002887
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.948, 4, 4
23	P value	0.5342
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column R	5

Final Review: JS

Embryo-Larval Development Test Scoring Worksheet

Client: WSP
Project ID: RHMP 2023 #4
Test No.: 23-09-047 to 23-09-063

Test Species: *M. galloprovincialis*
Start Date: 9/14/2023 1440
End Date: 9/16/2023 1300

Random #	# Counted	# Normal	Tech Initials	Notes
1	253	243	BT	BT 10/25/23
2	239	230		Heavy debris in all trials
3	244	238		
4	252	239		
5	288	275		
6	245	236		
7	288	273		
8	267	258		
9	266	259		
10	277	267		
11	291	278		
12	228	220		
13	303	294		
14	263	250		
15	268	257		
16	287	276		10/26/23
17	246	237		a lot of fibers
18	276	264		
19	253	233		
20	282	263		
21	266	256		
22	233	223		
23	282	268		
24	204	193		thick debris
25	201	190		"
26	263	248		
27	254 270	254		10/29/23
28	273	259		
29	274	259		
30	251	237		
31	243	238		
32	268	249		
33	267	256		
34	262	250		
35	272	259		10/30/23
36	249	236		
37	288	261		
38	228	203		Very thick debris
39	230	224		
40	263	256		

QC Check: AG 12/14/23

Final Review: ME 12/20/23

Embryo-Larval Development Test Scoring Worksheet

Client: WSP
Project ID: RHMP 2023 #4
Test No.: 23-09-047 to 23-09-063

Test Species: M. galloprovincialis
Start Date: 9/14/2023 1440
End Date: 9/16/2023 1300

Random #	# Counted	# Normal	Tech Initials	Notes
41	250	243	BF	BF 10/30/23
42	264	237		
43	263	248		
44	294	277		
45	310	302		
46	279	264		
47	280	273		
48	205	195		
49	269	255		11/1/23
50	205	193		
51	219	204		
52	263	249		
53	231	227		
54	269	260		
55	241	204		Thick debris
56	254	236		
57	271	259		
58	231	218		11/2/23
59	253	244		
60	259	251		
61	271	259		
62	233	220		
63	254	249		
64	261	245		
65	263	255		
66	224	216		
67	254	239		
68	261	252		
69	231	214		11/8/23
70	273	254		
71	230	214		
72	282	267		
73	229	224		
74	259	250		
75	256	250		
76	251	239		
77	243	238		
78	239	228		
79	230	223		
80	289	277		

QC Check: 12/11/23

Final Review: 12/20/23 MK

Embryo-Larval Development Test Scoring Worksheet

Client: WSP
Project ID: RHMP 2023 #4
Test No.: 23-09-047 to 23-09-06

Test Species: *M. galloprovincialis*
Start Date: 9/14/2023 1440
End Date: 9/16/2023 1300

[illegible]

QC Check: AG 12/11/23

Final Review: MK 12/20/23

Embryo-Larval Development Test

Stock Preparation Worksheet

Test Species: M. galloprovincialis
 Batch ID: NINC 9/13/23
 Test Type: Embryo-Larval Development

Test Date: 9/14/23
 Analyst: AG

Task	
Spawning Induction	0940
Spawning Begins	1030
# Males/# Females	5/3
Spawn Condition	good
Fertilization Initiated	1140
Fertilization End/Eggs Rinsed	1200/1220
Embryo Counts	1330
Test Initiation	1440

Embryo Density Counts

per 100 μ L

Stock #	Stock Volume (mL)	Rep 1	Rep 2	Rep 3	Rep 4	Mean #/ 100 μ L	Mean #/mL (x10)50
Stock 1+2	300 200	10	19	17	19	16.25	812.5
Stock 2	200	17	13	14	15	14.75	737.5
Stock 2.1	200	13	12	13	12	12.5	625

Cell Division:

	% Divided
Stock 1+2	96.1
Stock 2	99.2
Stock 2.1	99.3

Stock 3 = 92 Stock 4 = 91

Selected Stock:	2.1
-----------------	-----

Stock Density
625
 500

Dil Factor
1.25

Adjust selected embryo stock to 500 embryos/mL.
 Dilution Factor = Stock Density/mL/500

In 10 mL sample volume add 500 μ L of 500 embryo/mL stock to obtain 25 embryos/mL in test vials.

Notes:

QL₂ = 256/278

T0₁ = 301, T0₂ = 285, T0₃ = 295, T0₄ = 286, T0₅ = 308 x = 295

QA Review:

AG 12/11/23

Final Review: ME 12/20/23

Water Quality for Bivalve Development

Client: WSP
 Project ID: RHMP 23' #4
 Test No. 23-09-047 to -063

Test Species: M. galloprovincialis
 Start Date/Time: 9/14/2023 1440
 End Date/Time: 9/16/2023 1300

Test Conc. (%)	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
LC #1	Temp. (°C)	15.7	15.2	15.3
	Salinity (ppt)	31.5	31.0	31.0
	pH (units)	7.62	7.44	7.55
	DO (mg/L)	7.7	7.5	7.8
LC #2	Temp. (°C)	15.9 14.9	14.9	15.2
	Salinity (ppt)	31.7	31.5	31.5 31.4
	pH (units)	7.60	7.53	7.57
	DO (mg/L)	7.4	7.9	8.0
B23-12117	Temp. (°C)	15.9	14.6	15.2
	Salinity (ppt)	31.6	31.9	32.2
	pH (units)	7.56	7.62	7.72
	DO (mg/L)	7.5	8.0	7.5
B23-12118	Temp. (°C)	14.9	14.6	15.2
	Salinity (ppt)	32.0	32.2	32.3
	pH (units)	7.74	7.65	7.75
	DO (mg/L)	7.9	8.1	7.5
B23-12119	Temp. (°C)	15.1	14.3	14.8
	Salinity (ppt)	31.8	32.3	32.6
	pH (units)	7.77	7.68	7.80
	DO (mg/L)	7.8	8.1	7.8
B23-12120	Temp. (°C)	14.8	14.1	14.8
	Salinity (ppt)	32.0	32.4	32.6
	pH (units)	7.62	7.66	7.76
	DO (mg/L)	7.9	8.2	8.0
B23-12114	Temp. (°C)	15.4	14.2	14.7
	Salinity (ppt)	31.8	32.3 32.5	32.7
	pH (units)	7.72	7.66	7.80
	DO (mg/L)	7.8	8.2	8.0
Tech Initials:		HW	RN	JF

Source of Animals: NWC/Mission Bay

Date Received: 9/13/23

Comments: _____

QC Check: AL 12/11/23

Final Review: ME 12/20/23

Water Quality for Bivalve Development

Client: WSP

Test Species: *M. galloprovincialis*

Project ID: RHMP 23' #4

Start Date/Time: 9/14/2023 1440

Test No. 23-09-047 to -063

End Date/Time: 9/16/2023 1300

Test Conc. (%)	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
B23-12115	Temp. (°C)	15.2	14.1	14.9
	Salinity (ppt)	31.8	32.0	32.86 ^{TF}
	pH (units)	7.67	7.73	7.87
	DO (mg/L)	7.7	8.2	8.0
B23-12009	Temp. (°C)	15.8	14.1	14.6
	Salinity (ppt)	31.9	32.3	32.4
	pH (units)	7.70	7.69	7.73
	DO (mg/L)	7.7	8.2	8.1
B23-12010	Temp. (°C)	15.5	14.1	14.7
	Salinity (ppt)	31.7	32.5	32.9
	pH (units)	7.69	7.66	7.76
	DO (mg/L)	7.7	8.2	8.0
B23-12011	Temp. (°C)	15.0	14.2	14.6
	Salinity (ppt)	31.9	32.5	33.4
	pH (units)	7.70	7.65	7.76
	DO (mg/L)	8.0	8.2	8.0
B23-12012	Temp. (°C)	15.1	14.1	14.5
	Salinity (ppt)	31.8	32.3	32.7
	pH (units)	7.71	7.66	7.77
	DO (mg/L)	7.7	8.2	8.1
B23-12099	Temp. (°C)	15.4	14.0	14.5
	Salinity (ppt)	31.7	32.4	33.0
	pH (units)	7.68	7.64	7.69
	DO (mg/L)	7.8	8.3	8.0
B23-12103	Temp. (°C)	15.4	14.0	14.4
	Salinity (ppt)	31.6	32.4	32.8
	pH (units)	7.68	7.64	7.72
	DO (mg/L)	7.8	8.3	8.1
Tech Initials:		HK	RV	JF

Source of Animals: NIWC / Mission Bay

Date Received: 9/13/23

Comments:

QC Check: 10/12/23

Final Review: MK 12/20/23

Water Quality for Bivalve Development

Client: WSP
 Project ID: RHMP 23' #4
 Test No. 23-09-047 to -063

Test Species: M. galloprovincialis
 Start Date/Time: 9/14/2023 1440
 End Date/Time: 9/16/2023 1300

Test Conc. (%)	Water Quality Measurements QC1			
	Parameter	0hr	24hr	48hr
B23-12107	Temp. (°C)	14.7	14.0	14.4
	Salinity (ppt)	31.8	32.2	32.4
	pH (units)	7.72	7.65	7.74
	DO (mg/L)	8.0	8.3	8.1
B23-12109	Temp. (°C)	15.4	14.0	14.3
	Salinity (ppt)	31.8	32.4	32.9
	pH (units)	7.71	7.64	7.72
	DO (mg/L)	7.9	8.3	8.2
B23-12110	Temp. (°C)	14.9	RV 14.0 13.9	14.3
	Salinity (ppt)	31.7	32.5	32.9
	pH (units)	7.73	7.66	7.73
	DO (mg/L)	7.9	8.3	8.1
B23-12155	Temp. (°C)	14.8	13.8	14.2
	Salinity (ppt)	31.7	32.5	32.8
	pH (units)	7.80	7.92	7.95
	DO (mg/L)	7.8	8.2	8.2
B23-12098	Temp. (°C)	14.84	13.8	14.0
	Salinity (ppt)	31.9	31.8	32.8
	pH (units)	7.68	7.62	7.79
	DO (mg/L)	8.0	8.0	8.3
	Temp. (°C)			
	Salinity (ppt)			
	pH (units)			
	DO (mg/L)			
	Temp. (°C)			
	Salinity (ppt)			
	pH (units)			
	DO (mg/L)			
Tech Initials:		HK	RN	JF

Source of Animals: NIWC/Mission Bay

Date Received: 9/13/23

Comments: _____

QC Check: AG 12/11/23

Final Review: ML 12/20/23

WSP
RHMP #4 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control #1	10 44 16 20 42
Lab Control #2	41 13 63 66 28
B23-12117	53 31 3 40 36
B23-12118	77 15 24 79 82
B23-12119	6 21 25 88 1
B23-12120	75 64 73 61 43
B23-12114	50 56 48 12 54

QC Check - Mussel: AB

WSP
RHMP #4 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12115	8 85 2 19 74
B23-12009	84 58 76 62 93
B23-12010	89 30 94 78 9
B23-12011	29 17 65 7 46
B23-12012	18 22 4 14 81
B23-12099	72 92 37 91 59
B23-12103	32 68 51 90 39

QC Check - Mussel: *AB*

WSP
RHMP #4 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12107	35 52 45 33 60
B23-12109	95 67 26 57 83
B23-12110	11 49 47 27 86
B23-12155	71 55 69 38 70
B23-12098	5 80 87 23 34

QC Check - Mussel: AK

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: M. galloprovincialis

Project ID: RHMP 23' #4

Start Date: 9/14/2023 1440

Test No.: 23-09-047 to 23-09-063

End Date: 9/16/2023 1300

DI Blank: 0.0

10 mg/L Ammonia Stock: 10.10

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃) (x1.22)	Notes
LC #1	0	1	<1	1.22	HK 10/18/23
LC #2	0	2	<1	1.22	
B23-12117	0	3	1.20	1.46	
B23-12118	0	4	<1	1.22	
B23-12119	0	5	1.57	1.92	
B23-12120	0	6	<1	1.22	
B23-12114	0	7	<1	4.22	
B23-12115	0	8	<1	1.22	
B23-12009	0	9	<1	1.22	
B23-12010	0	10	<1	1.22	
B23-12011	0	11	<1	1.22	
B23-12012	0	12	1.09	1.33	
B23-12099	0	13	<1	1.22	
B23-12103	0	14	<1	1.22	
B23-12107	0	15	<1	1.22	
B23-12109	0	16	<1	1.22	
B23-12110	0	17	<1	1.22	
B23-12155	0	18	3.28	4.00	
B23-12098	0	19	<1	1.22	
LC #1	2	20	<1	1.22	
LC #2	2	21	<1	1.22	
B23-12117	2	22	2.05	2.50	
B23-12118	2	23	1.62	1.98	
B23-12119	2	24	2.47	3.01	
B23-12120	2	25	<1	1.22	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments: HK 1

QC Check: MK 12/11/23

Final Review: MK 12/26/23

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: *M. galloprovincialis*

Project ID: RHMP 23' #41

Start Date: 9/14/2023 1440

Test No.: 23-09-047 to 23-09-063

End Date: 9/16/2023 1300

DI Blank: 0.0

10 mg/L Ammonia Stock: 10.10

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check: Mk 12/11/23

Final Review: AG 12/26/23

Unionized Ammonia Calculation for Pressure of 1 atm
Input 'Shaded' data

I	pK
1	9.26
2	9.27
3	9.28
4	9.29
5	9.30
6	9.32
7	9.33
8	9.34

Log Numbr Beaker	Day	Dilution			Total		Salinity (ppt)	pH	Temp (K)	i	i Rounded	pK
					Ammonia (mg/L)	Temp (C)						
Lab Control		0	0	<	1.22	15.7	31.5	7.62	288.86	6.98	7	9.33
B23-12117		0	0		1.46	15.9	31.6	7.56	289.06	7.00	7	9.33
B23-12118		0	0	<	1.22	14.9	32.0	7.74	288.06	7.09	7	9.33
B23-12119		0	0		1.92	15.1	31.8	7.77	288.26	7.05	7	9.33
B23-12120		0	0	<	1.22	14.8	32.0	7.62	287.96	7.09	7	9.33
B23-12114		0	0	<	1.22	15.4	31.8	7.72	288.56	7.05	7	9.33
B23-12115		0	0	<	1.22	15.2	31.8	7.67	288.36	7.05	7	9.33
B23-12009		0	0	<	1.22	15.8	31.9	7.70	288.96	7.07	7	9.33
B23-12010		0	0	<	1.22	15.5	31.7	7.69	288.66	7.02	7	9.33
B23-12011		0	0	<	1.22	15.0	31.9	7.70	288.16	7.07	7	9.33
B23-12012		0	0		1.33	15.1	31.8	7.71	288.26	7.05	7	9.33
B23-12099		0	0	<	1.22	15.4	31.7	7.68	288.56	7.02	7	9.33
B23-12103		0	0	<	1.22	15.4	31.6	7.68	288.56	7.00	7	9.33
B23-12107		0	0	<	1.22	14.7	31.8	7.72	287.86	7.05	7	9.33
B23-12109		0	0	<	1.22	15.4	31.8	7.71	288.56	7.05	7	9.33
B23-12110		0	0	<	1.22	14.9	31.7	7.73	288.06	7.02	7	9.33
B23-12155		0	0		4.00	14.8	31.7	7.80	287.96	7.02	7	9.33
B23-12098		0	0	<	1.22	14.4	31.9	7.68	287.56	7.07	7	9.33
Lab Control		2	0	<	1.22	15.3	31.0	7.55	288.46	6.88	7	9.33
B23-12117		2	0		2.50	15.2	32.2	7.72	288.36	7.13	7	9.33
B23-12118		2	0		1.98	15.2	32.3	7.75	288.36	7.15	7	9.33
B23-12119		2	0		3.01	14.8	32.6	7.80	287.96	7.22	7	9.33
B23-12120		2	0	<	1.22	14.8	32.6	7.76	287.96	7.22	7	9.33
B23-12114		2	0		1.37	14.7	32.7	7.80	287.86	7.24	7	9.33
B23-12115		2	0		4.14	14.9	32.6	7.87	288.06	7.22	7	9.33
B23-12009		2	0	<	1.22	14.6	32.4	7.73	287.76	7.17	7	9.33
B23-12010		2	0		1.28	14.7	32.9	7.76	287.86	7.28	7	9.33
B23-12011		2	0	<	1.22	14.6	33.4	7.76	287.76	7.39	7	9.33
B23-12012		2	0		2.64	14.5	32.7	7.77	287.66	7.24	7	9.33
B23-12099		2	0	<	1.22	14.5	33.0	7.69	287.66	7.30	7	9.33
B23-12103		2	0		1.24	14.4	32.8	7.72	287.56	7.26	7	9.33
B23-12107		2	0	<	1.22	14.4	32.4	7.74	287.56	7.17	7	9.33
B23-12109		2	0	<	1.22	14.3	32.9	7.72	287.46	7.28	7	9.33
B23-12110		2	0	<	1.22	14.3	32.9	7.73	287.46	7.28	7	9.33
B23-12155		2	0		6.12	14.2	32.8	7.95	287.36	7.26	7	9.33
B23-12098		2	0	<	1.22	14.0	32.8	7.79	287.16	7.26	7	9.33

Date Entered: MK 12/18/23
Data QC: AG 12/26/23

Bivalve Batch #5

9/20/23

48hr Bivalve Development Results

Client: WSP

Project ID: RHMP #5 SD Bay-South/Central

Species *Mytilus galloprovincialis*

Test No. 23-09-078 to 23-09-094

Sample ID	Rand #	# Initial Embryos	# Counted	# Normal	Combined % Normal-Alive	Mean Combined % Normal-Alive	% of Control
Lab Control	16	240	210	206	85.8	90.4	NA
	73	241	241	219	90.9		
	80	240	225	208	86.7		
	35	240	240	228	95.0		
	95	257	257	240	93.4		
B23-12093	7	240	236	221	92.1	82.1	90.9
	13	240	202	195	81.3		
	30	251	251	246	98.0		
	6	240	164	143	59.6		
	58	240	197	191	79.6		
B23-12095	48	240	229	216	90.0	86.4	95.6
	8	240	209	194	80.8		
	93	240	216	205	85.4		
	51	240	234	228	95.0		
	45	240	198	194	80.8		
B23-12096	75	241	241	232	96.3	88.3	97.7
	29	240	206	183	76.3		
	17	240	240	235	97.9		
	27	240	209	203	84.6		
	87	240	214	207	86.3		
B23-12097	89	264	264	244	92.4	85.5	94.6
	33	240	207	201	83.8		
	14	240	207	189	78.8		
	72	240	232	216	90.0		
	81	240	213	198	82.5		
B23-12102	5	240	219	207	86.3	88.3	97.8
	86	240	228	220	91.7		
	26	240	221	214	89.2		
	49	240	232	217	90.4		
	85	240	215	202	84.2		
B23-12091	92	240	191	182	75.8	79.1	87.5
	77	240	211	204	85.0		
	42	240	212	198	82.5		
	67	240	201	195	81.3		
	82	240	182	170	70.8		
B23-12003	79	240	220	205	85.4	90.9	100.6
	19	240	199	192	80.0		
	3	251	251	241	96.0		
	25	242	242	232	95.9		
	21	250	250	243	97.2		
B23-12089	69	240	218	207	86.3	89.5	99.1
	62	245	245	236	96.3		
	90	240	223	203	84.6		
	10	240	211	204	85.0		
	65	246	246	235	95.5		

B23-12090	54	273	273	253	92.7	92.0	101.8
	63	240	236	226	94.2		
	23	240	239	231	96.3		
	60	240	213	199	82.9		
	28	242	242	227	93.8		
B23-12004	1	240	198	190	79.2	82.9	91.8
	55	240	199	191	79.6		
	38	240	197	188	78.3		
	44	240	224	219	91.3		
	40	240	211	207	86.3		
B23-12045	56	240	231	220	91.7	78.4	86.7
	78	248	248	236	95.2		
	57	240	203	200	83.3		
	66	240	193	180	75.0		
	11	240	131	112	46.7		
B23-12046	91	240	240	230	95.8	86.5	95.7
	50	240	205	196	81.7		
	70	240	207	193	80.4		
	34	240	239	234	97.5		
	68	240	209	185	77.1		
B23-12006	15	240	226	218	90.8	85.1	94.2
	74	240	211	206	85.8		
	31	240	207	197	82.1		
	36	240	196	193	80.4		
	59	240	215	207	86.3		
B23-12007	52	240	210	195	81.3	85.0	94.1
	4	240	234	225	93.8		
	83	240	188	165	68.8		
	84	240	223	209	87.1		
	12	240	234	226	94.2		
B23-12008	37	240	200	192	80.0	84.2	93.2
	18	240	238	224	93.3		
	2	240	195	183	76.3		
	76	240	218	210	87.5		
	22	240	217	201	83.8		
B23-12151	47	240	219	211	87.9	85.4	94.6
	64	240	185	172	71.7		
	39	240	225	216	90.0		
	32	240	203	198	82.5		
	9	243	243	231	95.1		
B23-12152	71	240	240	224	93.3	92.8	102.7
	53	240	237	224	93.3		
	88	240	224	210	87.5		
	43	248	248	242	97.6		
	61	250	250	231	92.4		

Notes: **Bold** indicates statistically significant difference; (*) indicates replicate considered an outlier using Grubbs outlier test (poor recovery during termination and heavy debris observed)

Data Entered: JF 12/16/23

QC Check: AG 1/19/24

Final Review: MSK

WSP Environmental Lab, 4905 Morena Blvd, Ste. 1304, San Diego, CA 92117

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column B	B23-12093
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1428
9	P value summary	ns
10	Significantly different (P < 0.05)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=1.208, df=4.599
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column B	82.12
17	Difference between means (B - A) $\pm$ SEM	-8.240 $\pm$ 6.823
18	95% confidence interval	-26.25 to 9.770
19	R squared (eta squared)	0.2407
20		
21	F test to compare variances	
22	F, DFn, Dfd	13.27, 4, 4
23	P value	0.0281
24	P value summary	*
25	Significantly different (P < 0.05)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column B	5

Final Results

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column C	B23-12095
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1338
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.205$, $df=6.918$
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column C	86.40
17	Difference between means (C - A) $\pm$ SEM	-3.960 ± 3.286
18	95% confidence interval	-11.75 to 3.828
19	R squared (eta squared)	0.1736
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.309, 4, 4
23	P value	0.4377
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column C	5

Final Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column D	B23-12096
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.3338
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.4531$, $df=5.547$
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column D	88.36
17	Difference between means ($D - A$) $\pm$ SEM	-2.000 ± 4.414
18	95% confidence interval	-13.02 to 9.018
19	R squared (eta squared)	0.03569
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.971, 4, 4
23	P value	0.1495
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column D	5

Fungal Review: 55

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column E	B23-12097
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0785
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.577$, $df=7.287$
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column E	85.50
17	Difference between means (E - A) $\pm$ SEM	-4.860 ± 3.081
18	95% confidence interval	-12.09 to 2.368
19	R squared (eta squared)	0.2545
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.910, 4, 4
23	P value	0.5462
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column E	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column F	B23-12102
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.2026
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.8821$, $df=7.459$
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column F	88.36
17	Difference between means ($F - A$) $\pm$ SEM	-2.000 ± 2.267
18	95% confidence interval	-7.295 to 3.295
19	R squared (eta squared)	0.09445
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.737, 4, 4
23	P value	0.6060
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column F	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column G	B23-12091
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0042
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=3.601, df=7.193
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column G	79.08
17	Difference between means (G - A) $\pm$ SEM	-11.28 $\pm$ 3.132
18	95% confidence interval	-18.65 to -3.913
19	R squared (eta squared)	0.6432
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.007, 4, 4
23	P value	0.5163
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column G	5

Final Review 59

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column H	B23-12003
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.4473
9	P value summary	ns
10	Significantly different (P < 0.05)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=0.1383, df=6.027
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column H	90.90
17	Difference between means (H - A) $\pm$ SEM	0.5400 $\pm$ 3.905
18	95% confidence interval	-9.005 to 10.09
19	R squared (eta squared)	0.003162
20		
21	F test to compare variances	
22	F, DFn, Dfd	3.674, 4, 4
23	P value	0.2354
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column H	5

Final Review JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column I	B23-12089
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.4018
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=0.2580$, $df=7.110$
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column I	89.54
17	Difference between means ($I - A$) $\pm$ SEM	-0.8200 ± 3.178
18	95% confidence interval	-8.311 to 6.671
19	R squared (eta squared)	0.009278
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.095, 4, 4
23	P value	0.4913
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column I	5

Final Review SS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column J	B23-12090
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.3000
9	P value summary	ns
10	Significantly different (P < 0.05)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=0.5475, df=7.512
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column J	91.98
17	Difference between means (J - A) $\pm$ SEM	1.620 $\pm$ 2.959
18	95% confidence interval	-5.281 to 8.521
19	R squared (eta squared)	0.03837
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.684, 4, 4
23	P value	0.6261
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column J	5

Final Review: 58

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column K	B23-12004
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0236
9	P value summary	*
10	Significantly different ($P < 0.05$)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=2.388$, $df=7.239$
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column K	82.94
17	Difference between means ($K - A$) $\pm$ SEM	-7.420 ± 3.107
18	95% confidence interval	-14.72 to -0.1214
19	R squared (eta squared)	0.4406
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.959, 4, 4
23	P value	0.5308
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column K	5

Fungal Review: 57

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column M	B23-12046
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.2179
9	P value summary	ns
10	Significantly different (P < 0.05)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=0.8410, df=5.418
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column M	86.50
17	Difference between means (M - A) $\pm$ SEM	-3.860 $\pm$ 4.590
18	95% confidence interval	-15.39 to 7.670
19	R squared (eta squared)	0.1155
20		
21	F test to compare variances	
22	F, DFn, Dfd	5.457, 4, 4
23	P value	0.1290
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column M	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column N	B23-12006
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0364
9	P value summary	*
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=2.065, df=8.000
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column N	85.08
17	Difference between means (N - A) $\pm$ SEM	-5.280 $\pm$ 2.557
18	95% confidence interval	-11.18 to 0.6163
19	R squared (eta squared)	0.3477
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.004, 4, 4
23	P value	0.9971
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column N	5

Final Review: 5

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column O	B23-12007
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1690
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.056$, $df=5.154$
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column O	85.04
17	Difference between means (O - A) $\pm$ SEM	-5.320 ± 5.039
18	95% confidence interval	-18.16 to 7.518
19	R squared (eta squared)	0.1778
20		
21	F test to compare variances	
22	F, DFn, Dfd	6.783, 4, 4
23	P value	0.0906
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column O	5

Fungal Review JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column P	B23-12008
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.0597
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.787$, $df=6.631$
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column P	84.18
17	Difference between means ($P - A$) $\pm$ SEM	-6.180 ± 3.458
18	95% confidence interval	-14.45 to 2.090
19	R squared (eta squared)	0.3251
20		
21	F test to compare variances	
22	F, DFn, Dfd	2.665, 4, 4
23	P value	0.3654
24	P value summary	ns
25	Significantly different ($P < 0.05$)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column P	5

Final Review: JS

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column Q	B23-12151
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1534
9	P value summary	ns
10	Significantly different (P < 0.05)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=1.125, df=5.577
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column Q	85.44
17	Difference between means (Q - A) $\pm$ SEM	-4.920 $\pm$ 4.375
18	95% confidence interval	-15.83 to 5.986
19	R squared (eta squared)	0.1848
20		
21	F test to compare variances	
22	F, DFn, Dfd	4.867, 4, 4
23	P value	0.1545
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column Q	5

Final Review: T7

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column R	B23-12152
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1697
9	P value summary	ns
10	Significantly different (P < 0.05)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	t=1.017, df=7.896
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column R	92.82
17	Difference between means (R - A) $\pm$ SEM	2.460 $\pm$ 2.419
18	95% confidence interval	-3.131 to 8.051
19	R squared (eta squared)	0.1158
20		
21	F test to compare variances	
22	F, DFn, Dfd	1.260, 4, 4
23	P value	0.8282
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column R	5

Fungal Review: 39

Welch's t test Tabular results		
1	Table Analyzed	RHMP 5 9.20.23
2		
3	Column L	B23-12045
4	vs.	vs.
5	Column A	Lab Control
6		
7	Unpaired t test with Welch's correction	
8	P value	0.1209
9	P value summary	ns
10	Significantly different ($P < 0.05$)?	No
11	One- or two-tailed P value?	One-tailed
12	Welch-corrected t, df	$t=1.354$, $df=4.347$
13		
14	How big is the difference?	
15	Mean of column A	90.36
16	Mean of column L	78.38
17	Difference between means (L - A) $\pm$ SEM	-11.98 ± 8.845
18	95% confidence interval	-35.78 to 11.82
19	R squared (eta squared)	0.2967
20		
21	F test to compare variances	
22	F, DFn, Dfd	22.98, 4, 4
23	P value	0.0101
24	P value summary	*
25	Significantly different ($P < 0.05$)?	Yes
26		
27	Data analyzed	
28	Sample size, column A	5
29	Sample size, column L	5

Final Review 75

Embryo-Larval Development Test

Stock Preparation Worksheet

Test Species: M. galloprovincialis
 Batch ID: Wsp stored, NIWC stored
 Test Type: Mg-SWI

Test Date: 9/20/2023
 Analyst: AL

Task	
Spawning Induction	1020
Spawning Begins	1125
# Males/# Females	5/2
Spawn Condition	good
Fertilization Initiated	1230
Fertilization End/Eggs Rinsed	1300/1320
Embryo Counts	1430
Test Initiation	1515

Embryo Density Counts

per 100 μ L

Stock #	Stock Volume (mL)	Rep 1	Rep 2	Rep 3	Rep 4	Mean #/100 μ L	Mean #/mL (x20)50
Stock 1	250	12	15	18	15	15	750
Stock 21.1	250	10	10	12	11	10.75	537.5
Stock 2	250	13	11	12	15	12.75	637.5

Cell Division:

	% Divided
Stock 1	100
Stock 21.1	100
Stock 2	100

Selected Stock:	2
-----------------	---

Adjust selected embryo stock to 500 embryos/mL.
 Dilution Factor = Stock Density/mL/500

Stock Density
637.5
 500

Dil Factor
1.28

In 10 mL sample volume add 500 μ L of 500 embryo/mL stock to obtain 25 embryos/mL in test vials.

Notes: QC2 = 225/252

T01 = 243, T02 = 246, T03 = 221, T04 = 234, T05 = 255

QA Review: JF 12/15/23

X = 240

Final Review: AL 12/27/23

Water Quality for Bivalve Development

Client: WSP

Test Species: *M. galloprovincialis*

Project ID: RHMP 2023 #5

Start Date/Time: 9/20/2023 1515

Test No. 23-09-078 to -094

End Date/Time: 9/22/2023 1400

Sample ID	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
Lab Control #1	Temp. (°C)	14.2	15.6	15.3
	Salinity (ppt)	32.2	31.4	32.4
	pH (units)	7.68	7.43	7.54
	DO (mg/L)	7.5	7.9	7.6
Lab Control #2	Temp. (°C)	14.0	15.2	15.2
	Salinity (ppt)	32.4	31.7	32.0
	pH (units)	7.69	7.49	7.52
	DO (mg/L)	8.0	8.0	8.0
B23-12093	Temp. (°C)	14.0	14.6	14.5
	Salinity (ppt)	32.6	32.8	33.6
	pH (units)	7.72	7.55	7.62
	DO (mg/L)	8.0	8.1	8.0
B23-12095	Temp. (°C)	14.0	14.3	14.3
	Salinity (ppt)	32.5	32.7	33.2
	pH (units)	7.72	7.58	7.68
	DO (mg/L)	8.0	8.2	8.1
B23-12096	Temp. (°C)	14.4	14.3	14.2
	Salinity (ppt)	32.3	32.9	33.2
	pH (units)	7.70	7.58	7.65
	DO (mg/L)	7.8	8.2	8.1
B23-12097	Temp. (°C)	14.3	14.2	14.0
	Salinity (ppt)	32.3	32.9	33.6
	pH (units)	7.71	7.60	7.68
	DO (mg/L)	7.9	8.2	8.2
B23-12102	Temp. (°C)	14.4	14.1	14.0
	Salinity (ppt)	32.2	32.3	33.2
	pH (units)	7.68	7.61	7.68
	DO (mg/L)	7.8	8.2	8.3
Tech Initials:		RJ/MK	RJ	JF

Source of Animals: NWC/Mission Bay

Date Received: 9/14/23

Comments:

QC Check: JF 12/15/23

Final Review: JF 12/27/23

Water Quality for Bivalve Development

Client: WSP
Project ID: RHMP 2023 #5
Test No. 23-09-078 to -094

Test Species: *M. galloprovincialis*
Start Date/Time: 9/20/2023 1515
End Date/Time: 9/22/2023 1400

Sample ID	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
B23-12091	Temp. (°C)	14.0	14.1	14.2
	Salinity (ppt)	32.5	33.1	33.6
	pH (units)	7.72	7.61	7.64
	DO (mg/L)	8.2 8.2	8.2	8.2
B23-12003	Temp. (°C)	14.0	14.2	14.4
	Salinity (ppt)	32.5	33.0	32.9
	pH (units)	7.73	7.64	7.52
	DO (mg/L)	8.1	8.2	8.0
B23-12089	Temp. (°C)	14.0	14.1	14.3
	Salinity (ppt)	32.6	33.2	33.6
	pH (units)	7.73	7.63	7.54
	DO (mg/L)	8.2	8.3	8.1
B23-12090	Temp. (°C)	14.0	14.1	14.1
	Salinity (ppt)	32.3	33.21	33.5
	pH (units)	7.72	7.63	7.62
	DO (mg/L)	8.1	8.3	8.1
B23-12004	Temp. (°C)	14.0	14.1	14.1
	Salinity (ppt)	32.6	33.2	33.4
	pH (units)	7.69	7.63	7.63
	DO (mg/L)	8.0	8.3	8.2
B23-12045	Temp. (°C)	14.0	13.9	14.0
	Salinity (ppt)	32.4	33.3	33.4
	pH (units)	7.69	7.61	7.63
	DO (mg/L)	8.0	8.3	8.2
B23-12046	Temp. (°C)	14.0	13.9	13.7
	Salinity (ppt)	32.1	33.4	33.4
	pH (units)	7.73	7.63	7.64
	DO (mg/L)	8.1	8.4	8.3
Tech Initials:		RV/MK	RV	JF

Source of Animals: NIWL / Mission Bay

Date Received: 9/19/23

Comments:

QC Check: JF 12/15/23

Final Review: AL 12/27/23

Water Quality for Bivalve Development

Client: WSP

Test Species: *M. galloprovincialis*

Project ID: RHMP 2023 #5

Start Date/Time: 9/20/2023 1515

Test No. 23-09-078 to -094

End Date/Time: 9/22/2023 1400

Sample ID	Water Quality Measurements			
	Parameter	QC1 0hr	24hr	48hr
B23-12006	Temp. (°C)	14.0	13.8	14.0
	Salinity (ppt)	32.4	33.2	33.8
	pH (units)	7.68	7.61	7.59
	DO (mg/L)	8.1	8.3	8.2
B23-12007	Temp. (°C)	14.0	13.8	14.0
	Salinity (ppt)	32.3	32.4	33.7
	pH (units)	7.71	7.63	7.61
	DO (mg/L)	8.2	8.3	8.2
B23-12008	Temp. (°C)	14.3	13.8	13.9
	Salinity (ppt)	32.1	33.5	33.8
	pH (units)	7.72	7.65	7.62
	DO (mg/L)	8.1	8.3	8.2
B23-12151	Temp. (°C)	13.2	13.8	13.9
	Salinity (ppt)	32.5	33.0	33.9 34.0
	pH (units)	7.70	7.64	7.61
	DO (mg/L)	8.0	8.3	8.2
B23-12152	Temp. (°C)	13.8	13.7	13.8
	Salinity (ppt)	32.2	33.3	34.0
	pH (units)	7.70	7.64	7.65
	DO (mg/L)	8.1	8.4	8.3
	Temp. (°C)			
	Salinity (ppt)			
	pH (units)			
	DO (mg/L)			
	Temp. (°C)			
	Salinity (ppt)			
	pH (units)			
	DO (mg/L)			
Tech Initials:		RJ/MK	RJ	JF

Source of Animals: NWL/Mission Bay

Date Received: 9/19/23

Comments:

QC Check: JF 12/15/23

Final Review: AG 12/27/23

Embryo-Larval Development Test Scoring Worksheet

Client: WSP
Project ID: RHMP 2023 #5
Test No.: 23-09-078 to -094

Test Species: *M. galloprovincialis*
Start Date: 9/20/2022 1515
End Date: 9/22/2023 1400

Random #	# Counted	# Normal	Tech Initials	Notes
1	198	190	BF	Lot of debris 11/10/23
2	195	183		light debris
3	251	241		
4	234	225		
5	219	207		
6	164	143		11/13/23
7	236	221		
8	209	194		
9	243	231		
10	211	204		
11	131	112		
12	234	226		
13	202	195		
14	207	189		
15	226	218		
16	210	206		
17	240	235		
18	238	224		
19	199	192		
20	218	213		
21	250	243		11/17/23
22	217	201		
23	239	231		
24	227	218		
25	242	232		
26	221	214		
27	209	203		
28	242	227		
29	206	183		
30	251	246		
31	207	197		
32	203	198		11/18/23
33	207	201		
34	239	234		
35	240	228		
36	196	193		
37	200	192		
38	197	188		
39	225	216		
40	211	207		

QC Check: 38 12/15/23

Final Review: AB 12/27/23

Embryo-Larval Development Test Scoring Worksheet

Client: WSP
Project ID: RHMP 2023 #5
Test No.: 23-09-078.40-094

Test Species: *M. galloprovincialis*
Start Date: 9/20/2023 1515
End Date: 9/22/2023 1400

Random #	# Counted	# Normal	Tech Initials	Notes
41	210	202	BE	11/18/23
42	212	198		
43	243	242		11/22/23
44	224	219		
45	198	194		
46	234	228		
47	219	211		
48	229	216		
49	232	217		
50	205	196		
51	234	228		
52	210	195		
53	237	224		
54	273	253		11/25/23
55	199	191		
56	231	220		
57	203	200		
58	197	191		
59	215	207		
60	213	199		
61	250	231		
62	245	236		
63	236	226		11/27/23
64	185	172		
65	246	235		
66	193	180		
67	201	195		
68	209	185		
69	218	207		
70	207	193		
71	240	224		
72	232	216		
73	241	219		
74	211	206		
75	241	232		
76	218	210		11/29/23
77	211	204		
78	248	236		
79	220	205		
80	225	208		

QC Check: JF 12/15/23

Final Review: AB 12/27/23

Embryo-Larval Development Test Scoring Worksheet

Client: WSP

Project ID: RHMP 2023 #5

Test No.: 23-09-078 to -094

Test Species: *M. galloprovincialis*

Start Date: 9/20/2023 1515

End Date: 9/22/2023 1400

[illegible]

QC Check: JF 12/15/23

Final Review: Ab 12/27/23

**WSP
RHMP #5 Sediment Testing
Random Numbers**

SAMPLE ID	Rand#
B23-12091	92
	77
	42
	67
	82
B23-12003	79
	19
	3
	25
B23-12089	21
	69
	62
	90
	10
B23-12090	65
	54
	63
	23
	60
B23-12004	28
	1
	55
	38
	44
B23-12045	40
	56
	78
	57
	66
B23-12046	11
	91
	50
	70
	34
	68

QC Check - Mussel: AB/MK

WSP
RHMP #5 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
B23-12006	15 74 31 36 59
B23-12007	52 4 83 84 12
B23-12008	37 18 2 76 22
B23-12151	47 64 39 32 9
B23-12152	71 53 88 43 61

QC Check - Mussel: AB/MK

WSP
RHMP #5 Sediment Testing
Random Numbers

SAMPLE ID	Rand#
Lab Control #1	16 73 80 35 95
Lab Control #2	24 94 20 41 46
B23-12093	7 13 30 6 58
B23-12095	48 8 93 51 45
B23-12096	75 29 17 27 87
B23-12097	89 33 14 72 81
B23-12102	5 86 26 49 85

QC Check - Mussel: AG/MK

Ammonia Subsample Analysis - Overlying Water

Client: WSP
 Project ID: RHMP 2023 #5
 Test No.: 23-09-078 to -094
 DI Blank: 0.0

Test Species: M. galloprovincialis
 Start Date: 9/20/2023 1515
 End Date: 9/22/2023 1400

10 mg/L Ammonia Stock: 9.28

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃)	Notes
Lab Control #1	0	1	<1	<1.22	HW 11/3/23
Lab Control #2	0	2	<1	<1.22	
B23-12093	0	3	<1	<1.22	
B23-12095	0	4	<1	<1.22	
B23-12096	0	5	<1	<1.22	
B23-12097	0	6	<1	<1.22	
B23-12102	0	7	<1	<1.22	
B23-12091	0	8	<1	<1.22	
B23-12003	0	9	<1	<1.22	
B23-12089	0	10	<1	<1.22	
B23-12090	0	11	HW 1.06	HW 2.03	
B23-12004	0	12	<1	<1.22	
B23-12045	0	13	<1	<1.22	
B23-12046	0	14	<1	<1.22	
B23-12006	0	15	<1	<1.22	
B23-12007	0	16	<1	<1.22	
B23-12008	0	17	HW 1.04	1.27	
B23-12151	0	18	<1	<1.22	
B23-12152	0	19	<1	<1.22	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments: 1.06

QC Check: JF 12/15/23

Final Review: AB 12/27/23

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Project ID: RHMP 2023 #5

Test No.: 23-09-078 to -094

Test Species: M. galloprovincialis

Start Date: 9/20/2023 1575

End Date: 9/22/2023 1406

DI Blank: 0

10 mg/L Ammonia Stock: 9.2

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃) (x1.22)	Notes
Lab Control #1	2	20	<1	<1.22	HK 10/27/23
Lab Control #2	2	21	<1	<1.22	
B23-12093	2	22	<1	<1.22	
B23-12095	2	23	<1	<1.22	
B23-12096	2	24	<1	<1.22	
B23-12097	2	25	1.02	1.24	
B23-12102	2	26	<1	<1.22	
B23-12091	2	27	<1	<1.22	
B23-12003	2	28	1.18	1.44	
B23-12089	2	29	1.10	1.34	
B23-12090	2	30	3.11	3.79	
B23-12004	2	31	1.11	1.35	
B23-12045	2	32	<1	<1.22	
B23-12046	2	33	1.11	1.35	
B23-12006	2	34	<1	<1.22	
B23-12007	2	35	1.47	1.79	
B23-12008	2	36	1.93	2.35	
B23-12151	2	37	1.04	1.27	
B23-12152	2	38	<1	<1.22	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments: 1

QC Check: JF 12/15/23

Final Review: AL 12/27/23

Unionized Ammonia Calculation for Pressure of 1 atm
Input 'Shaded' data

I	pK
1	9.26
2	9.27
3	9.28
4	9.29
5	9.3
6	9.32
7	9.33
8	9.34

Log Number	Beal Day	Dilution		Total Amm	Temp (C)	Salinity (ppt)	pH	Temp (K)	I	IRounded	pK	Unionized , D.O. (mg/L)	Beaker Nu
Lab Control	0	0	<	1.22	14.2	32.2	7.68	287.36	7.131224	7	9.33	0.012221	0
B23-12093	0	0	<	1.22	14	32.6	7.72	287.16	7.216391	7	9.33	0.013191	0
B23-12095	0	0	<	1.22	14	32.5	7.72	287.16	7.195092	7	9.33	0.013191	0
B23-12096	0	0	<	1.22	14.4	32.3	7.7	287.56	7.152509	7	9.33	0.012981	0
B23-12097	0	0	<	1.22	14.3	32.3	7.71	287.46	7.152509	7	9.33	0.013183	0
B23-12102	0	0	<	1.22	14.4	32.2	7.68	287.56	7.131224	7	9.33	0.012403	0
B23-12091	0	0	<	1.22	14	32.5	7.72	287.16	7.195092	7	9.33	0.013191	0
B23-12003	0	0	<	1.22	14	32.5	7.73	287.16	7.195092	7	9.33	0.013495	0
B23-12089	0	0	<	1.22	14	32.6	7.73	287.16	7.216391	7	9.33	0.013495	0
B23-12090	0	0		2.03	14	32.3	7.72	287.16	7.152509	7	9.33	0.021949	0
B23-12004	0	0	<	1.22	14	32.6	7.69	287.16	7.216391	7	9.33	0.012319	0
B23-12045	0	0	<	1.22	14	32.4	7.69	287.16	7.173799	7	9.33	0.012319	0
B23-12046	0	0	<	1.22	14	32.1	7.73	287.16	7.109944	7	9.33	0.013495	0
B23-12006	0	0	<	1.22	14	32.4	7.68	287.16	7.173799	7	9.33	0.012042	0
B23-12007	0	0	<	1.22	14	32.3	7.71	287.16	7.152509	7	9.33	0.012894	0
B23-12008	0	0		1.27	14.3	32.1	7.72	287.46	7.109944	7	9.33	0.014039	0
B23-12151	0	0	<	1.22	13.2	32.5	7.7	286.36	7.195092	7	9.33	0.01188	0
B23-12152	0	0	<	1.22	13.8	32.2	7.7	286.96	7.131224	7	9.33	0.012419	0
Lab Control	2	0	<	1.22	15.3	32.4	7.54	288.46	7.173799	7	9.33	0.009631	0
B23-12093	2	0	<	1.22	14.5	33.6	7.62	287.66	7.429616	7	9.33	0.010897	0
B23-12095	2	0	<	1.22	14.3	33.2	7.68	287.46	7.344273	7	9.33	0.012312	0
B23-12096	2	0	<	1.22	14.2	33.2	7.65	287.36	7.344273	7	9.33	0.011413	0
B23-12097	2	0		1.24	14	33.6	7.68	287.16	7.429616	7	9.33	0.012239	0
B23-12102	2	0	<	1.22	14	33.2	7.68	287.16	7.344273	7	9.33	0.012042	0
B23-12091	2	0	<	1.22	14.2	33.6	7.64	287.36	7.429616	7	9.33	0.011156	0
B23-12003	2	0		1.44	14.4	32.9	7.52	287.56	7.280312	7	9.33	0.01016	0
B23-12089	2	0		1.34	14.3	33.6	7.54	287.46	7.429616	7	9.33	0.009824	0
B23-12090	2	0		3.79	14.1	33.5	7.62	287.26	7.408274	7	9.33	0.032865	0
B23-12004	2	0		1.35	14.1	33.4	7.63	287.26	7.386936	7	9.33	0.011977	0
B23-12045	2	0	<	1.22	14	33.4	7.63	287.16	7.386936	7	9.33	0.010744	0
B23-12046	2	0		1.35	13.9	33.4	7.64	287.06	7.386936	7	9.33	0.012073	0
B23-12006	2	0	<	1.22	14	33.8	7.59	287.16	7.472315	7	9.33	0.009806	0
B23-12007	2	0		1.79	14	33.7	7.61	287.16	7.450963	7	9.33	0.01506	0
B23-12008	2	0		2.35	13.9	33.8	7.62	287.06	7.472315	7	9.33	0.020079	0
B23-12151	2	0		1.27	13.9	34	7.61	287.06	7.515031	8	9.34	0.010367	0
B23-12152	2	0	<	1.22	13.8	34	7.65	286.96	7.515031	8	9.34	0.01083	0

Date Entered: JF 12/16/23
Data QC: AG 12/27/23

2023 RHMP DRAFT Sediment Quality Objectives (SQO) Assessment
Toxicity - Bivalve Sediment Water Interface Test

Harbor	Stratum	Station ID	Control Combined % Normal and Alive					Sample Combined % Normal and Alive					Mean Control Combined % Normal and Alive	Mean Sample Combined % Normal and Alive	% of Control	t-test (unequal variance)	Significant?	Avg
			Rep A	Rep B	Rep C	Rep D	Rep E	Rep A	Rep B	Rep C	Rep D	Rep E						
Dana Point Harbor	Marina	823-12063	88.2	90.2	93.1	95.8	95.8	85.0	78.0	92.9	84.6	86.2	92.6	85.4	92.2		Yes	
	Deep	823-12064	88.2	90.2	93.1	95.8	95.8	89.8	84.3	84.3	87.8	83.1	92.6	85.8	92.7		Yes	
	Marina	823-12065	88.2	90.2	93.1	95.8	95.8	86.6	78.3	81.9	89.8	78.7	92.6	83.1	89.7		Yes	
	Marina	823-12066	88.2	90.2	93.1	95.8	95.8	79.9	89.8	87.8	90.2	78.0	92.6	85.1	91.9		Yes	
Oceanside Harbor	Marina	823-12059	88.2	90.2	93.1	95.8	95.8	88.2	94.9	87.8	93.3	89.4	92.6	90.7	98.0		No	
	Deep	823-12060	88.2	90.2	93.1	95.8	95.8	85.8	90.6	84.3	87.4	79.9	92.6	85.6	92.4		Yes	
	FW-Influenced	823-12061	88.2	90.2	93.1	95.8	95.8	81.5	90.9	82.7	89.4	83.1	92.6	85.5	92.3		Yes	
	Marina	823-12062	88.2	90.2	93.1	95.8	95.8	91.3	90.2	78.7	93.3	87.0	92.6	88.1	95.1		No	
Mission Bay	Deep	823-12022	88.2	90.2	93.1	95.8	95.8	87.8	78.0	81.1	86.2	86.2	92.6	83.9	90.6		Yes	
	Shallow	823-12023	88.2	90.2	93.1	95.8	95.8	76.0	78.3	83.1	90.9	73.2	92.6	80.3	86.7		Yes	
	Shallow	823-12024	88.2	90.2	93.1	95.8	95.8	80.7	88.6	77.6	82.7	81.5	92.6	82.2	88.8		Yes	
	FW-Influenced	823-12025	88.2	90.2	93.1	95.8	95.8	83.1	92.1	77.2	90.9	77.2	92.6	84.1	90.8		Yes	
San Diego Bay - North	FW-Influenced	823-12026	88.2	90.2	93.1	95.8	95.8	83.1	82.3	81.1	0.0	77.6	92.6	81.0	87.5		Yes	
	Deep	823-12055	88.2	90.2	93.1	95.8	95.8	87.0	81.1	54.7	76.8	75.6	92.6	75.0	81.0		Yes	
	Marina	823-12056	88.2	90.2	93.1	95.8	95.8	79.1	95.4	29.5	86.2	87.8	92.6	87.1	94.1		No	
	Marina	823-12057	88.2	90.2	93.1	95.8	95.8	84.3	85.4	79.1	94.9	73.2	92.6	83.4	90.0		Yes	
	Shallow	823-12058	88.2	90.2	93.1	95.8	95.8	90.9	74.8	87.0	22.0	83.9	92.6	84.2	90.9		Yes	
	Deep	823-12014	94.0	86.1	83.5	83.8	94.7	65.0	74.1	90.6	78.9	92.5	88.4	80.2	90.7		No	
	Deep	823-12019	94.0	86.1	83.5	83.8	94.7	88.7	65.8	68.4	83.1	90.2	88.4	79.2	89.6		No	
	Deep	823-12020	94.0	86.1	83.5	83.8	94.7	74.8	91.4	70.3	64.3	63.2	88.4	72.8	82.3		Yes	
	Deep	823-12021	94.0	86.1	83.5	83.8	94.7	71.8	78.9	83.8	88.3	74.4	88.4	79.5	89.9		Yes	
	Marina	823-12047	94.0	86.1	83.5	83.8	94.7	93.4	74.8	69.5	83.5	82.7	88.4	80.8	91.4		No	
	Marina	823-12048	94.0	86.1	83.5	83.8	94.7	82.7	86.5	91.6	83.1	81.2	88.4	85.0	96.1		No	
	Marina	823-12049	94.0	86.1	83.5	83.8	94.7	69.2	72.6	62.4	81.2	74.8	88.4	72.0	81.5		Yes	
San Diego Bay - Central	Marina	823-12050	94.0	86.1	83.5	83.8	94.7	79.7	84.2	75.9	80.5	85.7	88.4	81.2	91.8		Yes	
	Marina	823-12051	94.0	86.1	83.5	83.8	94.7	70.7	85.3	78.6	74.4	88.7	88.4	79.5	90.0		Yes	
	Shallow	823-12052	94.0	86.1	83.5	83.8	94.7	78.9	71.4	89.5	91.4	0.0	88.4	82.8	93.7		No	
	Marina	823-12053	94.0	86.1	83.5	83.8	94.7	59.8	75.2	53.8	72.6	55.6	88.4	63.4	71.7		Yes	
	Shallow	823-12054	94.0	86.1	83.5	83.8	94.7	79.7	83.1	75.2	68.4	75.9	88.4	76.5	86.5		Yes	
	Deep	823-12116	94.0	86.1	83.5	83.8	94.7	82.0	92.9	93.2	76.7	83.5	88.4	85.6	96.8		No	
	Deep	823-12117	90.5	93.9	93.6	89.2	80.3	76.9	80.7	80.7	86.8	80	89.5	81	90.5		Yes	
	Industrial/Port	823-12118	90.5	93.9	93.6	89.2	80.3	80.7	87.1	65.4	75.6	69.5	89.5	75.7	84.5		Yes	
	Industrial/Port	823-12119	90.5	93.9	93.6	89.2	80.3	80	86.8	64.4	81	82.4	89.5	78.9	88.2		Yes	
	Industrial/Port	823-12120	90.5	93.9	93.6	89.2	80.3	84.7	83.1	75.9	87.8	84.1	89.5	83.1	92.9		Yes	
	Shallow	823-12121	94.0	86.1	83.5	83.8	94.7	66.9	75.2	66.2	72.2	85.0	88.4	73.1	82.7		Yes	
	Deep	823-12122	94.0	86.1	83.5	83.8	94.7	65.4	59.0	82.3	68.0	80.1	88.4	71.0	80.3		Yes	
	Shallow	823-12123	94.0	86.1	83.5	83.8	94.7	83.5	76.7	74.4	81.6	89.5	88.4	81.1	91.8		Yes	
	Deep	823-12124	94.0	86.1	83.5	83.8	94.7	86.5	73.3	96.6	74.4	68.8	88.4	79.9	90.4		No	
	Marina	823-12841	94.0	86.1	83.5	83.8	94.7	85.7	77.8	74.8	82.7	69.2	88.4	78.0	88.3		Yes	
	Shallow	823-12009	90.5	93.9	93.6	89.2	80.3	81.4	73.9	81.0	74.6	81.0	89.5	78.4	87.6		Yes	
	Shallow	823-12010	90.5	93.9	93.6	89.2	80.3	69.8	80.3	90.2	77.3	87.8	89.5	81.1	90.6		Yes	
	Shallow	823-12011	90.5	93.9	93.6	89.2	80.3	87.8	80.3	86.4	92.5	89.5	89.5	87.3	97.6		No	
	Deep	823-12012	90.5	93.9	93.6	89.2	80.3	89.5	75.6	81.0	84.7	74.6	89.5	81.1	90.6		Yes	
	Deep	823-12089	85.8	90.9	86.7	95.0	93.4	86.3	96.3	84.6	85.0	95.5	90.4	89.5	99.1		No	
Industrial/Port	823-12090	85.8	90.9	86.7	95.0	93.4	92.7	94.2	96.3	82.9	93.8	90.4	92.0	102		No		
Industrial/Port	823-12091	85.8	90.9	86.7	95.0	93.4	75.8	85.0	82.5	81.3	70.8	90.4	79.1	87.5		Yes		
Industrial/Port	823-12093	85.8	90.9	86.7	95.0	93.4	92.1	81.3	98.0	59.6	79.6	90.4	82.1	90.9		No		
Industrial/Port	823-12095	85.8	90.9	86.7	95.0	93.4	90.0	80.8	85.4	95.0	80.8	90.4	86.4	95.6		No		
Industrial/Port	823-12096	85.8	90.9	86.7	95.0	93.4	96.3	76.3	97.9	84.6	86.3	90.4	88.3	97.7		No		
Industrial/Port	823-12097	85.8	90.9	86.7	95.0	93.4	92.4	83.8	78.8	90.0	82.5	90.4	85.5	94.6		No		
Industrial/Port	823-12098	90.5	93.9	93.6	89.2	80.3	93.2	93.9	87.1	90.8	84.7	89.5	90.0	101		No		
Industrial/Port	823-12099	90.5	93.9	93.6	89.2	80.3	90.5	88.1	88.5	76.3	82.7	89.5	85.2	95.2		No		
FW-Influenced	823-12102	85.8	90.9	86.7	95.0	93.4	86.3	91.7	89.2	90.4	84.2	90.4	88.3	97.8		No		
Industrial/Port	823-12103	90.5	93.9	93.6	89.2	80.3	84.4	85.4	69.2	72.9	75.9	89.5	77.6	86.7		Yes		
Industrial/Port	823-12107	90.5	93.9	93.6	89.2	80.3	87.8	84.4	97.4	86.8	85.1	89.5	88.3	98.7		No		
FW-Influenced	823-12109	90.5	93.9	93.6	89.2	80.3	95.7	81.0	84.1	87.8	82.0	89.5	86.1	96.2		No		
FW-Influenced	823-12110	90.5	93.9	93.6	89.2	80.3	94.2	86.4	92.5	86.1	83.1	89.5	88.5	98.9		No		
Industrial/Port	823-12114	90.5	93.9	93.6	89.2	80.3	65.4	80.0	66.1	74.6	88.1	89.5	74.8	83.6		Yes		
Industrial/Port	823-12115	90.5	93.9	93.6	89.2	80.3	87.5	83.4	78.0	79.0	84.7	89.5	82.5	92.2		Yes		
FW-Influenced	823-12155	90.5	93.9	93.6	89.2	80.3	72.5	69.2	72.5	68.8	86.1	89.5	73.8	82.5		Yes		
San Diego Bay - South	Shallow	823-12000	88.9	91.1	87.0	91.1	88.5	90.0	85.6	88.9	88.1	82.6	89.3	87.0	97.4		No	
	Shallow	823-12001	88.9	91.1	87.0	91.1	88.5	88.5	80.7	83.7	89.6	90.0	89.3	86.5	96.8		No	
	Shallow	823-12002	88.9	91.1	87.0	91.1	88.5	94.1	84.1	84.8	86.3	88.5	89.3	87.6	98.0		No	
	Shallow	823-12003	85.8	90.9	86.7	95.0	93.4	85.4	80.0	96.0	95.9	97.2	90.4	90.9	101		No	
	Deep	823-12004	85.8	90.9	86.7	95.0	93.4	79.2	79.6	78.3	91.3	86.3	90.4	82.9	91.8		Yes	
	FW-Influenced	823-12005	88.9	91.1	87.0	91.1	88.5	86.3	82.6	86.3	93.5	83.0	89.3	86.3	96.6		No	
	FW-Influenced	823-12006	85.8	90.9	86.7	95.0	93.4	90.8	85.8	82.1	80.4	86.3	90.4	85.1	94.2		Yes	
	FW-Influenced	823-12007	85.8	90.9	86.7	95.0	93.4	81.3	93.8	68.8	87.1	94.2	90.4	85.0	94.1		No	
	FW-Influenced	823-12008	85.8	90.9	86.7	95.0	93.4	80.0	93.3	76.3	87.5	83.8	90.4	84.2	93.2		No	
	Shallow	823-12045	85.8	90.9	86.7	95.0	93.4	91.7	95.2	83.3	75.0	46.7	90.4	78.4	86.7		No	
	Marina	823-12046	85.8	90.9	86.7	95.0	93.4	95.8	81.7	80.4	97.5	77.1	90.4	86.5	95.7		No	
	FW-Influenced	823-12148	88.9	91.1	87.0	91.1	88.5	85.9	81.1	81.5	83							

APPENDIX D

List of Laboratory Qualifier Codes

Test Qualifier Codes

QC1: Temperatures out of recommended range; corrective action taken.

QC2: Temperatures out of recommended range; no action taken; test terminated.

QC3: Test initiated on aeration due to anticipated drop in dissolved oxygen.

QC4: Dissolved oxygen percent saturation <110, if DO > 9.0.

QC5: All temperature recordings include a verified correction factor that is applicable to the temperature-sensing device being used in the measurement.

QC6: Inadequate sample volume remaining; 50% renewal performed.

QC7: Inadequate sample volume remaining; no renewal performed.

QC8: Organisms received at a temperature outside of recommended range of test specifications. Temperature changed more than 3 degrees Celsius within a 24-hour period.

QC9: Organisms received at a salinity outside of 3 ppt of recommended test specifications. Acclimated to appropriate salinity within a 24-hour period.

QC10: Survival counts not recorded due to poor visibility.

APPENDIX E

Reference Toxicant Tests & Control Charts

Amphipod Reference Toxicant

96-hr Survival

8/15/23

CETIS Summary Report

Report Date: 02 Apr-25 10:56 (p 1 of 1)
Test Code/ID: 230815eeraNH3 / 10-7396-0839

Reference Toxicant 96-h Acute Survival Test

WSP Laboratory

Batch ID: 06-5386-3728	Test Type: Survival	Analyst:
Start Date: 15 Aug-23 16:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Diluted Natural Seawater
Ending Date: 19 Aug-23 14:10	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 94h	Taxon:	Source: Northwest Amphipod, OR Age:
Sample ID: 20-7476-8847	Code: 230815eeraNH3	Project:
Sample Date: 15 Aug-23	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 15 Aug-23	CAS (PC):	Station:
Sample Age: 16h	Client: Internal	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD
21-1893-2065	Survival Rate	Steel Many-One Rank Sum Test	128.83	264.74	184.7	10.4%

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL
06-5449-3229	Survival Rate	Trimmed Spearman-Kärber	LC50	196.8	164.8	235.1

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	0.00%
16.71		4	0.9000	0.7701	1.0300	0.8000	1.0000	0.0408	0.0817	9.07%	7.69%
34.16		4	0.9250	0.7727	1.0770	0.8000	1.0000	0.0479	0.0957	10.35%	5.13%
63.44		4	0.8000	0.6701	0.9299	0.7000	0.9000	0.0408	0.0817	10.21%	17.95%
128.83		4	0.8250	0.7454	0.9046	0.8000	0.9000	0.0250	0.0500	6.06%	15.38%
264.74		4	0.3750	0.2954	0.4546	0.3000	0.4000	0.0250	0.0500	13.33%	61.54%
487.51		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	—	100.00%

Survival Rate Detail

MD5: 00066F46671C8E00D6C2AD6DB383A500

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	LC	1.0000	0.9000	1.0000	1.0000
16.71		1.0000	0.8000	0.9000	0.9000
34.16		1.0000	0.8000	0.9000	1.0000
63.44		0.7000	0.8000	0.8000	0.9000
128.83		0.8000	0.8000	0.8000	0.9000
264.74		0.4000	0.4000	0.3000	0.4000
487.51		0.0000	0.0000	0.0000	0.0000

CETIS Analytical Report

Report Date: 02 Apr-25 10:56 (p 1 of 2)
 Test Code/ID: 230815eeraNH3 / 10-7396-0839

Reference Toxicant 96-h Acute Survival Test						WSP Laboratory					
Analysis ID: 21-1893-2065	Endpoint: Survival Rate	CETIS Version: CETIS v2.1.5									
Analyzed: 02 Apr-25 10:54	Analysis: Nonparametric-Control vs Treatments	Status Level: 1									
Edit Date: 02 Apr-25 0:00	MD5 Hash: 00066F46671C8E00D6C2AD6DB383A500	Editor ID: 002-883-387-8									
Batch ID: 06-5386-3728	Test Type: Survival	Analyst:									
Start Date: 15 Aug-23 16:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Diluted Natural Seawater									
Ending Date: 19 Aug-23 14:10	Species: Eohaustorius estuarius	Brine: Not Applicable									
Test Length: 94h	Taxon:	Source: Northwest Amphipod, OR Age:									
Sample ID: 20-7476-8847	Code: 230815eeraNH3	Project:									
Sample Date: 15 Aug-23	Material: Total Ammonia	Source: Reference Toxicant									
Receipt Date: 15 Aug-23	CAS (PC):	Station:									
Sample Age: 16h	Client: Internal										
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD				
Angular (Corrected)	C > T	128.83	264.74	184.7	---	0.1013	10.39%				
Steel Many-One Rank Sum Test											
Control	vs	Conc-mg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Lab Control		16.71	6	13.5	10	2	CDF	0.3133	Non-Significant Effect		
		34.16	6	15.5	10	2	CDF	0.5790	Non-Significant Effect		
		63.44	6	10.5	10	1	CDF	0.0670	Non-Significant Effect		
		128.83	6	10.5	10	1	CDF	0.0670	Non-Significant Effect		
		264.74*	6	10	10	0	CDF	0.0480	Significant Effect		
		487.51*	6	10	10	0	CDF	0.0480	Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	4.58853	0.764755	6	85.38	<1.0E-05	Significant Effect					
Error	0.188092	0.0089567	21								
Total	4.77662		27								
ANOVA Assumptions Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variance	Bartlett Equality of Variance Test				Indeterminate						
Distribution	Shapiro-Wilk W Normality Test	0.9573	0.8975	0.3010	Normal Distribution						
Survival Rate Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	0.00%
16.71		4	0.9000	0.7701	1.0000	0.9000	0.8000	1.0000	0.0408	9.07%	7.69%
34.16		4	0.9250	0.7727	1.0000	0.9500	0.8000	1.0000	0.0479	10.35%	5.13%
63.44		4	0.8000	0.6701	0.9299	0.8000	0.7000	0.9000	0.0408	10.21%	17.95%
128.83		4	0.8250	0.7454	0.9046	0.8000	0.8000	0.9000	0.0250	6.06%	15.38%
264.74		4	0.3750	0.2954	0.4546	0.4000	0.3000	0.4000	0.0250	13.33%	61.54%
487.51		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	---	100.00%
Angular (Corrected) Transformed Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	0.00%
16.71		4	1.2540	1.0560	1.4530	1.2490	1.1070	1.4120	0.0623	9.93%	8.53%
34.16		4	1.2950	1.0610	1.5290	1.3310	1.1070	1.4120	0.0735	11.35%	5.56%
63.44		4	1.1140	0.9457	1.2820	1.1070	0.9912	1.2490	0.0528	9.48%	18.79%
128.83		4	1.1430	1.0300	1.2560	1.1070	1.1070	1.2490	0.0355	6.21%	16.67%
264.74		4	0.6584	0.5748	0.7421	0.6847	0.5796	0.6847	0.0263	7.98%	51.98%
487.51		4	0.1588	0.1588	0.1588	0.1588	0.1588	0.1588	0.0000	0.00%	88.42%

CETIS Analytical Report

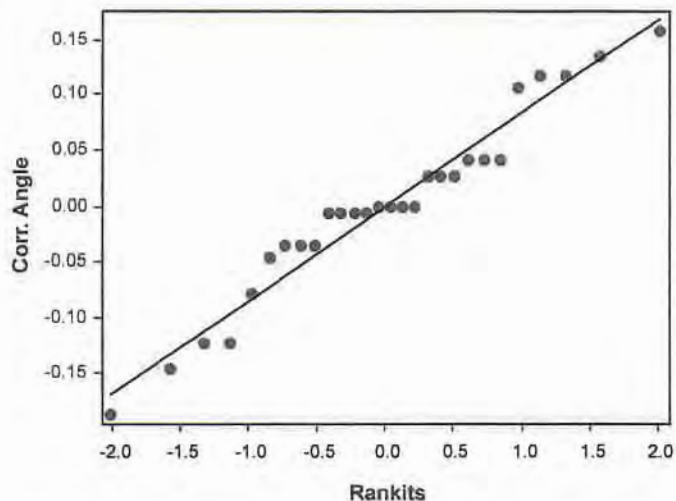
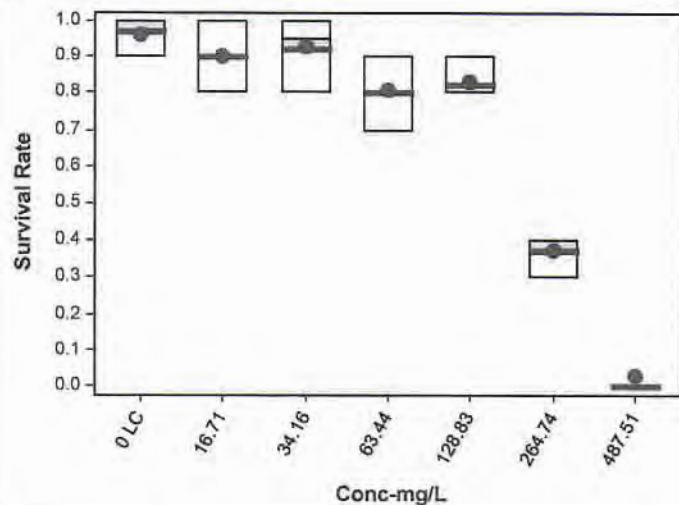
Report Date: 02 Apr-25 10:56 (p 2 of 2)
Test Code/ID: 230815eeraNH3 / 10-7396-0839

Reference Toxicant 96-h Acute Survival Test

WSP Laboratory

Analysis ID: 21-1893-2065	Endpoint: Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 02 Apr-25 10:54	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 02 Apr-25 0:00	MD5 Hash: 00066F46671C8E00D6C2AD6DB383A500	Editor ID: 002-883-387-8

Graphics



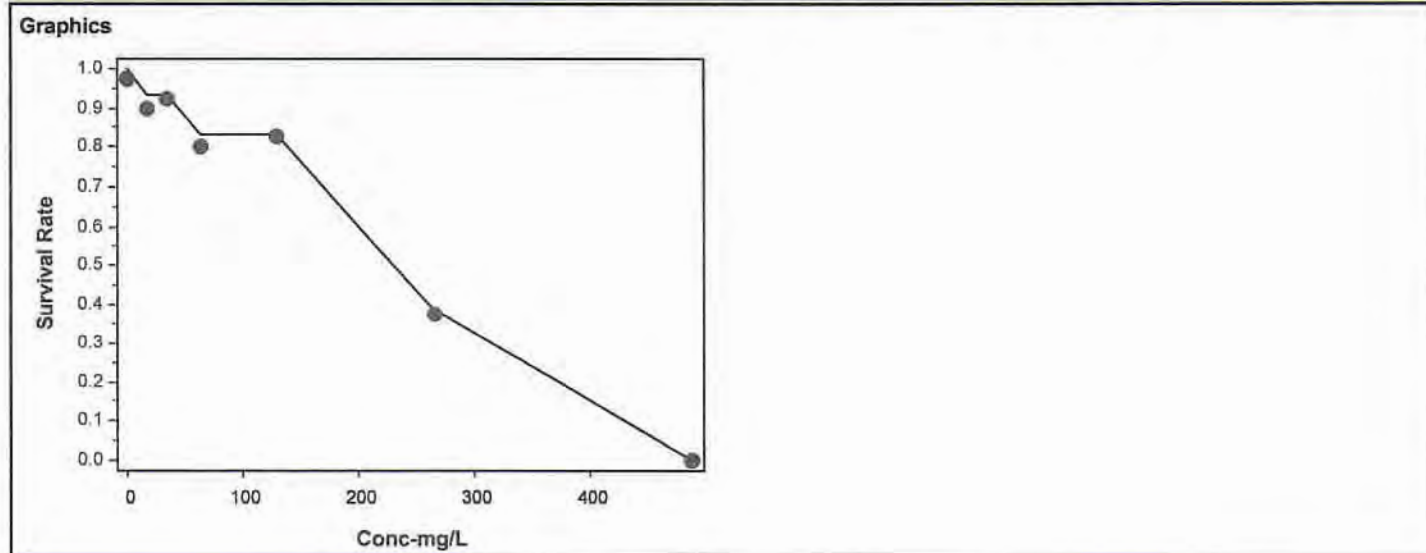
CETIS Analytical Report

Report Date: 02 Apr-25 10:56 (p 1 of 1)
 Test Code/ID: 230815eeraNH3 / 10-7396-0839

Reference Toxicant 96-h Acute Survival Test				WSP Laboratory	
Analysis ID: 06-5449-3229		Endpoint: Survival Rate		CETIS Version: CETIS v2.1.5	
Analyzed: 02 Apr-25 10:54		Analysis: Trimmed Spearman-Kärber		Status Level: 1	
Edit Date: 02 Apr-25 0:00		MD5 Hash: 00066F46671C8E00D6C2AD6DB383A500		Editor ID: 002-883-387-8	
Batch ID: 06-5386-3728		Test Type: Survival		Analyst:	
Start Date: 15 Aug-23 16:00		Protocol: EPA/600/R-94/025 (1994)		Diluent: Diluted Natural Seawater	
Ending Date: 19 Aug-23 14:10		Species: Eohaustorius estuarius		Brine: Not Applicable	
Test Length: 94h		Taxon:		Source: Northwest Amphipod,OR Age:	
Sample ID: 20-7476-8847		Code: 230815eeraNH3		Project:	
Sample Date: 15 Aug-23		Material: Total Ammonia		Source: Reference Toxicant	
Receipt Date: 15 Aug-23		CAS (PC):		Station:	
Sample Age: 16h		Client: Internal			

Trimmed Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	LC50	95% LCL	95% UCL
Control Threshold	0.025	6.41%	2.294	0.03858	196.8	164.8	235.1

Survival Rate Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-mg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	LC	4	0.9750	1.0000	0.9000	1.0000	5.13%	0.00%	39/40	0.9750	0.00%
16.71		4	0.9000	0.9000	0.8000	1.0000	9.07%	7.69%	36/40	0.9125	6.41%
34.16		4	0.9250	0.9500	0.8000	1.0000	10.35%	5.13%	37/40	0.9125	6.41%
63.44		4	0.8000	0.8000	0.7000	0.9000	10.21%	17.95%	32/40	0.8125	16.67%
128.83		4	0.8250	0.8000	0.8000	0.9000	6.06%	15.38%	33/40	0.8125	16.67%
264.74		4	0.3750	0.4000	0.3000	0.4000	13.33%	61.54%	15/40	0.3750	61.54%
487.51		4	0.0000	0.0000	0.0000	0.0000	---	100.00%	0/40	0.0000	100.00%



Reference Toxicant 96-h Acute Survival Test

All Matching Labs

Test Type: Survival

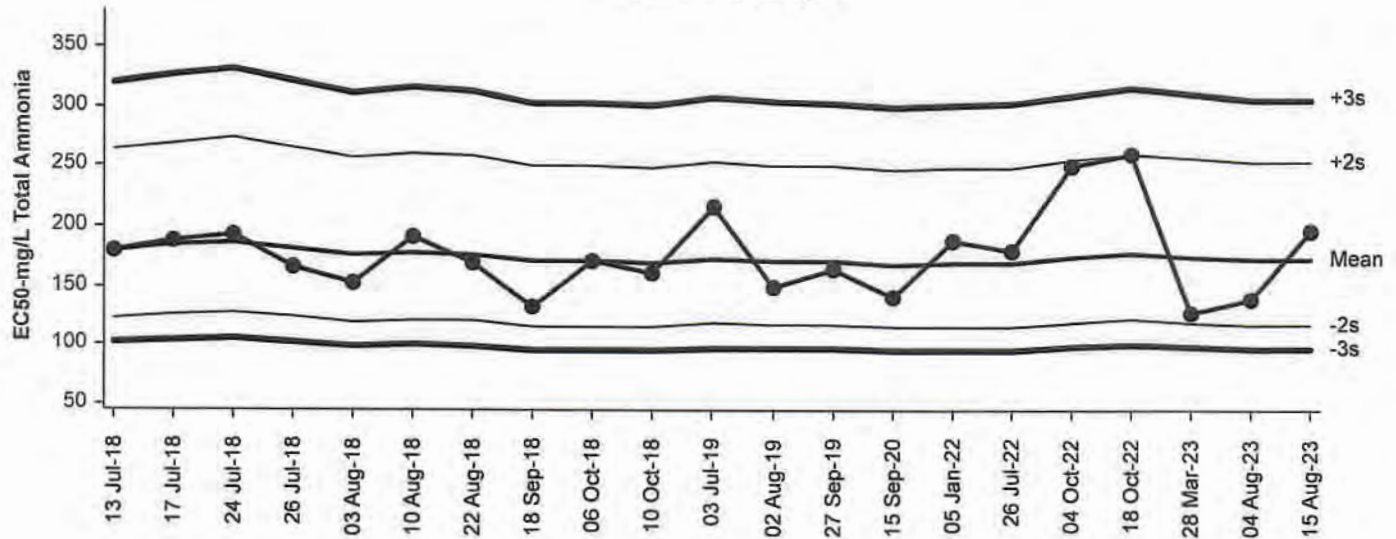
Organism: Eohaustorius estuarius

Material: Total Ammonia

Protocol: EPA/600/R-94/025 (1994)

Endpoint: Survival Rate

Source: Reference Toxicant-REF

Reference Toxicant 96-h Acute Survival Test
Survival Rate Endpoint

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2018	Jul	13	15:30	180.6	7.271	0.2159			04-2185-5907	05-6355-4552	Wood E&IS
2			17	13:45	188.1	14.83	0.4313			21-0757-7657	02-6316-5081	Wood E&IS
3			24	15:00	193.5	20.16	0.5779			15-3046-7177	07-7640-7637	Wood E&IS
4			26	16:00	165.7	-7.599	-0.2355			20-1199-2155	06-4886-8502	Wood E&IS
5		Aug	3	17:30	153.5	-19.8	-0.6371			19-4551-1093	09-4084-7224	Wood E&IS
6			10	14:00	191.3	18.02	0.5197			02-1422-9338	07-4510-0224	Wood E&IS
7			22	12:50	169.1	-4.24	-0.1301			13-3972-1221	10-4694-7981	Wood E&IS
8		Sep	18	13:45	133.3	-40	-1.378			03-9292-6241	11-0295-8556	Wood E&IS
9		Oct	6	15:30	171	-2.342	-0.07147			08-6045-8534	01-4335-0007	Wood E&IS
10			10	13:15	161.5	-11.82	-0.371			08-2532-3011	06-6044-8622	Wood E&IS
11	2019	Jul	3	15:00	217.5	44.17	1.192			19-8627-5111	03-2795-7879	Wood E&IS
12		Aug	2	16:20	149.7	-23.64	-0.7702			10-1458-6313	20-1198-1922	Wood E&IS
13		Sep	27	16:30	164.8	-8.54	-0.2654			13-3401-8110	09-3881-8548	Wood E&IS
14	2020		15	13:30	141.4	-31.85	-1.067			02-0308-2638	10-0008-1818	Wood E&IS
15	2022	Jan	5	14:30	187.6	14.29	0.4162			02-1174-7854	11-1256-1947	Wood E&IS
16		Jul	26	17:00	179.5	6.213	0.185			15-2681-1039	18-7248-3159	Wood E&IS
17		Oct	4	16:50	250.6	77.27	1.937			12-5994-4968	10-4632-4356	Wood E&IS
18			18	0:00	261.3	87.99	2.157	(+)		18-6334-4102	01-6647-8236	Wood E&IS
19	2023	Mar	28	15:30	128	-45.26	-1.59			02-2479-2872	05-9533-9305	WSP Laboratory
20		Aug	4	14:30	139.6	-33.7	-1.136			07-2916-3154	12-5306-1149	WSP Laboratory
21			15	16:00	196.8	23.55	0.6693			10-7396-0839	04-9129-4472	WSP Laboratory

96hr Static Acute Amphipod Test

Client: Internal

Test Species: *E. estuarius*

Project ID: NH₃ Reftox

Start Date/Time: 8/15/2023 1600

Test No. 230815eeraNH3

End Date/Time: 8/19/2023 1410

Concentration (mg/L)	Rep	Counts					Water Quality					
		0	24	48	72	96	Parameter	0	24	48	72	96
Lab Control	A	10				10	Temp. (°C)	16.0	14.5	14.8	15.7	15.7
	B	10				9	Salinity (ppt)	29.7		29.6		29.6
	C	10				10	pH (units)	8.03		7.55		7.67
	D	10				10	DO (mg/L)	7.6		7.3		7.3
15.6 RV (15.7) 16	A	10				10	Temp. (°C)	16.0	14.3	14.8	15.6	15.5
	B	10				8	Salinity (ppt)	29.8		29.8		29.8
	C	10				9	pH (units)	8.01		7.54		7.64
	D	10				9	DO (mg/L)	7.7		7.6		7.4
31.2 RV (28) 34.2	A	10				10	Temp. (°C)	16.0	14.3	14.8	15.5	15.5
	B	10				8	Salinity (ppt)	29.9		29.7		29.8
	C	10				9	pH (units)	7.94		7.55		7.63
	D	10				10	DO (mg/L)	7.8		7.7		7.3
62.5 RV (52) 63.4	A	10				7	Temp. (°C)	16.0	14.2	14.7	15.5	15.4
	B	10				8	Salinity (ppt)	30.0		30.0		30.0
	C	10				8	pH (units)	7.86		7.55		7.62
	D	10				9	DO (mg/L)	7.7		7.7		7.4
125 RV (105.6) (128.8)	A	10				8	Temp. (°C)	16.0	14.2	14.7	15.4	15.4
	B	10				8	Salinity (ppt)	30.2		30.2		30.2
	C	10				8	pH (units)	7.76		7.53		7.61
	D	10				9	DO (mg/L)	7.8		7.8		7.4
250 RV (227) 264.7	A	10				4	Temp. (°C)	15.9	14.2	14.7	15.4	15.3
	B	10				4	Salinity (ppt)	30.7		30.6		30.6
	C	10				3	pH (units)	7.59		7.49		7.58
	D	10				4	DO (mg/L)	8.8		7.7		7.4
500 RV (394.6) 497.5	A	10				0	Temp. (°C)	16.0	14.2	14.7	15.4	15.2
	B	10				0	Salinity (ppt)	31.4		31.3		31.3
	C	10				0	pH (units)	7.41		7.41		7.49
	D	10				0	DO (mg/L)	7.7		7.6		7.3
Tech Initials: JF						JF	Tech Initials: JF		HK	KYB	HK	JF

QC: KYB

Date Animals Received: 8/9/23

Ammonia Subsamples Collected:

Start: AG

End: AG

Age or Size of Animals: 3-5mm

Comments:

QC Check: HK 11/8/2023

Final Review: JS

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: *E. estuarius*

Project ID: NH3 Reftox

Start Date: 8/15/2023

Test No.: 230815 era NH3

End Date: 8/19/2023

DI Blank: 0.0

10 mg/L Ammonia Stock:

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check: HK 11/8123

Final Review: JS

B23_Eoh Reflox Unionized LC Redefined

									Unionized Ammonia Calculation for Pressure of 1 atm										
									Input 'Shaded' data										
										I	pK								
										1	9.26								
										2	9.27								
										3	9.28								
										4	9.29								
										5	9.30								
										6	9.32								
										7	9.33								
										8	9.34								

Amphipod Reference Toxicant

96-hr Survival

8/22/23

CETIS Summary Report

Report Date: 02 Apr-25 16:27 (p 1 of 1)
 Test Code/ID: 230822eeraNH3 / 16-5257-3809

Reference Toxicant 96-h Acute Survival Test

WSP Laboratory

Batch ID: 04-6653-9724	Test Type: Survival	Analyst:
Start Date: 22 Aug-23 14:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Diluted Natural Seawater
Ending Date: 26 Aug-23 12:00	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 94h	Taxon:	Source: Northwest Amphipod, OR Age:

Sample ID: 16-6565-2066	Code: 230822eeraNH3	Project:
Sample Date: 22 Aug-23	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 22 Aug-23	CAS (PC):	Station:
Sample Age: 14h	Client: Internal	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD
16-3840-5281	Survival Rate	Dunnett Multiple Comparison Test	119.07	247.42	171.6	16.0%

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL
20-4909-4550	Survival Rate	Spearman-Kärber	LC50	184.4	163.6	207.8

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	0.00%
15.01		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	0.00%
29.65		4	0.9500	0.8581	1.0420	0.9000	1.0000	0.0289	0.0577	6.08%	2.56%
61.73		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	0.00%
119.07		4	0.8750	0.6363	1.1140	0.7000	1.0000	0.0750	0.1500	17.14%	10.26%
247.42		4	0.2250	-0.0137	0.4637	0.0000	0.3000	0.0750	0.1500	66.67%	76.92%
479.46		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	—	100.00%

Survival Rate Detail

MD5: 33A69E82DBC3C408D90D93D93CE212E2

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	LC	1.0000	1.0000	1.0000	0.9000
15.01		0.9000	1.0000	1.0000	1.0000
29.65		1.0000	0.9000	1.0000	0.9000
61.73		0.9000	1.0000	1.0000	1.0000
119.07		0.7000	0.8000	1.0000	1.0000
247.42		0.3000	0.3000	0.0000	0.3000
479.46		0.0000	0.0000	0.0000	0.0000

CETIS Analytical Report

Report Date: 02 Apr-25 16:27 (p 1 of 2)
Test Code/ID: 230822eeraNH3 / 16-5257-3809

Reference Toxicant 96-h Acute Survival Test						WSP Laboratory					
Analysis ID: 16-3840-5281		Endpoint: Survival Rate		CETIS Version: CETIS v2.1.5							
Analyzed: 02 Apr-25 9:49		Analysis: Parametric-Control vs Treatments		Status Level: 1							
Edit Date: 02 Apr-25 0:00		MD5 Hash: 33A69E82DBC3C408D90D93D93CE212E2		Editor ID: 002-883-387-8							
Batch ID: 04-6653-9724		Test Type: Survival		Analyst:							
Start Date: 22 Aug-23 14:00		Protocol: EPA/600/R-94/025 (1994)		Diluent: Diluted Natural Seawater							
Ending Date: 26 Aug-23 12:00		Species: Eohaustorius estuarius		Brine: Not Applicable							
Test Length: 94h		Taxon:		Source: Northwest Amphipod,OR Age:							
Sample ID: 16-6565-2066		Code: 230822eeraNH3		Project:							
Sample Date: 22 Aug-23		Material: Total Ammonia		Source: Reference Toxicant							
Receipt Date: 22 Aug-23		CAS (PC):		Station:							
Sample Age: 14h		Client: Internal									
Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD				
Angular (Corrected)	C > T	119.07	247.42	171.6	---	0.156	16.00%				
Dunnett Multiple Comparison Test											
Control	vs	Conc-mg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)		
Lab Control		15.01	6	0	2.407	0.2399	CDF	0.8333	Non-Significant Effect		
		29.65	6	0.4088	2.407	0.2399	CDF	0.6864	Non-Significant Effect		
		61.73	6	0	2.407	0.2399	CDF	0.8333	Non-Significant Effect		
		119.07	6	1.412	2.407	0.2399	CDF	0.2575	Non-Significant Effect		
		247.42*	6	8.999	2.407	0.2399	CDF	2.7E-05	Significant Effect		
ANOVA Table											
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)					
Between	2.52804	0.505608	5	25.45	<1.0E-05	Significant Effect					
Error	0.357557	0.0198643	18								
Total	2.88559		23								
ANOVA Assumptions Tests											
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)						
Variance	Bartlett Equality of Variance Test	6.51	15.09	0.2597	Equal Variances						
Distribution	Shapiro-Wilk W Normality Test	0.8946	0.884	0.0166	Normal Distribution						
Survival Rate Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	0.00%
15.01		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	0.00%
29.65		4	0.9500	0.8581	1.0000	0.9500	0.9000	1.0000	0.0289	6.08%	2.56%
61.73		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	0.00%
119.07		4	0.8750	0.6363	1.0000	0.9000	0.7000	1.0000	0.0750	17.14%	10.26%
247.42		4	0.2250	0.0000	0.4637	0.3000	0.0000	0.3000	0.0750	66.67%	76.92%
479.46		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	---	100.00%
Angular (Corrected) Transformed Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	0.00%
15.01		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	0.00%
29.65		4	1.3310	1.1810	1.4800	1.3310	1.2490	1.4120	0.0471	7.07%	2.97%
61.73		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	0.00%
119.07		4	1.2310	0.8888	1.5720	1.2600	0.9912	1.4120	0.1074	17.45%	10.26%
247.42		4	0.4744	0.1396	0.8093	0.5796	0.1588	0.5796	0.1052	44.35%	65.40%
479.46		4	0.1588	0.1588	0.1588	0.1588	0.1588	0.1588	0.0000	0.00%	88.42%

CETIS Analytical Report

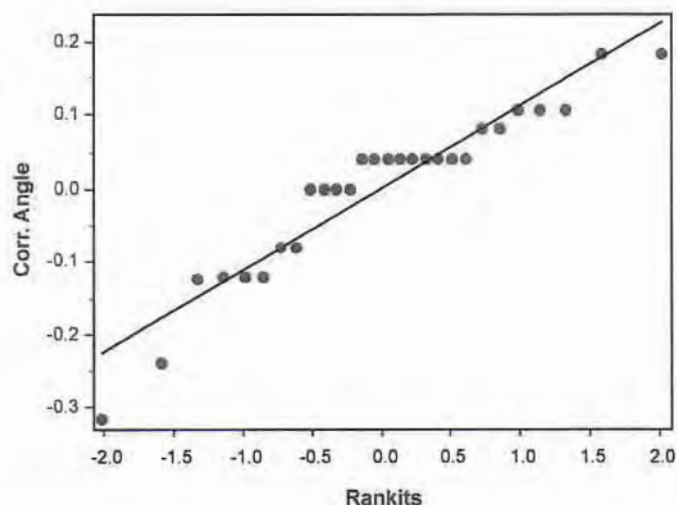
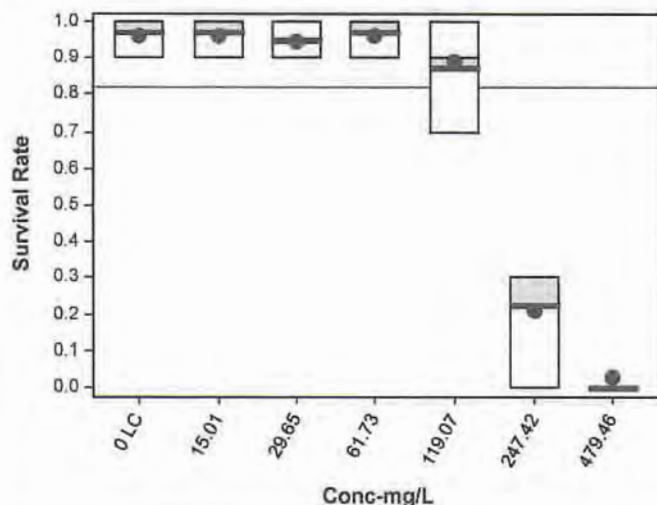
Report Date: 02 Apr-25 16:27 (p 2 of 2)
 Test Code/ID: 230822eeraNH3 / 16-5257-3809

Reference Toxicant 96-h Acute Survival Test

WSP Laboratory

Analysis ID: 16-3840-5281 Endpoint: Survival Rate CETIS Version: CETIS v2.1.5
 Analyzed: 02 Apr-25 9:49 Analysis: Parametric-Control vs Treatments Status Level: 1
 Edit Date: 02 Apr-25 0:00 MD5 Hash: 33A69E82DBC3C408D90D93D93CE212E2 Editor ID: 002-883-387-8

Graphics



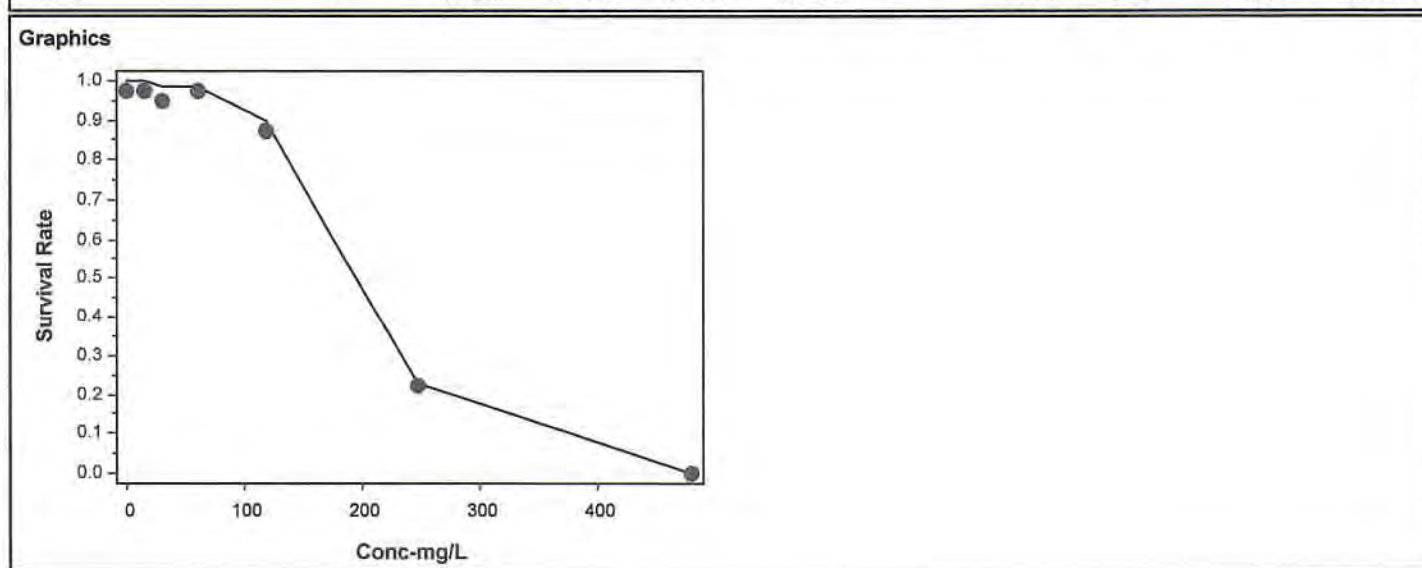
CETIS Analytical Report

Report Date: 02 Apr-25 16:27 (p 1 of 1)
Test Code/ID: 230822eeraNH3 / 16-5257-3809

Reference Toxicant 96-h Acute Survival Test				WSP Laboratory			
Analysis ID: 20-4909-4550	Endpoint: Survival Rate	CETIS Version: CETIS v2.1.5					
Analyzed: 02 Apr-25 9:49	Analysis: Untrimmed Spearman-Kärber	Status Level: 1					
Edit Date: 02 Apr-25 0:00	MD5 Hash: 33A69E82DBC3C408D90D93D93CE212E2	Editor ID: 002-883-387-8					
Batch ID: 04-6653-9724	Test Type: Survival	Analyst:					
Start Date: 22 Aug-23 14:00	Protocol: EPA/600/R-94/025 (1994)	Diluent: Diluted Natural Seawater					
Ending Date: 26 Aug-23 12:00	Species: Eohaustorius estuarius	Brine: Not Applicable					
Test Length: 94h	Taxon:	Source: Northwest Amphipod,OR		Age:			
Sample ID: 16-6565-2066	Code: 230822eeraNH3	Project:					
Sample Date: 22 Aug-23	Material: Total Ammonia	Source: Reference Toxicant					
Receipt Date: 22 Aug-23	CAS (PC):	Station:					
Sample Age: 14h	Client: Internal						

Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	LC50	95% LCL	95% UCL
Control Threshold	0.025	0.00%	2.266	0.02596	184.4	163.6	207.8

Survival Rate Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-mg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	LC	4	0.9750	1.0000	0.9000	1.0000	5.13%	0.00%	39/40	0.9750	0.00%
15.01		4	0.9750	1.0000	0.9000	1.0000	5.13%	0.00%	39/40	0.9750	0.00%
29.65		4	0.9500	0.9500	0.9000	1.0000	6.08%	2.56%	38/40	0.9625	1.28%
61.73		4	0.9750	1.0000	0.9000	1.0000	5.13%	0.00%	39/40	0.9625	1.28%
119.07		4	0.8750	0.9000	0.7000	1.0000	17.14%	10.26%	35/40	0.8750	10.26%
247.42		4	0.2250	0.3000	0.0000	0.3000	66.67%	76.92%	9/40	0.2250	76.92%
479.46		4	0.0000	0.0000	0.0000	0.0000	---	100.00%	0/40	0.0000	100.00%



Reference Toxicant 96-h Acute Survival Test

All Matching Labs

Test Type: Survival

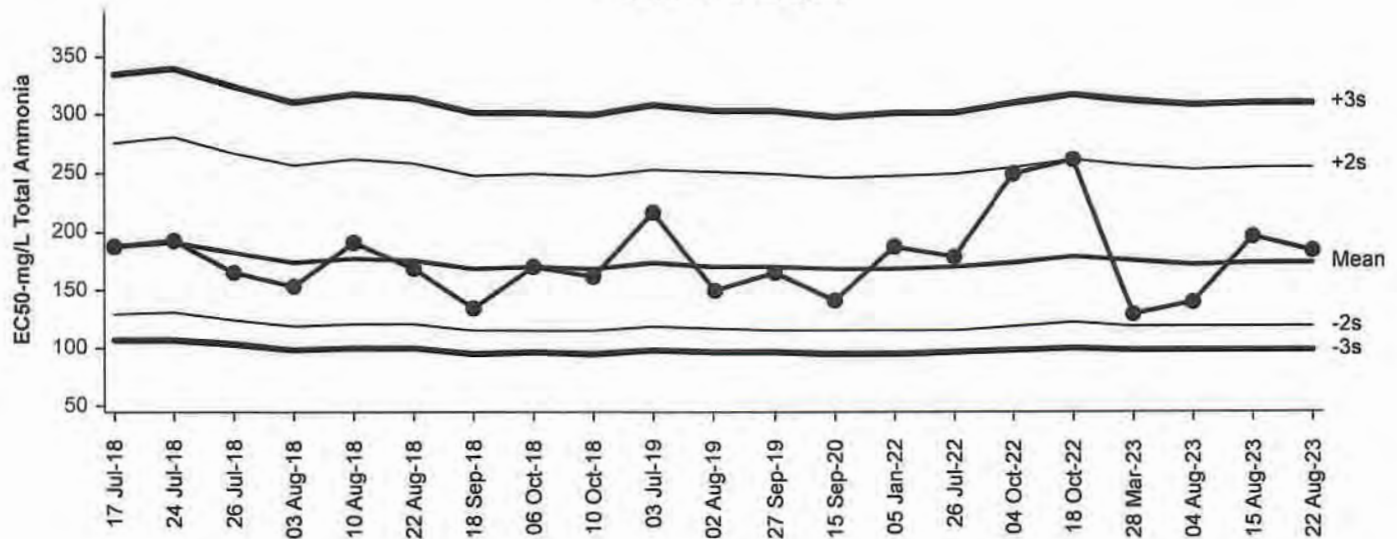
Organism: Eohaustorius estuarius

Material: Total Ammonia

Protocol: EPA/600/R-94/025 (1994)

Endpoint: Survival Rate

Source: Reference Toxicant-REF

Reference Toxicant 96-h Acute Survival Test
Survival Rate Endpoint

Lognormal Cumulative Mean Plot

Mean: 174

Count: 20

-2s Warning Limit: 118

-3s Action Limit: 97.7

Sigma: NA

CV: 19.40%

+2s Warning Limit: 256

+3s Action Limit: 310

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2018	Jul	17	13:45	188.1	14.14	0.406			21-0757-7657	02-6316-5081	Wood E&IS
2			24	15:00	193.5	19.46	0.5511			15-3046-7177	07-7640-7637	Wood E&IS
3			26	16:00	165.7	-8.293	-0.2538			20-1199-2155	06-4886-8502	Wood E&IS
4		Aug	3	17:30	153.5	-20.49	-0.6513			19-4551-1093	09-4084-7224	Wood E&IS
5			10	14:00	191.3	17.33	0.4935			02-1422-9338	07-4510-0224	Wood E&IS
6			22	12:50	169.1	-4.934	-0.1495			13-3972-1221	10-4694-7981	Wood E&IS
7		Sep	18	13:45	133.3	-40.7	-1.385			03-9292-6241	11-0295-8556	Wood E&IS
8		Oct	6	15:30	171	-3.037	-0.09152			08-6045-8534	01-4335-0007	Wood E&IS
9			10	13:15	161.5	-12.51	-0.3879			08-2532-3011	06-6044-8622	Wood E&IS
10	2019	Jul	3	15:00	217.5	43.48	1.159			19-8627-5111	03-2795-7879	Wood E&IS
11		Aug	2	16:20	149.7	-24.33	-0.783			10-1458-6313	20-1198-1922	Wood E&IS
12		Sep	27	16:30	164.8	-9.234	-0.2834			13-3401-8110	09-3881-8548	Wood E&IS
13	2020		15	13:30	141.4	-32.54	-1.076			02-0308-2638	10-0008-1818	Wood E&IS
14	2022	Jan	5	14:30	187.6	13.6	0.3911			02-1174-7854	11-1256-1947	Wood E&IS
15		Jul	26	17:00	179.5	5.519	0.1623			15-2681-1039	18-7248-3159	Wood E&IS
16		Oct	4	16:50	250.6	76.57	1.896			12-5994-4968	10-4632-4356	Wood E&IS
17			18	0:00	261.3	87.3	2.113	(+)		18-6334-4102	01-6647-8236	Wood E&IS
18	2023	Mar	28	15:30	128	-45.96	-1.594			02-2479-2872	05-9533-9305	WSP Laboratory
19		Aug	4	14:30	139.6	-34.4	-1.145			07-2916-3154	12-5306-1149	WSP Laboratory
20			15	16:00	196.8	22.86	0.6415			10-7396-0839	04-9129-4472	WSP Laboratory
21			22	14:00	184.4	10.38	0.3012			16-5257-3809	08-1299-1791	WSP Laboratory

96hr Static Acute Amphipod Test

Client: Internal

Project ID: NH₃ Reftox

Test No. 230822eeraNH3

Test Species: *E. estuarius*

Start Date/Time: 8/22/2023 1400

End Date/Time: 8/26/2023 1200

Concentration (mg/L)	Rep	Counts					Water Quality					
		0	24	48	72	96	Parameter	0	24	48	72	96
Lab Control (0.5)	A	10				10	Temp. (°C)	15.7	14.4	14.4	14.2	14.0
	B	10				10	Salinity (ppt)	31.5		31.8		31.8
	C	10				10	pH (units)	7.98		7.63		7.65
	D	10				9	DO (mg/L)	7.1		7.4		7.6
15.6 (15.0)	A	10				9	Temp. (°C)	15.3	14.5	14.0	14.1	14.1
	B	10				10	Salinity (ppt)	31.7		31.9		31.8
	C	10				10	pH (units)	8.03		7.65		7.66
	D	10				10	DO (mg/L)	7.5		7.6		7.8
31.2 (29.65)	A	10				10	Temp. (°C)	15.2	14.5	14.0	14.1	14.2
	B	10				9	Salinity (ppt)	31.9		31.9		31.9
	C	10				10	pH (units)	7.97		7.66		7.67
	D	10				RV 109	DO (mg/L)	7.6		7.6		7.8
62.5 (61.73)	A	10				9	Temp. (°C)	15.0	14.5	14.0	14.0	14.3
	B	10				10	Salinity (ppt)	32.0		31.7		31.8
	C	10				10	pH (units)	7.92		7.64		7.67
	D	10				10	DO (mg/L)	7.7		7.7		7.8
125 (119.07)	A	10				7	Temp. (°C)	15.0	14.5	14.0	14.0	14.3
	B	10				8	Salinity (ppt)	32.3		32.2		32.1
	C	10				10	pH (units)	7.80		7.62		7.66
	D	10				10	DO (mg/L)	7.6		7.8		7.7
250 (247.42)	A	10				3	Temp. (°C)	15.1	14.5	14.0	14.0	14.3
	B	10				3	Salinity (ppt)	32.7		32.6		32.6
	C	10				0	pH (units)	7.65		7.56		7.61
	D	10				3	DO (mg/L)	7.7		7.7		7.4
500 (479.46)	A	10				0	Temp. (°C)	15.2	14.5	14.0	14.0	14.3
	B	10				0	Salinity (ppt)	33.6		33.4		33.3
	C	10				0	pH (units)	7.46		7.46		7.54
	D	10				0	DO (mg/L)	7.7		7.8		7.5
Tech Initials: KYB						RV	Tech Initials: JF AG KYB RV RV					

Date Animals Received: 8/17/23

Age or Size of Animals: 3-5mm

Ammonia Subsamples Collected:

Start: JF

End: RV

Comments:

QC Check: HV 11/8/2023

Final Review: AG 12/21/23

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: *E. estuarius*

Project ID: NH3 Reftox

Start Date: 8/22/2023 1400

Test No.: 230822 per NH3

End Date: 8/26/2023 1200

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.0

(x1.22)

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check: AG 12/21/23

Final Review: *Mod*

B23 Eoh Reftox Unionized LC Redefined

[illegible]

Amphipod Reference Toxicant

96-hr Survival

8/29/23

CETIS Analytical Report

 Report Date: 02 Apr-25 11:56 (p 1 of 2)
 Test Code/ID: 230829eeraNH3 / 10-2817-6825

Reference Toxicant 96-h Acute Survival Test							WSP Laboratory																
Analysis ID: 01-5950-1205		Endpoint: Survival Rate			CETIS Version: CETIS v2.1.5																		
Analyzed: 02 Apr-25 11:55		Analysis: Nonparametric-Control vs Treatments			Status Level: 1																		
Edit Date: 02 Apr-25 0:00		MD5 Hash: 2A4F5805CC321743160D6EF50948BBED			Editor ID: 002-883-387-8																		
Batch ID: 20-1626-5564		Test Type: Survival			Analyst:																		
Start Date: 29 Aug-23 10:30		Protocol: EPA/600/R-94/025 (1994)			Diluent: Diluted Natural Seawater																		
Ending Date: 02 Sep-23 09:30		Species: Eohaustorius estuarius			Brine: Not Applicable																		
Test Length: 95h		Taxon:			Source: Northwest Amphipod,OR		Age:																
Sample ID: 19-7070-5086		Code: 230829eeraNH3			Project:																		
Sample Date: 29 Aug-23		Material: Total Ammonia			Source: Reference Toxicant																		
Receipt Date: 29 Aug-23		CAS (PC):			Station:																		
Sample Age: 10h		Client: Internal																					
Data Transform		Alt Hyp		NOEL		LOEL		TOEL		Tox Units		MSDu		PMSD									
Angular (Corrected)		C > T		134.33		261.69		187.5		---		0.04869		4.99%									
Steel Many-One Rank Sum Test																							
Control		vs		Conc-mg/L		df		Test Stat		Critical		Ties		P-Type		P-Value		Decision(α:5%)					
Lab Control				16.59		6 20		10		1		CDF		0.9616		Non-Significant Effect							
				33.06		6 20		10		1		CDF		0.9616		Non-Significant Effect							
				67.93		6 18		10		2		CDF		0.8571		Non-Significant Effect							
				134.33		6 20		10		1		CDF		0.9616		Non-Significant Effect							
				261.69*		6 10		10		0		CDF		0.0480		Significant Effect							
				487.39*		6 10		10		0		CDF		0.0480		Significant Effect							
ANOVA Table																							
Source		Sum Squares		Mean Square		DF		F Stat		P-Value		Decision(α:5%)											
Between		8.75093		1.45849		6		768.8		<1.0E-05		Significant Effect											
Error		0.039839		0.0018971		21																	
Total		8.79077				27																	
ANOVA Assumptions Tests																							
Attribute		Test		Test Stat		Critical		P-Value		Decision(α:1%)													
Variance		Bartlett Equality of Variance Test								Indeterminate													
Distribution		Shapiro-Wilk W Normality Test		0.5824		0.8975		<1.0E-05		Non-Normal Distribution													
Survival Rate Summary																							
Conc-mg/L		Code		Count		Mean		95% LCL		95% UCL		Median		Min		Max		Std Err		CV%		%Effect	
0		LC		4		0.9750		0.8954		1.0000		1.0000		0.9000		1.0000		0.0250		5.13%		0.00%	
16.59				4		1.0000		1.0000		1.0000		1.0000		1.0000		1.0000		0.0000		0.00%		-2.56%	
33.06				4		1.0000		1.0000		1.0000		1.0000		1.0000		1.0000		0.0000		0.00%		-2.56%	
67.93				4		0.9750		0.8954		1.0000		1.0000		0.9000		1.0000		0.0250		5.13%		0.00%	
134.33				4		1.0000		1.0000		1.0000		1.0000		1.0000		1.0000		0.0000		0.00%		-2.56%	
261.69				4		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		---		100.00%	
487.39				4		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		---		100.00%	
Angular (Corrected) Transformed Summary																							
Conc-mg/L		Code		Count		Mean		95% LCL		95% UCL		Median		Min		Max		Std Err		CV%		%Effect	
0		LC		4		1.3710		1.2420		1.5010		1.4120		1.2490		1.4120		0.0407		5.94%		0.00%	
16.59				4		1.4120		1.4120		1.4120		1.4120		1.4120		1.4120		0.0000		0.00%		-2.97%	
33.06				4		1.4120		1.4120		1.4120		1.4120		1.4120		1.4120		0.0000		0.00%		-2.97%	
67.93				4		1.3710		1.2420		1.5010		1.4120		1.2490		1.4120		0.0407		5.94%		0.00%	
134.33				4		1.4120		1.4120		1.4120		1.4120		1.4120		1.4120		0.0000		0.00%		-2.97%	
261.69				4		0.1588		0.1588		0.1588		0.1588		0.1588		0.1588		0.0000		0.00%		88.42%	
487.39				4		0.1588		0.1588		0.1588		0.1588		0.1588		0.1588		0.0000		0.00%		88.42%	

JS

AB

CETIS Analytical Report

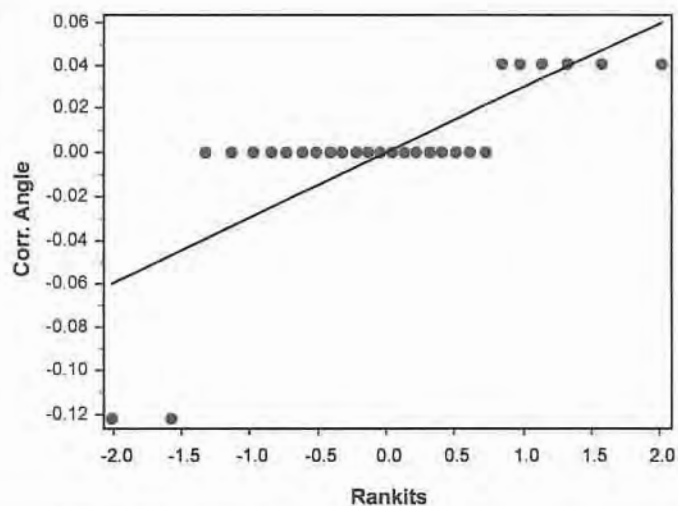
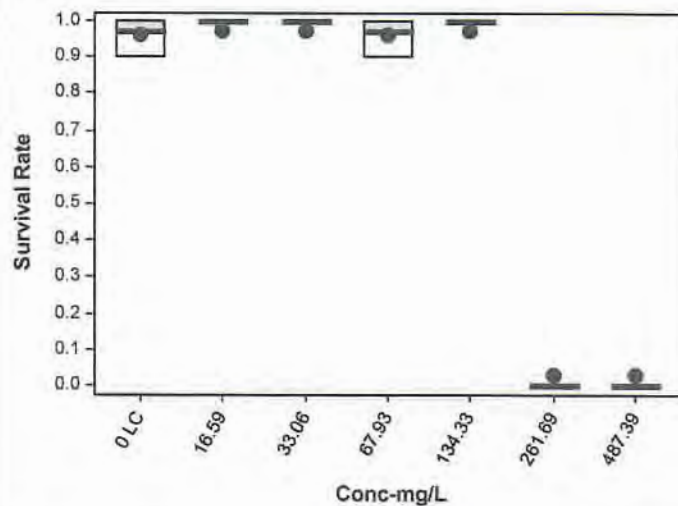
Report Date: 02 Apr-25 11:56 (p 2 of 2)
Test Code/ID: 230829eeraNH3 / 10-2817-6825

Reference Toxicant 96-h Acute Survival Test

WSP Laboratory

Analysis ID: 01-5950-1205	Endpoint: Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 02 Apr-25 11:55	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 02 Apr-25 0:00	MD5 Hash: 2A4F5805CC321743160D6EF50948BBED	Editor ID: 002-883-387-8

Graphics



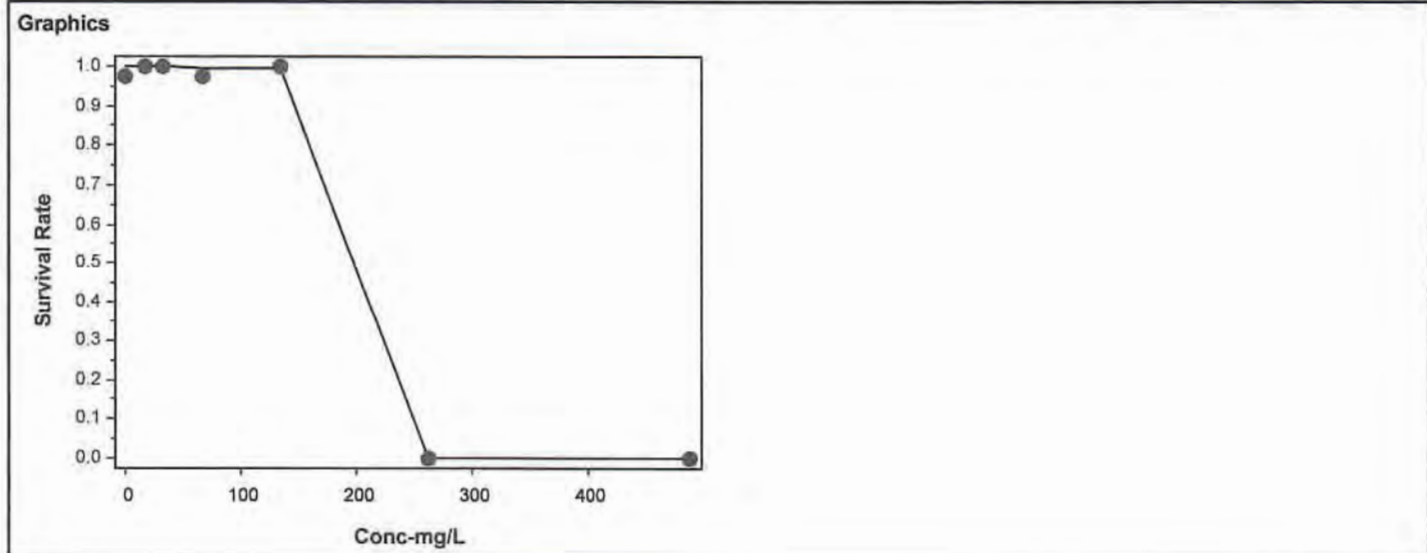
CETIS Analytical Report

Report Date: 02 Apr-25 11:56 (p 1 of 1)
Test Code/ID: 230829eeraNH3 / 10-2817-6825

Reference Toxicant 96-h Acute Survival Test				WSP Laboratory			
Analysis ID: 07-5789-0586	Endpoint: Survival Rate	CETIS Version: CETIS v2.1.5					
Analyzed: 02 Apr-25 11:55	Analysis: Untrimmed Spearman-Kärber	Status Level: 1					
Edit Date: 02 Apr-25 0:00	MD5 Hash: 2A4F5805CC321743160D6EF50948BBED	Editor ID: 002-883-387-8					
Batch ID: 20-1626-5564	Test Type: Survival	Analyst:					
Start Date: 29 Aug-23 10:30	Protocol: EPA/600/R-94/025 (1994)	Diluent: Diluted Natural Seawater					
Ending Date: 02 Sep-23 09:30	Species: Eohaustorius estuarius	Brine: Not Applicable					
Test Length: 95h	Taxon:	Source: Northwest Amphipod, OR		Age:			
Sample ID: 19-7070-5086	Code: 230829eeraNH3	Project:					
Sample Date: 29 Aug-23	Material: Total Ammonia	Source: Reference Toxicant					
Receipt Date: 29 Aug-23	CAS (PC):	Station:					
Sample Age: 10h	Client: Internal						

Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	LC50	95% LCL	95% UCL
Control Threshold	0.025	0.00%	2.27	0.00432	186.4	182.7	190.2

Survival Rate Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-mg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	LC	4	0.9750	1.0000	0.9000	1.0000	5.13%	0.00%	39/40	0.9917	0.00%
16.59		4	1.0000	1.0000	1.0000	1.0000	0.00%	-2.56%	40/40	0.9917	0.00%
33.06		4	1.0000	1.0000	1.0000	1.0000	0.00%	-2.56%	40/40	0.9917	0.00%
67.93		4	0.9750	1.0000	0.9000	1.0000	5.13%	0.00%	39/40	0.9875	0.42%
134.33		4	1.0000	1.0000	1.0000	1.0000	0.00%	-2.56%	40/40	0.9875	0.42%
261.69		4	0.0000	0.0000	0.0000	0.0000	—	100.00%	0/40	0.0000	100.00%
487.39		4	0.0000	0.0000	0.0000	0.0000	—	100.00%	0/40	0.0000	100.00%



CETIS Summary Report

Report Date: 02 Apr-25 11:56 (p 1 of 1)
Test Code/ID: 230829eeraNH3 / 10-2817-6825

Reference Toxicant 96-h Acute Survival Test

WSP Laboratory

Batch ID: 20-1626-5564	Test Type: Survival	Analyst:
Start Date: 29 Aug-23 10:30	Protocol: EPA/600/R-94/025 (1994)	Diluent: Diluted Natural Seawater
Ending Date: 02 Sep-23 09:30	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 95h	Taxon:	Source: Northwest Amphipod,OR Age:

Sample ID: 19-7070-5086	Code: 230829eeraNH3	Project:
Sample Date: 29 Aug-23	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 29 Aug-23	CAS (PC):	Station:
Sample Age: 10h	Client: Internal	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD
01-5950-1205	Survival Rate	Steel Many-One Rank Sum Test	134.33	261.69	187.5	4.99%

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL
07-5789-0586	Survival Rate	Spearman-Kärber	LC50	186.4	182.7	190.2

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	0.00%
16.59		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.56%
33.06		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.56%
67.93		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	0.00%
134.33		4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-2.56%
261.69		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	—	100.00%
487.39		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	—	100.00%

Survival Rate Detail

MD5: 2A4F5805CC321743160D6EF50948BBED

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	LC	0.9000	1.0000	1.0000	1.0000
16.59		1.0000	1.0000	1.0000	1.0000
33.06		1.0000	1.0000	1.0000	1.0000
67.93		1.0000	0.9000	1.0000	1.0000
134.33		1.0000	1.0000	1.0000	1.0000
261.69		0.0000	0.0000	0.0000	0.0000
487.39		0.0000	0.0000	0.0000	0.0000

Reference Toxicant 96-h Acute Survival Test

All Matching Labs

Test Type: Survival

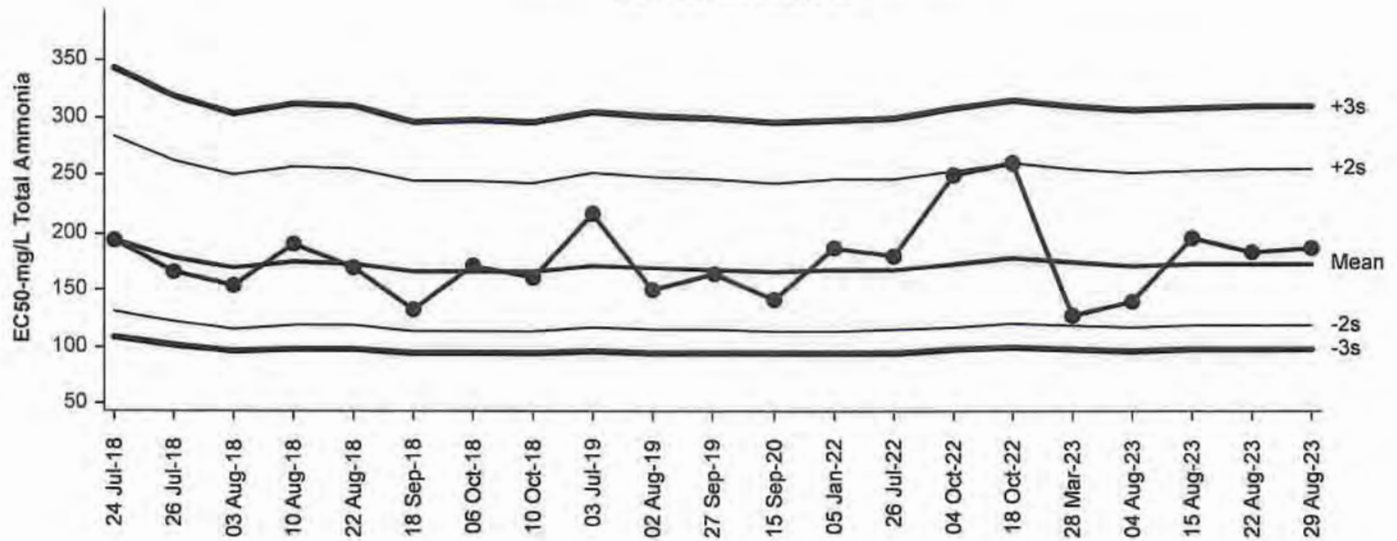
Organism: Eohaustorius estuarius

Material: Total Ammonia

Protocol: EPA/600/R-94/025 (1994)

Endpoint: Survival Rate

Source: Reference Toxicant-REF

Reference Toxicant 96-h Acute Survival Test
Survival Rate Endpoint

Mean: 173.8

Count: 20

-2s Warning Limit: 118

-3s Action Limit: 97.7

Sigma: NA

CV: 19.40%

+2s Warning Limit: 255

+3s Action Limit: 309

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2018	Jul	24	15:00	193.5	19.64	0.5574			15-3046-7177	07-7640-7637	Wood E&IS
2			26	16:00	165.7	-8.119	-0.2492			20-1199-2155	06-4886-8502	Wood E&IS
3		Aug	3	17:30	153.5	-20.32	-0.6475			19-4551-1093	09-4084-7224	Wood E&IS
4			10	14:00	191.3	17.5	0.4997			02-1422-9338	07-4510-0224	Wood E&IS
5			22	12:50	169.1	-4.761	-0.1446			13-3972-1221	10-4694-7981	Wood E&IS
6		Sep	18	13:45	133.3	-40.52	-1.383			03-9292-6241	11-0295-8556	Wood E&IS
7		Oct	6	15:30	171	-2.863	-0.0865			08-6045-8534	01-4335-0007	Wood E&IS
8			10	13:15	161.5	-12.34	-0.3835			08-2532-3011	06-6044-8622	Wood E&IS
9	2019	Jul	3	15:00	217.5	43.65	1.167			19-8627-5111	03-2795-7879	Wood E&IS
10		Aug	2	16:20	149.7	-24.16	-0.7794			10-1458-6313	20-1198-1922	Wood E&IS
11		Sep	27	16:30	164.8	-9.06	-0.2788			13-3401-8110	09-3881-8548	Wood E&IS
12	2020		15	13:30	141.4	-32.37	-1.073			02-0308-2638	10-0008-1818	Wood E&IS
13	2022	Jan	5	14:30	187.6	13.77	0.3971			02-1174-7854	11-1256-1947	Wood E&IS
14		Jul	26	17:00	179.5	5.693	0.1678			15-2681-1039	18-7248-3159	Wood E&IS
15		Oct	4	16:50	250.6	76.75	1.905			12-5994-4968	10-4632-4356	Wood E&IS
16			18	0:00	261.3	87.47	2.123	(+)		18-6334-4102	01-6647-8236	Wood E&IS
17	2023	Mar	28	15:30	128	-45.78	-1.592			02-2479-2872	05-9533-9305	WSP Laboratory
18		Aug	4	14:30	139.6	-34.22	-1.142			07-2916-3154	12-5306-1149	WSP Laboratory
19			15	16:00	196.8	23.03	0.6481			10-7396-0839	04-9129-4472	WSP Laboratory
20			22	14:00	184.4	10.55	0.307			16-5257-3809	08-1299-1791	WSP Laboratory
21			29	10:30	186.4	12.59	0.3643			10-2817-6825	18-5030-6773	WSP Laboratory

96hr Static Acute Amphipod Test

Client: Internal
Project ID: NH₃ Reftox
Test No. 230829eeraNH3

Test Species: *E. estuarius*
Start Date/Time: 8/29/2023 1030
End Date/Time: 9/2/2023 0930

Concentration (mg/L)	Rep	Counts					Water Quality					
		0	24	48	72	96	Parameter	0	24	48	72	96
Lab Control (1.00) (1.22) (1.22)	A	10				9	Temp. (°C)	15.2	14.3	14.7	15.4	15.3
	B	10				10	Salinity (ppt)	30.3		29.5		29.8
	C	10				10	pH (units)	7.85		7.50		7.46
	D	10				10	DO (mg/L)	7.7		6.4		7.1
15.6 (16.6)	A	10				10	Temp. (°C)	15.2	14.2	14.2	15.3	15.2
	B	10				10	Salinity (ppt)	30.3		29.6		29.9
	C	10				10	pH (units)	7.81		7.51		7.51
	D	10				10	DO (mg/L)	7.8		6.8		7.3
31.2 RV (27.7) 33.1	A	10				10	Temp. (°C)	15.2	14.2	14.2	15.1	15.1
	B	10				10	Salinity (ppt)	30.0		29.7		30.0
	C	10				10	pH (units)	7.76		7.51		7.51
	D	10				10	DO (mg/L)	7.8		7.2		7.4
62.5 RV (55.6) 67.9	A	10				10	Temp. (°C)	15.2	14.2	14.1	15.1	15.2
	B	10				9	Salinity (ppt)	29.8		29.5		30.0
	C	10				10	pH (units)	7.69		7.50		7.52
	D	10				10	DO (mg/L)	7.8		7.4		7.4
125 RV (110.1) 134.3	A	10				10	Temp. (°C)	15.2	14.2	14.1	14.9	15.0
	B	10				10	Salinity (ppt)	30.1		30.0		30.1
	C	10				10	pH (units)	7.57		7.49		7.51
	D	10				10	DO (mg/L)	7.9		7.4		7.4
250 RV (214.5) 261.7	A	10				0	Temp. (°C)	15.2	14.1	14.1	14.8	15.1
	B	10				0	Salinity (ppt)	30.6		30.5		30.6
	C	10				0	pH (units)	7.44		7.44		7.48
	D	10				0	DO (mg/L)	7.9		7.4		7.5
500 RV (399.5) 487.4	A	10				0	Temp. (°C)	15.0	14.0	14.0	14.5	15.0
	B	10				0	Salinity (ppt)	31.5		31.2		31.2
	C	10				0	pH (units)	7.26		7.35		7.41
	D	10				0	DO (mg/L)	7.9		7.3		7.5
Tech Initials: HK						HK/KYB	Tech Initials: HK KYB		KYB	KYB	KYB	KYB

QC: RV
Date Animals Received: 8/17/23
Age or Size of Animals: 3-5mm

Ammonia Subsamples Collected: Start: HK End: HK/KYB

Comments:

QC Check: RV 11/18/23 datasheet: RV Final Review: AG 12/21/23

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: *E. estuarius*

Project ID: NH3 Reference Toxicant

Start Date: 8/29/2023 1030

Test No.: ~~NH3~~230829eeraNH3

End Date: 9/8/2023 0930

DI Blank: 0.0

10 mg/L Ammonia Stock: 10.1

(x1.22)

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments: 1-12 mg/L

QC Check: RV 11/8/22

Final Review: 11/6/21/23

[illegible]

Amphipod Reference Toxicant

96-hr Survival

9/12/23

CETIS Summary Report

Report Date: 08 Apr-25 16:27 (p 1 of 1)
Test Code/ID: 230912eeraNH3 / 00-0209-1347

Reference Toxicant 96-h Acute Survival Test

WSP Laboratory

Batch ID: 10-4540-8646	Test Type: Survival	Analyst:
Start Date: 12 Sep-23 12:25	Protocol: EPA/600/R-94/025 (1994)	Diluent: Diluted Natural Seawater
Ending Date: 14 Sep-23 12:15	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 48h	Taxon:	Source: Northwest Amphipod,OR Age:

Sample ID: 02-2915-3694	Code: 230912eeraNH3	Project:
Sample Date: 12 Sep-23	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 12 Sep-23	CAS (PC):	Station:
Sample Age: 12h	Client: Internal	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD
06-9471-0510	Survival Rate	Steel Many-One Rank Sum Test	111.02	228.14	159.1	10.1%

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL
05-8457-0064	Survival Rate	Trimmed Spearman-Kärber	LC50	161.2	140	185.6

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	4	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
14.52		4	0.9750	0.8954	1.0550	0.9000	1.0000	0.0250	0.0500	5.13%	2.50%
28.3		4	0.9500	0.8581	1.0420	0.9000	1.0000	0.0289	0.0577	6.08%	5.00%
56.12		4	0.9000	0.7701	1.0300	0.8000	1.0000	0.0408	0.0817	9.07%	10.00%
111.02		4	0.9250	0.7727	1.0770	0.8000	1.0000	0.0479	0.0957	10.35%	7.50%
228.14		4	0.2000	0.0701	0.3299	0.1000	0.3000	0.0408	0.0817	40.82%	80.00%
453.84		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	—	100.00%

Survival Rate Detail

MD5: A71DE9FDAE6818BEC4D0B87885750407

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	LC	1.0000	1.0000	1.0000	1.0000
14.52		1.0000	0.9000	1.0000	1.0000
28.3		0.9000	1.0000	1.0000	0.9000
56.12		1.0000	0.8000	0.9000	0.9000
111.02		0.8000	0.9000	1.0000	1.0000
228.14		0.2000	0.2000	0.3000	0.1000
453.84		0.0000	0.0000	0.0000	0.0000

CETIS Analytical Report

 Report Date: 08 Apr-25 16:27 (p 1 of 2)
 Test Code/ID: 230912eeraNH3 / 00-0209-1347

Reference Toxicant 96-h Acute Survival Test										WSP Laboratory		
Analysis ID: 06-9471-0510			Endpoint: Survival Rate				CETIS Version: CETIS v2.1.5					
Analyzed: 08 Apr-25 16:26			Analysis: Nonparametric-Control vs Treatments				Status Level: 1					
Edit Date: 08 Apr-25 0:00			MD5 Hash: A71DE9FDAE6818BEC4D0B87885750407				Editor ID: 002-883-387-8					
Batch ID: 10-4540-8646			Test Type: Survival				Analyst:					
Start Date: 12 Sep-23 12:25			Protocol: EPA/600/R-94/025 (1994)				Diluent: Diluted Natural Seawater					
Ending Date: 14 Sep-23 12:15			Species: Eohaustorius estuarius				Brine: Not Applicable					
Test Length: 48h			Taxon:				Source: Northwest Amphipod,OR		Age:			
Sample ID: 02-2915-3694			Code: 230912eeraNH3				Project:					
Sample Date: 12 Sep-23			Material: Total Ammonia				Source: Reference Toxicant					
Receipt Date: 12 Sep-23			CAS (PC):				Station:					
Sample Age: 12h			Client: Internal									
Data Transform		Alt Hyp		NOEL		LOEL		TOEL		Tox Units	MSDu	PMSD
Angular (Corrected)		C > T		111.02		228.14		159.1		---	0.1013	10.13%
Steel Many-One Rank Sum Test												
Control	vs	Conc-mg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)			
Lab Control		14.52	6	16	10	1	CDF	0.6451	Non-Significant Effect			
		28.3	6	14	10	1	CDF	0.3760	Non-Significant Effect			
		56.12	6	12	10	1	CDF	0.1598	Non-Significant Effect			
		111.02	6	14	10	1	CDF	0.3760	Non-Significant Effect			
		228.14*	6	10	10	0	CDF	0.0480	Significant Effect			
		453.84*	6	10	10	0	CDF	0.0480	Significant Effect			
ANOVA Table												
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)				
Between	6.23907		1.03984		6	114.2	<1.0E-05	Significant Effect				
Error	0.191268		0.0091080		21							
Total	6.43034				27							
ANOVA Assumptions Tests												
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)				
Variance	Bartlett Equality of Variance Test							Indeterminate				
Distribution	Shapiro-Wilk W Normality Test				0.9408	0.8975	0.1155	Normal Distribution				
Survival Rate Summary												
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
0	LC	4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%	
14.52		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	2.50%	
28.3		4	0.9500	0.8581	1.0000	0.9500	0.9000	1.0000	0.0289	6.08%	5.00%	
56.12		4	0.9000	0.7701	1.0000	0.9000	0.8000	1.0000	0.0408	9.07%	10.00%	
111.02		4	0.9250	0.7727	1.0000	0.9500	0.8000	1.0000	0.0479	10.35%	7.50%	
228.14		4	0.2000	0.0701	0.3299	0.2000	0.1000	0.3000	0.0408	40.82%	80.00%	
453.84		4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	---	100.00%	
Angular (Corrected) Transformed Summary												
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
0	LC	4	1.4120	1.4120	1.4120	1.4120	1.4120	1.4120	0.0000	0.00%	0.00%	
14.52		4	1.3710	1.2420	1.5010	1.4120	1.2490	1.4120	0.0407	5.94%	2.89%	
28.3		4	1.3310	1.1810	1.4800	1.3310	1.2490	1.4120	0.0471	7.07%	5.77%	
56.12		4	1.2540	1.0560	1.4530	1.2490	1.1070	1.4120	0.0623	9.93%	11.17%	
111.02		4	1.2950	1.0610	1.5290	1.3310	1.1070	1.4120	0.0735	11.35%	8.28%	
228.14		4	0.4572	0.2892	0.6251	0.4636	0.3218	0.5796	0.0528	23.09%	67.62%	
453.84		4	0.1588	0.1588	0.1588	0.1588	0.1588	0.1588	0.0000	0.00%	88.76%	

CETIS Analytical Report

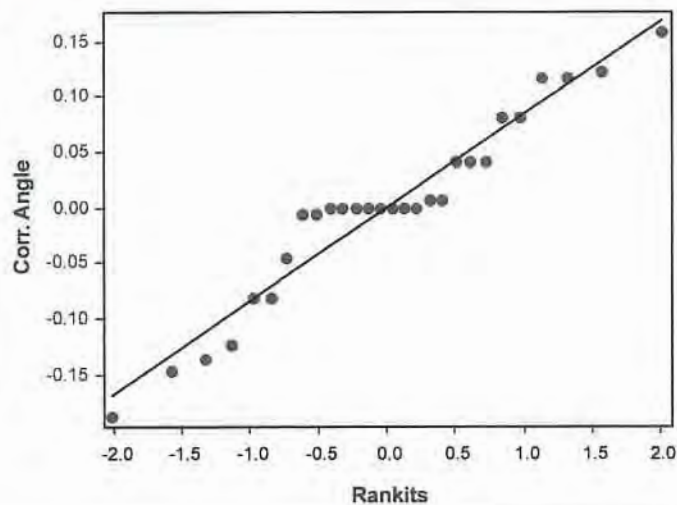
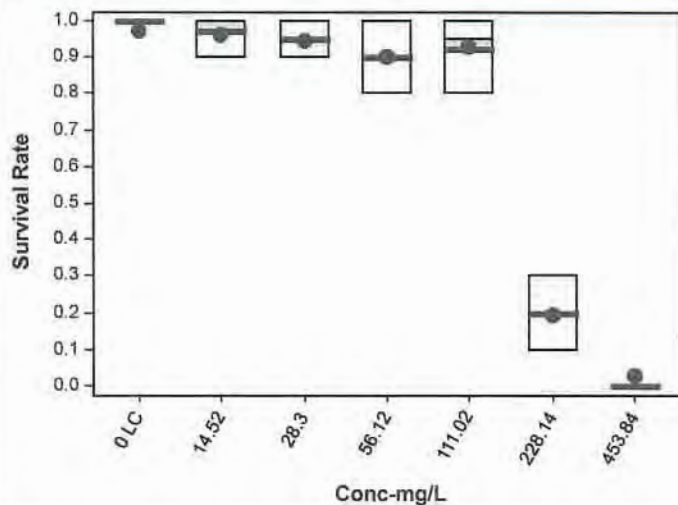
Report Date: 08 Apr-25 16:27 (p 2 of 2)
Test Code/ID: 230912eeraNH3 / 00-0209-1347

Reference Toxicant 96-h Acute Survival Test

WSP Laboratory

Analysis ID: 06-9471-0510	Endpoint: Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 08 Apr-25 16:26	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 08 Apr-25 0:00	MD5 Hash: A71DE9FDAE6818BEC4D0B87885750407	Editor ID: 002-883-387-8

Graphics



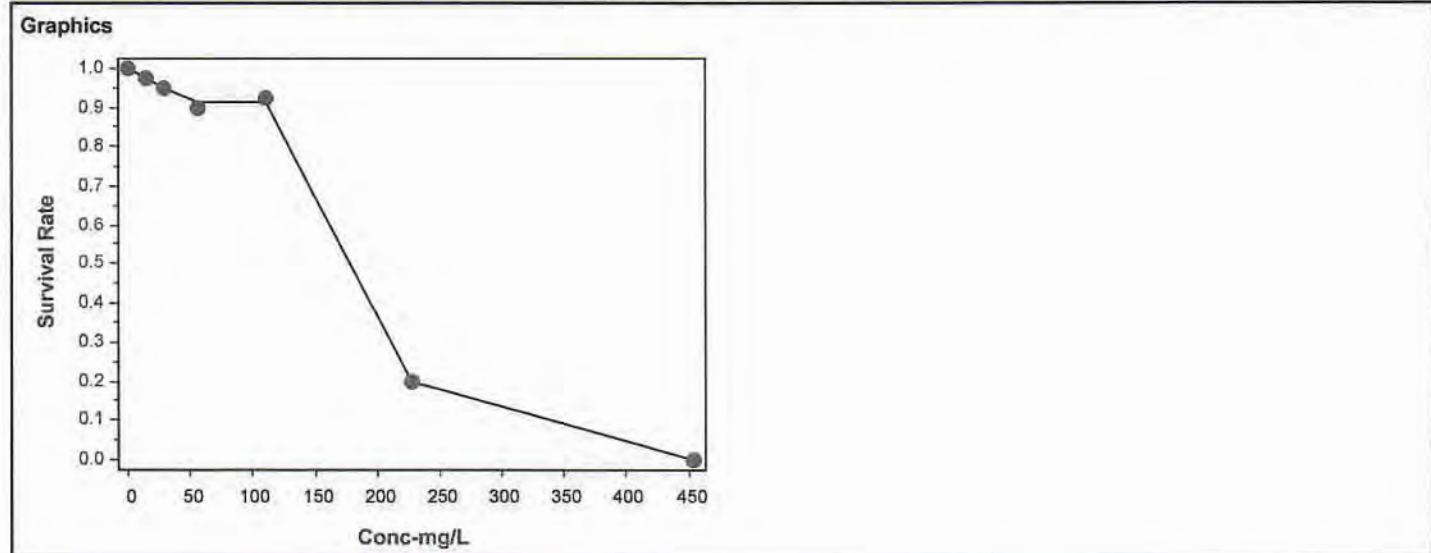
CETIS Analytical Report

Report Date: 08 Apr-25 16:27 (p 1 of 1)
Test Code/ID: 230912eeraNH3 / 00-0209-1347

Reference Toxicant 96-h Acute Survival Test				WSP Laboratory	
Analysis ID: 05-8457-0064	Endpoint: Survival Rate	CETIS Version: CETIS v2.1.5			
Analyzed: 08 Apr-25 16:26	Analysis: Trimmed Spearman-Kärber	Status Level: 1			
Edit Date: 08 Apr-25 0:00	MD5 Hash: A71DE9FDAE6818BEC4D0B87885750407	Editor ID: 002-883-387-8			
Batch ID: 10-4540-8646	Test Type: Survival	Analyst:			
Start Date: 12 Sep-23 12:25	Protocol: EPA/600/R-94/025 (1994)	Diluent: Diluted Natural Seawater			
Ending Date: 14 Sep-23 12:15	Species: Eohaustorius estuarius	Brine: Not Applicable			
Test Length: 48h	Taxon:	Source: Northwest Amphipod, OR		Age:	
Sample ID: 02-2915-3694	Code: 230912eeraNH3	Project:			
Sample Date: 12 Sep-23	Material: Total Ammonia	Source: Reference Toxicant			
Receipt Date: 12 Sep-23	CAS (PC):	Station:			
Sample Age: 12h	Client: Internal				

Trimmed Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	LC50	95% LCL	95% UCL
Control Threshold	0	2.50%	2.207	0.03059	161.2	140	185.6

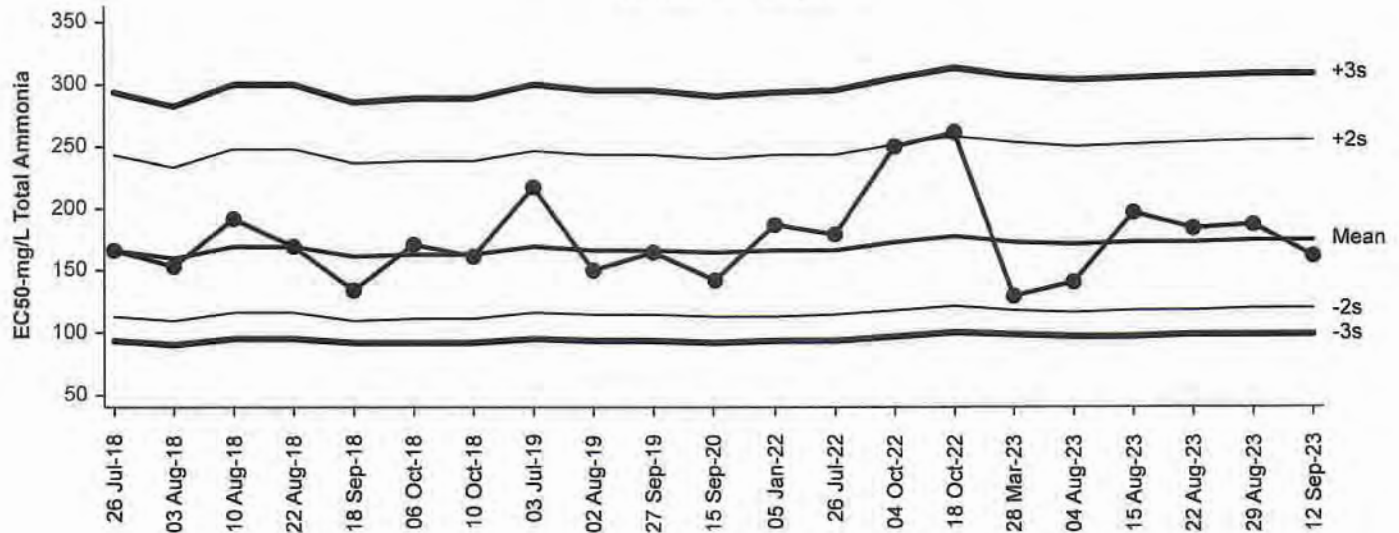
Survival Rate Summary			Calculated Variate(A/B)							Isotonic Variate	
Conc-mg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	LC	4	1.0000	1.0000	1.0000	1.0000	0.00%	0.00%	40/40	1.0000	0.00%
14.52		4	0.9750	1.0000	0.9000	1.0000	5.13%	2.50%	39/40	0.9750	2.50%
28.3		4	0.9500	0.9500	0.9000	1.0000	6.08%	5.00%	38/40	0.9500	5.00%
56.12		4	0.9000	0.9000	0.8000	1.0000	9.07%	10.00%	36/40	0.9125	8.75%
111.02		4	0.9250	0.9500	0.8000	1.0000	10.35%	7.50%	37/40	0.9125	8.75%
228.14		4	0.2000	0.2000	0.1000	0.3000	40.82%	80.00%	8/40	0.2000	80.00%
453.84		4	0.0000	0.0000	0.0000	0.0000	---	100.00%	0/40	0.0000	100.00%



Reference Toxicant 96-h Acute Survival Test

All Matching Labs

Test Type: Survival Organism: Eohaustorius estuarius Material: Total Ammonia
 Protocol: EPA/600/R-94/025 (1994) Endpoint: Survival Rate Source: Reference Toxicant-REF

Reference Toxicant 96-h Acute Survival Test
Survival Rate Endpoint

Lognormal Cumulative Mean Plot

Mean: 173.5 Count: 20 -2s Warning Limit: 118 -3s Action Limit: 97.8
 Sigma: NA CV: 19.30% +2s Warning Limit: 254 +3s Action Limit: 308

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2018	Jul	26	16:00	165.7	-7.772	-0.2399			20-1199-2155	06-4886-8502	Wood E&IS
2		Aug	3	17:30	153.5	-19.97	-0.64			19-4551-1093	09-4084-7224	Wood E&IS
3			10	14:00	191.3	17.85	0.5126			02-1422-9338	07-4510-0224	Wood E&IS
4			22	12:50	169.1	-4.413	-0.1349			13-3972-1221	10-4694-7981	Wood E&IS
5		Sep	18	13:45	133.3	-40.18	-1.379			03-9292-6241	11-0295-8556	Wood E&IS
6		Oct	6	15:30	171	-2.516	-0.07644			08-6045-8534	01-4335-0007	Wood E&IS
7			10	13:15	161.5	-11.99	-0.3748			08-2532-3011	06-6044-8622	Wood E&IS
8	2019	Jul	3	15:00	217.5	44	1.183			19-8627-5111	03-2795-7879	Wood E&IS
9		Aug	2	16:20	149.7	-23.81	-0.7726			10-1458-6313	20-1198-1922	Wood E&IS
10		Sep	27	16:30	164.8	-8.713	-0.2697			13-3401-8110	09-3881-8548	Wood E&IS
11	2020		15	13:30	141.4	-32.02	-1.068			02-0308-2638	10-0008-1818	Wood E&IS
12	2022	Jan	5	14:30	187.6	14.12	0.4094			02-1174-7854	11-1256-1947	Wood E&IS
13		Jul	26	17:00	179.5	6.04	0.1791			15-2681-1039	18-7248-3159	Wood E&IS
14		Oct	4	16:50	250.6	77.09	1.924			12-5994-4968	10-4632-4356	Wood E&IS
15			18	0:00	261.3	87.82	2.143	(+)		18-6334-4102	01-6647-8236	Wood E&IS
16	2023	Mar	28	15:30	128	-45.44	-1.589			02-2479-2872	05-9533-9305	WSP Laboratory
17		Aug	4	14:30	139.6	-33.88	-1.137			07-2916-3154	12-5306-1149	WSP Laboratory
18			15	16:00	196.8	23.38	0.6616			10-7396-0839	04-9129-4472	WSP Laboratory
19			22	14:00	184.4	10.9	0.319			16-5257-3809	08-1299-1791	WSP Laboratory
20			29	10:30	186.4	12.94	0.3765			10-2817-6825	18-5030-6773	WSP Laboratory
21		Sep	12	12:25	161.2	-12.26	-0.3835			00-0209-1347	16-4362-1179	WSP Laboratory

96hr Static Acute Amphipod Test

Client: Internal

Test Species: *E. estuarius*

Project ID: NH3 Reference Toxicant

Start Date/Time: 9/12/2023 1225

Test No. 230914 ² ~~ceera~~ NH3

End Date/Time: 9/14/2023 1215

Sample ID (mg/L)	Rep	Counts						Water Quality					
		0	24	48	72	96		Parameter	0	24	48	72	96
LC (2.44)	A	10				10	JF	Temp. (°C)	15.8	14.6	15.1	14.6	15.1
	B	10				10		Salinity (ppt)	31.7		31.8		31.6
	C	10				10		pH (units)	7.88		7.68		7.63
	D	10				10		DO (mg/L)	7.7	8.7	7.2		7.8
15.625 (14.52)	A	10				10		Temp. (°C)	15.8	14.6	14.8	14.7	14.8
	B	10				9		Salinity (ppt)	31.9		32.0		32.0
	C	10				9		pH (units)	7.85		7.69		7.62
	D	10				10		DO (mg/L)	7.6		7.4		7.7
31.25 (28.30)	A	10				9		Temp. (°C)	15.9	14.4	14.9	14.7	14.7
	B	10				10		Salinity (ppt)	31.9		31.9		32.0
	C	10				10		pH (units)	7.81		7.69		7.63
	D	10				9		DO (mg/L)	7.7		7.5		7.8
62.5 (54.12)	A	10				10		Temp. (°C)	15.9	14.4	14.7	14.7	14.7
	B	10				8		Salinity (ppt)	32.0		31.1		32.3
	C	10				9		pH (units)	7.76		7.68		7.63
	D	10				9		DO (mg/L)	7.7		7.6		7.8
125 (111.02)	A	10				8		Temp. (°C)	15.9	14.4	14.6	14.6	14.6
	B	10				9		Salinity (ppt)	32.2		32.3		32.4
	C	10				10		pH (units)	7.66		7.65		7.61
	D	10				10		DO (mg/L)	7.7		7.7		7.9
250 (228.14)	A	10				2	Temp. (°C)	15.9	14.4	14.6	14.6	14.6	
	B	10				2	Salinity (ppt)	32.5		32.7		32.8	
	C	10				3	pH (units)	7.52		7.59		7.56	
	D	10				1	DO (mg/L)	7.7		7.7		7.8	
500 (453.84)	A	10				0	Temp. (°C)	15.9	14.3	14.5	14.5	14.5	
	B	10				0	Salinity (ppt)	33.0		33.3		33.5	
	C	10				0	pH (units)	7.36		7.51		7.48	
	D	10				0	DO (mg/L)	7.7		7.7		7.5	
Tech Initials:		HK				JF	Tech Initials:		AB	KYB	HK	KYB	JF

Date Animals Received: 8/31/2023

Ammonia Subsamples Taken: Start: AB

End: JF

Age or Size of Animals: 3-5 mm

Comments:

QC Check: AB 12/21/23

Final Review: Mmm

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Project ID: NH3 Reftox

Test No.: 230912eeraNH3

Test Species: *E. estuarius*

Start Date: 9/12/2023 1225

End Date: 9/16/2023 1215

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.93

(x1.22)

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check: AG 12/21/23

Final Review:

B23_Eoh Reflox Unionized LC Redefined

[illegible]

Bivalve Reference Toxicant
48-hr Survival & Development
8/16/23

CETIS Summary Report

Report Date: 02 Apr-25 09:58 (p 1 of 2)
Test Code/ID: 230816mgrdNH3 / 10-1256-9161

Bivalve Larval Survival and Development Test

WSP Laboratory

Batch ID: 13-5513-7577	Test Type: Development-Survival	Analyst:
Start Date: 16 Aug-23 15:15	Protocol: EPA/600/R-95/136 (1995)	Diluent: Diluted Natural Seawater
Ending Date: 18 Aug-23 16:00	Species: Mytilus galloprovincialis	Brine: Not Applicable
Test Length: 49h	Taxon:	Source: Field Collected Age:
Sample ID: 12-5495-9693	Code: 230816mgrdNH3	Project:
Sample Date: 16 Aug-23	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 16 Aug-23	CAS (PC):	Station:
Sample Age: 15h	Client: Internal	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD
00-8446-6779	Combined Proportion Normal	Dunnett Multiple Comparison Test	7.32	8.42	7.851	5.79%
20-1979-0156	Proportion Normal	Dunnett Multiple Comparison Test	3.29	5.49	4.25	4.67%
19-2281-0681	Survival Rate	Steel Many-One Rank Sum Test	16.6	>16.6	---	3.46%

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL
02-4959-0000	Combined Proportion Normal	Trimmed Spearman-Kärber	EC50	11.42	11.32	11.52

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
20-1979-0156	Proportion Normal	Control Resp	0.8294	0.9	>>	Yes	Below Criteria
19-2281-0681	Survival Rate	Control Resp	0.9844	0.5	>>	Yes	Passes Criteria
00-8446-6779	Combined Proportion Normal	PMSD	0.05791	<<	0.25	No	Passes Criteria

Combined Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	0.8166	0.7807	0.8526	0.7667	0.8395	0.0129	0.0289	3.54%	0.00%
1.71		5	0.7894	0.7741	0.8047	0.7749	0.8071	0.0055	0.0123	1.56%	3.33%
3.29		5	0.7926	0.7597	0.8255	0.7629	0.8309	0.0119	0.0265	3.34%	2.94%
5.49		5	0.7685	0.7062	0.8309	0.6926	0.8147	0.0225	0.0502	6.53%	5.89%
7.32		5	0.7771	0.7411	0.8131	0.7444	0.8087	0.0130	0.0290	3.73%	4.84%
8.42		5	0.7637	0.7301	0.7973	0.7215	0.7926	0.0121	0.0271	3.54%	6.48%
16.6		5	0.0136	0.0008	0.0265	0.0034	0.0278	0.0046	0.0104	75.97%	98.33%

Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	0.8294	0.8162	0.8425	0.8150	0.8395	0.0047	0.0106	1.28%	0.00%
1.71		5	0.7894	0.7741	0.8047	0.7749	0.8071	0.0055	0.0123	1.56%	4.82%
3.29		5	0.7967	0.7664	0.8270	0.7629	0.8309	0.0109	0.0244	3.07%	3.94%
5.49		5	0.7812	0.7421	0.8204	0.7391	0.8147	0.0141	0.0315	4.04%	5.81%
7.32		5	0.7858	0.7521	0.8195	0.7482	0.8099	0.0122	0.0272	3.46%	5.25%
8.42		5	0.7708	0.7334	0.8081	0.7215	0.7946	0.0135	0.0301	3.90%	7.07%
16.6		5	0.0139	0.0011	0.0268	0.0034	0.0278	0.0046	0.0104	74.38%	98.32%

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	0.9844	0.9532	1.0160	0.9407	1.0000	0.0113	0.0252	2.56%	0.00%
1.71		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-1.58%
3.29		5	0.9948	0.9804	1.0090	0.9741	1.0000	0.0052	0.0116	1.17%	-1.05%
5.49		5	0.9830	0.9489	1.0170	0.9370	1.0000	0.0123	0.0274	2.79%	0.15%
7.32		5	0.9889	0.9699	1.0080	0.9704	1.0000	0.0068	0.0153	1.54%	-0.45%
8.42		5	0.9911	0.9664	1.0160	0.9556	1.0000	0.0089	0.0199	2.01%	-0.68%
16.6		5	0.9733	0.9298	1.0170	0.9296	1.0000	0.0157	0.0351	3.60%	1.13%

CETIS Summary Report

Report Date: 02 Apr-25 09:58 (p 2 of 2)

Test Code/ID: 230816mgrdNH3 / 10-1256-9161

Bivalve Larval Survival and Development Test

WSP Laboratory

Combined Proportion Normal Detail							MD5: 7682EC5687AB7C1148054214B8134E3F
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	LC	0.8395	0.8222	0.8333	0.7667	0.8214	
1.71		0.7930	0.8071	0.7749	0.7810	0.7909	
3.29		0.8034	0.7629	0.7917	0.7741	0.8309	
5.49		0.6926	0.7774	0.7481	0.8147	0.8097	
7.32		0.7444	0.7951	0.8087	0.7889	0.7482	
8.42		0.7643	0.7593	0.7215	0.7808	0.7926	
16.6		0.0278	0.0034	0.0037	0.0148	0.0185	
Proportion Normal Detail							MD5: 4FB34ED4A796FE11626CDA4F91B73B4F
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	LC	0.8395	0.8346	0.8364	0.8150	0.8214	
1.71		0.7930	0.8071	0.7749	0.7810	0.7909	
3.29		0.8034	0.7629	0.7917	0.7947	0.8309	
5.49		0.7391	0.7774	0.7652	0.8147	0.8097	
7.32		0.7672	0.7951	0.8087	0.8099	0.7482	
8.42		0.7643	0.7946	0.7215	0.7808	0.7926	
16.6		0.0278	0.0034	0.0039	0.0159	0.0186	
Survival Rate Detail							MD5: 5CF069AECC36A712E9361BE27C560CC8
Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	
0	LC	1.0000	0.9852	0.9963	0.9407	1.0000	
1.71		1.0000	1.0000	1.0000	1.0000	1.0000	
3.29		1.0000	1.0000	1.0000	0.9741	1.0000	
5.49		0.9370	1.0000	0.9778	1.0000	1.0000	
7.32		0.9704	1.0000	1.0000	0.9741	1.0000	
8.42		1.0000	0.9556	1.0000	1.0000	1.0000	
16.6		1.0000	1.0000	0.9407	0.9296	0.9963	

CETIS Analytical Report

Report Date: 02 Apr-25 09:58 (p 1 of 6)
Test Code/ID: 230816mgrdNH3 / 10-1256-9161

Bivalve Larval Survival and Development Test							WSP Laboratory				
Analysis ID: 00-8446-6779		Endpoint: Combined Proportion Normal			CETIS Version: CETIS v2.1.5						
Analyzed: 02 Apr-25 9:55		Analysis: Parametric-Control vs Treatments			Status Level: 1						
Edit Date: 02 Apr-25 0:00		MD5 Hash: 7682EC5687AB7C1148054214B8134E3F			Editor ID: 002-883-387-8						
Batch ID: 13-5513-7577		Test Type: Development-Survival			Analyst:						
Start Date: 16 Aug-23 15:15		Protocol: EPA/600/R-95/136 (1995)			Diluent: Diluted Natural Seawater						
Ending Date: 18 Aug-23 16:00		Species: Mytilis galloprovincialis			Brine: Not Applicable						
Test Length: 49h		Taxon:			Source: Field Collected		Age:				
Sample ID: 12-5495-9693		Code: 230816mgrdNH3			Project:						
Sample Date: 16 Aug-23		Material: Total Ammonia			Source: Reference Toxicant						
Receipt Date: 16 Aug-23		CAS (PC):			Station:						
Sample Age: 15h		Client: Internal									
Data Transform		Alt Hyp		NOEL		LOEL	TOEL	Tox Units	MSDu	PMSD	
Angular (Corrected)		C > T		7.32		8.42	7.851	---	0.04729	5.79%	
Dunnett Multiple Comparison Test											
Control	vs	Conc-mg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)		
Lab Control		1.71	8	1.42	2.407	0.05928	CDF	0.2746	Non-Significant Effect		
		3.29	8	1.24	2.407	0.05928	CDF	0.3461	Non-Significant Effect		
		5.49	8	2.378	2.407	0.05928	CDF	0.0531	Non-Significant Effect		
		7.32	8	2.006	2.407	0.05928	CDF	0.1084	Non-Significant Effect		
		8.42*	8	2.658	2.407	0.05928	CDF	0.0294	Significant Effect		
		16.6*	8	41.43	2.407	0.05928	CDF	<1.0E-05	Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	4.13252		0.688754		6	454.3	<1.0E-05	Significant Effect			
Error	0.0424462		0.0015159		28						
Total	4.17497				34						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Bartlett Equality of Variance Test				6.404	16.81	0.3794	Equal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.9708	0.9146	0.4667	Normal Distribution			
Combined Proportion Normal Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	0.8166	0.7807	0.8526	0.8222	0.7667	0.8395	0.0129	3.54%	0.00%
1.71		5	0.7894	0.7741	0.8047	0.7909	0.7749	0.8071	0.0055	1.56%	3.33%
3.29		5	0.7926	0.7597	0.8255	0.7917	0.7629	0.8309	0.0119	3.34%	2.94%
5.49		5	0.7685	0.7062	0.8309	0.7774	0.6926	0.8147	0.0225	6.53%	5.89%
7.32		5	0.7771	0.7411	0.8131	0.7889	0.7444	0.8087	0.0130	3.73%	4.84%
8.42		5	0.7637	0.7301	0.7973	0.7643	0.7215	0.7926	0.0121	3.54%	6.48%
16.6		5	0.0136	0.0008	0.0265	0.0148	0.0034	0.0278	0.0046	75.97%	98.33%
Angular (Corrected) Transformed Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	1.1290	1.0840	1.1740	1.1360	1.0670	1.1590	0.0163	3.22%	0.00%
1.71		5	1.0940	1.0750	1.1130	1.0960	1.0760	1.1160	0.0068	1.39%	3.10%
3.29		5	1.0990	1.0580	1.1400	1.0970	1.0620	1.1470	0.0148	3.01%	2.70%
5.49		5	1.0710	0.9976	1.1440	1.0790	0.9831	1.1260	0.0263	5.49%	5.19%
7.32		5	1.0800	1.0370	1.1230	1.0930	1.0410	1.1180	0.0155	3.22%	4.38%
8.42		5	1.0640	1.0240	1.1030	1.0640	1.0150	1.0980	0.0141	2.97%	5.80%
16.6		5	0.1090	0.0493	0.1687	0.1220	0.0581	0.1674	0.0215	44.13%	90.35%

CETIS Analytical Report

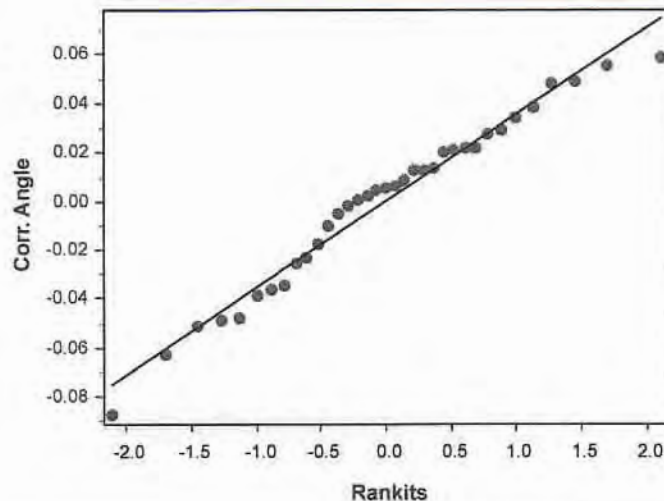
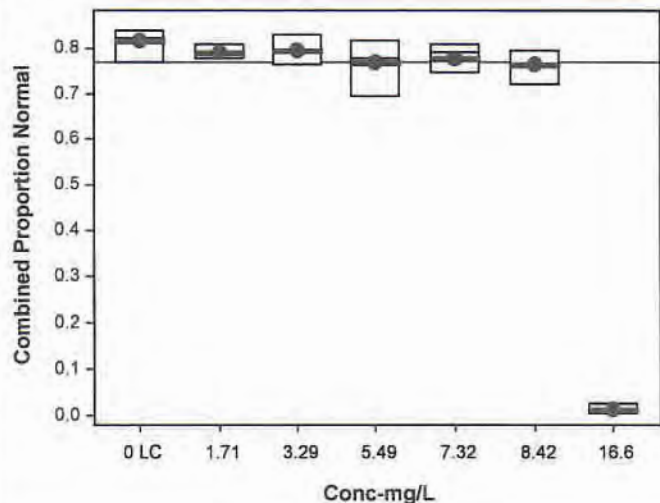
Report Date: 02 Apr-25 09:58 (p 2 of 6)
 Test Code/ID: 230816mgrdNH3 / 10-1256-9161

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 00-8446-6779 Endpoint: Combined Proportion Normal CETIS Version: CETIS v2.1.5
 Analyzed: 02 Apr-25 9:55 Analysis: Parametric-Control vs Treatments Status Level: 1
 Edit Date: 02 Apr-25 0:00 MD5 Hash: 7682EC5687AB7C1148054214B8134E3F Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

Report Date: 02 Apr-25 09:58 (p 3 of 6)
Test Code/ID: 230816mgrdNH3 / 10-1256-9161

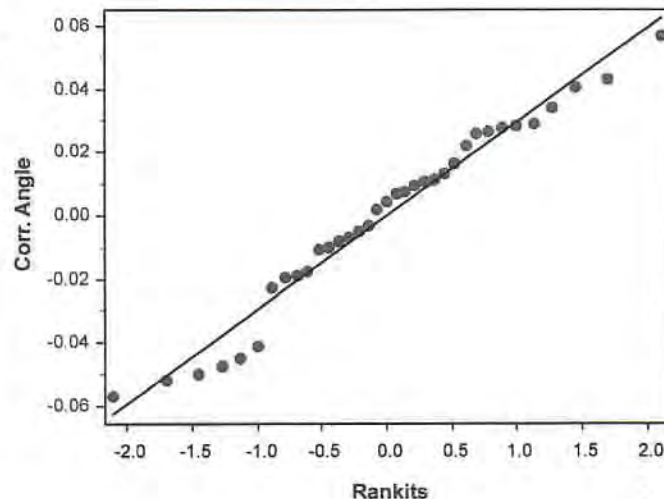
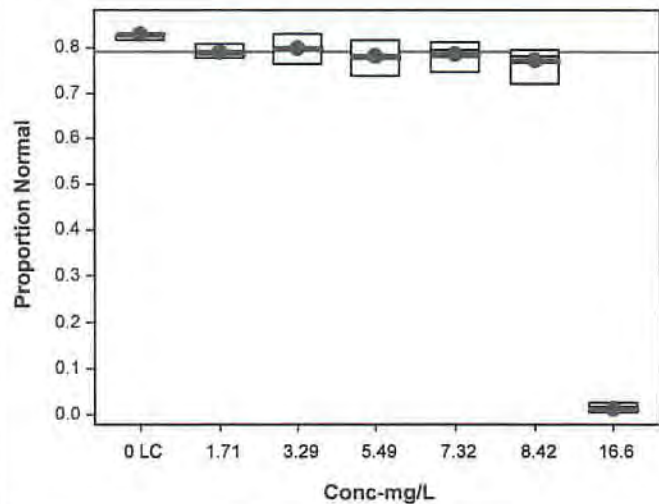
Bivalve Larval Survival and Development Test										WSP Laboratory	
Analysis ID: 20-1979-0156			Endpoint: Proportion Normal				CETIS Version: CETIS v2.1.5				
Analyzed: 02 Apr-25 9:56			Analysis: Parametric-Control vs Treatments				Status Level: 1				
Edit Date: 02 Apr-25 0:00			MD5 Hash: 4FB34ED4A796FE11626CDA4F91B73B4F				Editor ID: 002-883-387-8				
Batch ID: 13-5513-7577			Test Type: Development-Survival				Analyst:				
Start Date: 16 Aug-23 15:15			Protocol: EPA/600/R-95/136 (1995)				Diluent: Diluted Natural Seawater				
Ending Date: 18 Aug-23 16:00			Species: Mytilis galloprovincialis				Brine: Not Applicable				
Test Length: 49h			Taxon:				Source: Field Collected			Age:	
Sample ID: 12-5495-9693			Code: 230816mgrdNH3				Project:				
Sample Date: 16 Aug-23			Material: Total Ammonia				Source: Reference Toxicant				
Receipt Date: 16 Aug-23			CAS (PC):				Station:				
Sample Age: 15h			Client: Internal								
Data Transform		Alt Hyp				NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)		C > T				3.29	5.49	4.25	---	0.03876	4.67%
Dunnett Multiple Comparison Test											
Control	vs	Conc-mg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)		
Lab Control		1.71*	8	2.474	2.407	0.04959	CDF	0.0435	Significant Effect		
		3.29	8	2.016	2.407	0.04959	CDF	0.1066	Non-Significant Effect		
		5.49*	8	2.925	2.407	0.04959	CDF	0.0161	Significant Effect		
		7.32*	8	2.664	2.407	0.04959	CDF	0.0290	Significant Effect		
		8.42*	8	3.543	2.407	0.04959	CDF	0.0036	Significant Effect		
		16.6*	8	50.23	2.407	0.04959	CDF	<1.0E-05	Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	4.19946		0.69991		6	659.7	<1.0E-05	Significant Effect			
Error	0.0297076		0.001061		28						
Total	4.22917				34						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Bartlett Equality of Variance Test				7.627	16.81	0.2667	Equal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.967	0.9146	0.3653	Normal Distribution			
Proportion Normal Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	0.8294	0.8162	0.8425	0.8346	0.8150	0.8395	0.0047	1.28%	0.00%
1.71		5	0.7894	0.7741	0.8047	0.7909	0.7749	0.8071	0.0055	1.56%	4.82%
3.29		5	0.7967	0.7664	0.8270	0.7947	0.7629	0.8309	0.0109	3.07%	3.94%
5.49		5	0.7812	0.7421	0.8204	0.7774	0.7391	0.8147	0.0141	4.04%	5.81%
7.32		5	0.7858	0.7521	0.8195	0.7951	0.7482	0.8099	0.0122	3.46%	5.25%
8.42		5	0.7708	0.7334	0.8081	0.7808	0.7215	0.7946	0.0135	3.90%	7.07%
16.6		5	0.0139	0.0011	0.0268	0.0159	0.0034	0.0278	0.0046	74.38%	98.32%
Angular (Corrected) Transformed Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	1.1450	1.1280	1.1630	1.1520	1.1260	1.1590	0.0063	1.23%	0.00%
1.71		5	1.0940	1.0750	1.1130	1.0960	1.0760	1.1160	0.0068	1.39%	4.45%
3.29		5	1.1040	1.0660	1.1410	1.1010	1.0620	1.1470	0.0136	2.76%	3.63%
5.49		5	1.0850	1.0380	1.1320	1.0790	1.0350	1.1260	0.0170	3.51%	5.26%
7.32		5	1.0900	1.0490	1.1310	1.1010	1.0450	1.1200	0.0147	3.01%	4.79%
8.42		5	1.0720	1.0280	1.1160	1.0840	1.0150	1.1000	0.0157	3.28%	6.37%
16.6		5	0.1103	0.0507	0.1699	0.1266	0.0581	0.1674	0.0215	43.51%	90.37%

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 20-1979-0156	Endpoint: Proportion Normal	CETIS Version: CETIS v2.1.5
Analyzed: 02 Apr-25 9:56	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 02 Apr-25 0:00	MD5 Hash: 4FB34ED4A796FE11626CDA4F91B73B4F	Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

Report Date: 02 Apr-25 09:58 (p 5 of 6)
Test Code/ID: 230816mgrdNH3 / 10-1256-9161

Bivalve Larval Survival and Development Test										WSP Laboratory		
Analysis ID: 19-2281-0681		Endpoint: Survival Rate				CETIS Version: CETIS v2.1.5						
Analyzed: 02 Apr-25 9:56		Analysis: Nonparametric-Control vs Treatments				Status Level: 1						
Edit Date: 02 Apr-25 0:00		MD5 Hash: 5CF069AECC36A712E9361BE27C560CC8				Editor ID: 002-883-387-8						
Batch ID: 13-5513-7577		Test Type: Development-Survival				Analyst:						
Start Date: 16 Aug-23 15:15		Protocol: EPA/600/R-95/136 (1995)				Diluent: Diluted Natural Seawater						
Ending Date: 18 Aug-23 16:00		Species: Mytilis galloprovincialis				Brine: Not Applicable						
Test Length: 49h		Taxon:				Source: Field Collected		Age:				
Sample ID: 12-5495-9693		Code: 230816mgrdNH3				Project:						
Sample Date: 16 Aug-23		Material: Total Ammonia				Source: Reference Toxicant						
Receipt Date: 16 Aug-23		CAS (PC):				Station:						
Sample Age: 15h		Client: Internal										
Data Transform		Alt Hyp		NOEL		LOEL		TOEL		Tox Units	MSDu	PMSD
Angular (Corrected)		C > T		16.6		>16.6		---		---		0.03401 3.46%
Steel Many-One Rank Sum Test												
Control	vs	Conc-mg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)			
Lab Control		1.71	8	35	16	2	CDF	0.9986	Non-Significant Effect			
		3.29	8	32	16	2	CDF	0.9866	Non-Significant Effect			
		5.49	8	28	16	2	CDF	0.8838	Non-Significant Effect			
		7.32	8	29	16	2	CDF	0.9262	Non-Significant Effect			
		8.42	8	32	16	2	CDF	0.9866	Non-Significant Effect			
		16.6	8	26	16	4	CDF	0.7547	Non-Significant Effect			
ANOVA Table												
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)				
Between	0.0305468		0.0050911		6	0.7365	0.6246	Non-Significant Effect				
Error	0.193558		0.0069128		28							
Total	0.224104				34							
ANOVA Assumptions Tests												
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)				
Variance	Bartlett Equality of Variance Test							Indeterminate				
Distribution	Shapiro-Wilk W Normality Test				0.8674	0.9146	0.0006	Non-Normal Distribution				
Survival Rate Summary												
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
0	LC	5	0.9844	0.9532	1.0000	0.9963	0.9407	1.0000	0.0113	2.56%	0.00%	
1.71		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-1.58%	
3.29		5	0.9948	0.9804	1.0000	1.0000	0.9741	1.0000	0.0052	1.17%	-1.05%	
5.49		5	0.9830	0.9489	1.0000	1.0000	0.9370	1.0000	0.0123	2.79%	0.15%	
7.32		5	0.9889	0.9699	1.0000	1.0000	0.9704	1.0000	0.0068	1.54%	-0.45%	
8.42		5	0.9911	0.9664	1.0000	1.0000	0.9556	1.0000	0.0089	2.01%	-0.68%	
16.6		5	0.9733	0.9298	1.0000	0.9963	0.9296	1.0000	0.0157	3.60%	1.13%	
Angular (Corrected) Transformed Summary												
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect	
0	LC	5	1.4730	1.3600	1.5860	1.5100	1.3250	1.5400	0.0406	6.16%	0.00%	
1.71		5	1.5400	1.5400	1.5400	1.5400	1.5400	1.5400	0.0000	0.00%	-4.58%	
3.29		5	1.5140	1.4410	1.5870	1.5400	1.4090	1.5400	0.0263	3.88%	-2.80%	
5.49		5	1.4720	1.3470	1.5970	1.5400	1.3170	1.5400	0.0450	6.84%	0.07%	
7.32		5	1.4860	1.3920	1.5790	1.5400	1.3980	1.5400	0.0336	5.06%	-0.86%	
8.42		5	1.5040	1.4030	1.6050	1.5400	1.3580	1.5400	0.0364	5.41%	-2.11%	
16.6		5	1.4440	1.2950	1.5920	1.5100	1.3020	1.5400	0.0535	8.28%	1.99%	

CETIS Analytical Report

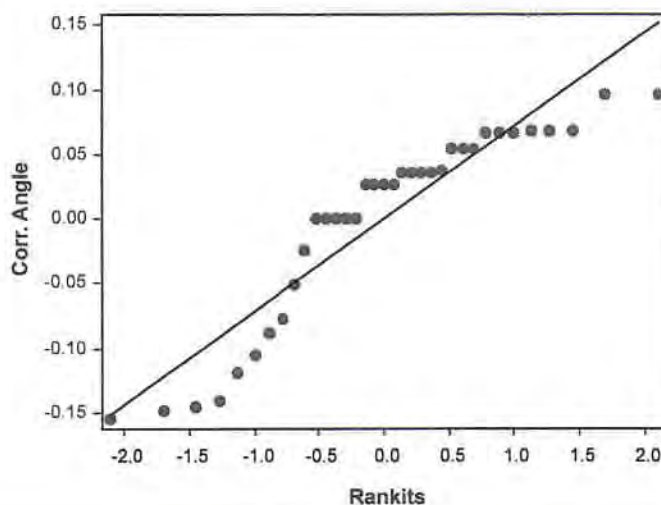
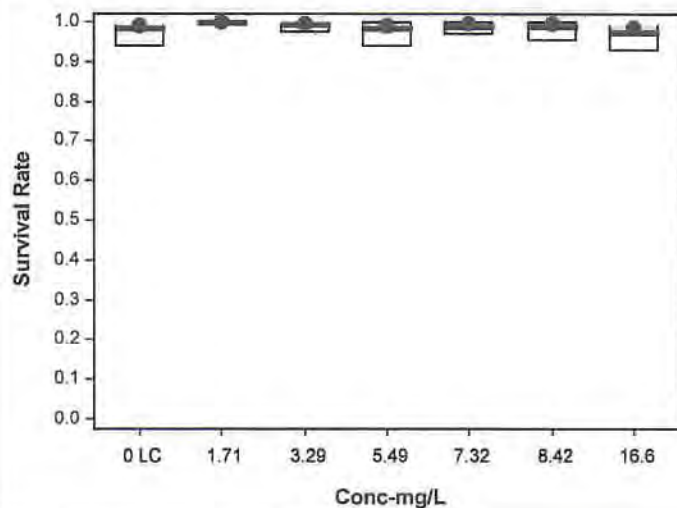
Report Date: 02 Apr-25 09:58 (p 6 of 6)
 Test Code/ID: 230816mgrdNH3 / 10-1256-9161

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 19-2281-0681 Endpoint: Survival Rate CETIS Version: CETIS v2.1.5
 Analyzed: 02 Apr-25 9:56 Analysis: Nonparametric-Control vs Treatments Status Level: 1
 Edit Date: 02 Apr-25 0:00 MD5 Hash: 5CF069AECC36A712E9361BE27C560CC8 Editor ID: 002-883-387-8

Graphics



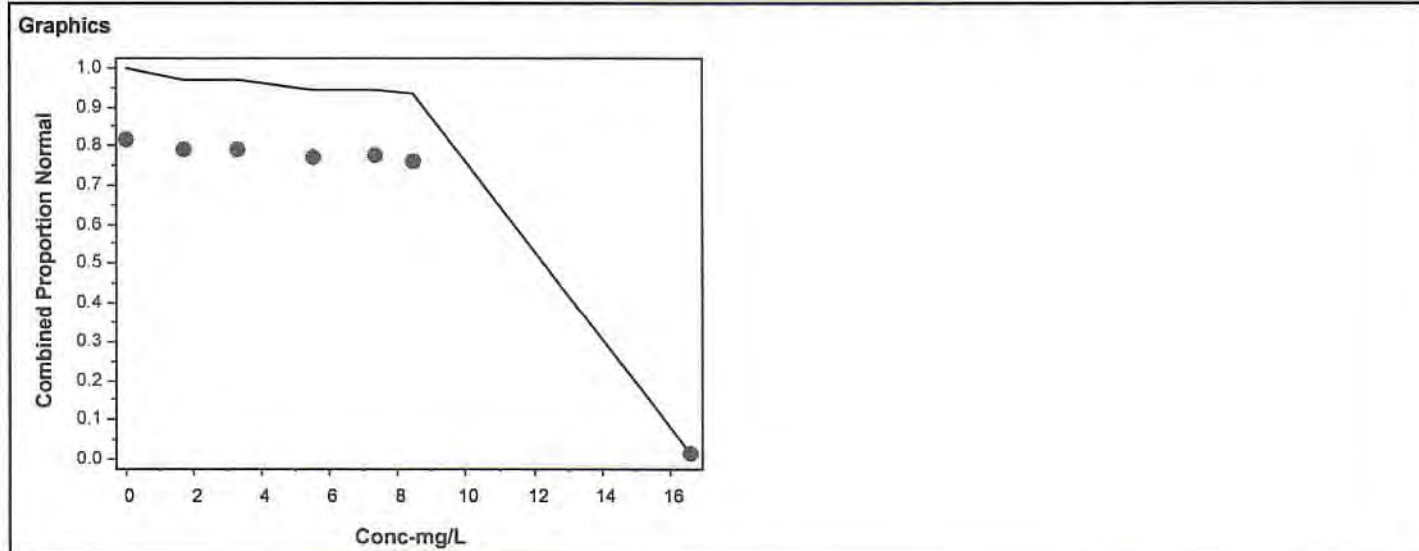
CETIS Analytical Report

Report Date: 02 Apr-25 09:58 (p 1 of 1)
Test Code/ID: 230816mgrdNH3 / 10-1256-9161

Bivalve Larval Survival and Development Test				WSP Laboratory	
Analysis ID:	02-4959-0000	Endpoint:	Combined Proportion Normal	CETIS Version:	CETIS v2.1.5
Analyzed:	02 Apr-25 9:57	Analysis:	Trimmed Spearman-Kärber	Status Level:	1
Edit Date:	02 Apr-25 0:00	MD5 Hash:	7682EC5687AB7C1148054214B8134E3F	Editor ID:	002-883-387-8
Batch ID:	13-5513-7577	Test Type:	Development-Survival	Analyst:	
Start Date:	16 Aug-23 15:15	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Diluted Natural Seawater
Ending Date:	18 Aug-23 16:00	Species:	Mytilis galloprovincialis	Brine:	Not Applicable
Test Length:	49h	Taxon:		Source:	Field Collected
					Age:
Sample ID:	12-5495-9693	Code:	230816mgrdNH3	Project:	
Sample Date:	16 Aug-23	Material:	Total Ammonia	Source:	Reference Toxicant
Receipt Date:	16 Aug-23	CAS (PC):		Station:	
Sample Age:	15h	Client:	Internal		

Trimmed Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.1829	3.19%	1.058	0.001928	11.42	11.32	11.52

Combined Proportion Normal Summary					Calculated Variate(A/B)				Isotonic Variate		
Conc-mg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	LC	5	0.8166	0.8222	0.7667	0.8395	3.54%	0.00%	1135/1389	0.8166	0.00%
1.71		5	0.7894	0.7909	0.7749	0.8071	1.56%	3.33%	1153/1460	0.7910	3.14%
3.29		5	0.7926	0.7917	0.7629	0.8309	3.34%	2.94%	1122/1416	0.7910	3.14%
5.49		5	0.7685	0.7774	0.6926	0.8147	6.53%	5.89%	1097/1425	0.7728	5.37%
7.32		5	0.7771	0.7889	0.7444	0.8087	3.73%	4.84%	1075/1383	0.7728	5.37%
8.42		5	0.7637	0.7643	0.7215	0.7926	3.54%	6.48%	1089/1427	0.7637	6.48%
16.6		5	0.0136	0.0148	0.0034	0.0278	75.97%	98.33%	19/1395	0.0136	98.33%



Bivalve Larval Survival and Development Test

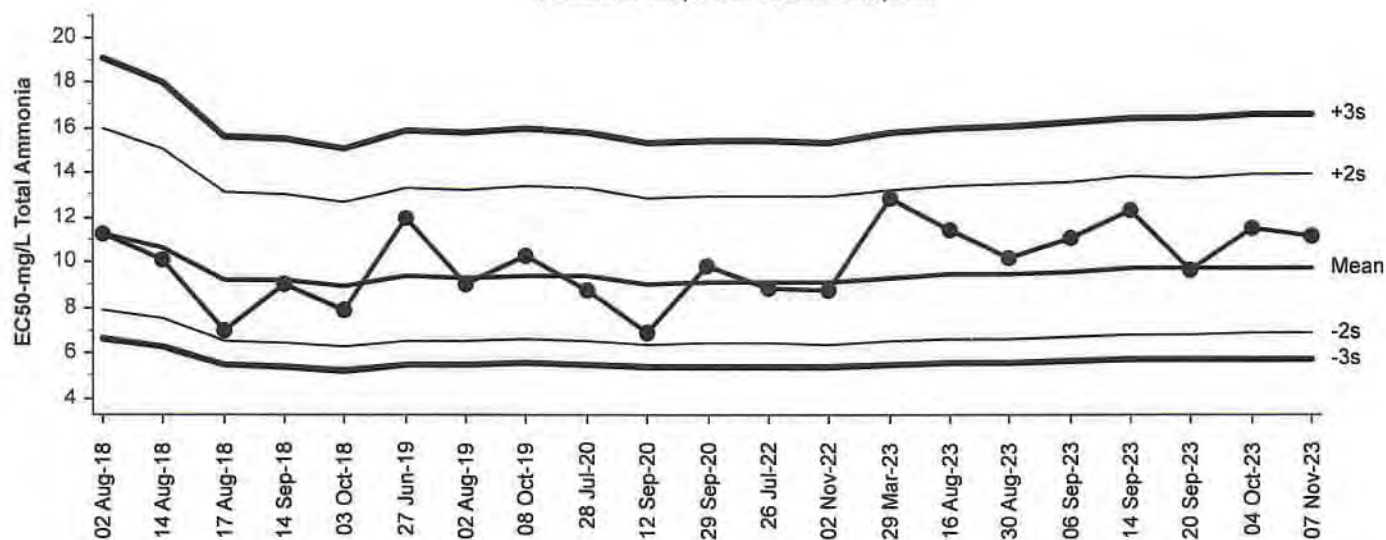
All Matching Labs

Test Type: Development-Survival
Protocol: EPA/600/R-95/136 (1995)

Organism: Mytilus galloprovincialis
Endpoint: Combined Proportion Normal

Material: Total Ammonia
Source: Reference Toxicant-REF

Bivalve Larval Survival and Development Test
Combined Proportion Normal Endpoint



Mean: 9.806

Count: 20

-2s Warning Limit: 6.91

-3s Action Limit: 5.8

Sigma: NA

CV: 17.70%

+2s Warning Limit: 13.9

+3s Action Limit: 16.6

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2018	Aug	2	14:15	11.26	1.457	0.7899			15-4398-7435	08-1276-4615	Wood E&IS
2			14	14:15	10.09	0.2812	0.1612			06-7156-7887	14-6273-7305	Wood E&IS
3			17	17:15	6.994	-2.813	-1.927			03-5411-9632	11-7669-9942	Wood E&IS
4		Sep	14	15:00	9.017	-0.789	-0.4782			17-8327-4430	05-1718-6773	Wood E&IS
5		Oct	3	15:20	7.902	-1.904	-1.231			17-8768-6287	19-9418-2380	Wood E&IS
6	2019	Jun	27	15:45	11.99	2.181	1.145			05-1883-7419	17-3403-8072	Wood E&IS
7		Aug	2	0:00	9.077	-0.7291	-0.4405			03-9120-6967	06-1839-4155	Wood E&IS
8		Oct	8	15:30	10.29	0.4814	0.2732			17-9246-6483	01-1723-7825	Wood E&IS
9	2020	Jul	28	17:00	8.755	-1.051	-0.6461			09-5299-4651	16-9371-3551	Wood E&IS
10		Sep	12	18:15	6.938	-2.868	-1.972			02-4404-7341	15-1829-1450	Wood E&IS
11			29	14:50	9.876	0.06978	0.04042			05-6391-7157	09-8035-0927	Wood E&IS
12	2022	Jul	26	16:00	8.89	-0.9158	-0.559			05-0315-2040	03-8123-7745	Wood E&IS
13		Nov	2	16:20	8.766	-1.04	-0.639			06-5398-2454	19-7795-7920	WSP Laboratory
14	2023	Mar	29	0:00	12.86	3.053	1.545			11-1983-2594	18-5493-4487	WSP Laboratory
15		Aug	16	15:15	11.42	1.617	0.87			10-1256-9161	01-6470-5988	WSP Laboratory
16			30	14:15	10.25	0.4464	0.2538			08-9311-6369	09-6947-9254	WSP Laboratory
17		Sep	6	13:40	11.13	1.327	0.7234			03-7157-8414	11-4706-8760	WSP Laboratory
18			14	14:40	12.33	2.519	1.304			00-4405-6464	14-6380-0834	WSP Laboratory
19			20	15:15	9.637	-0.1695	-0.09941			05-7969-2966	06-0084-3779	WSP Laboratory
20		Oct	4	14:45	11.51	1.701	0.9122			16-4139-2506	04-0955-6599	WSP Laboratory
21		Nov	7	14:30	11.22	1.415	0.7687			02-7880-1353	20-8736-7798	WSP Laboratory

Water Quality for Bivalve Development

Client: Internal
Project ID: NH3 Reftox
Test No. 230816mgrdNH3

Test Species: *M. galloprovincialis*
Start Date/Time: 8/16/2023 1515
End Date/Time: 8/18/2023 1600

Test Conc. (mg/L NH3)	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
Lab Control (40.5) ^{me} (20-44)	Temp. (°C)	15.4	14.3	15.2
	Salinity (ppt)	31.6	31.9	32.1
	pH (units)	7.96	7.65	7.23
	DO (mg/L)	7.0	7.8	7.5
2 (40.5) 1.71	Temp. (°C)	15.2	14.1	15.3
	Salinity (ppt)	31.6	32.6	35.6
	pH (units)	7.93	7.63	7.69
	DO (mg/L)	7.4	8.1	7.9
4 (3.29)	Temp. (°C)	14.8	14.0	15.6
	Salinity (ppt)	31.6	33.0	35.2
	pH (units)	7.94	7.63	7.73
	DO (mg/L)	7.6	8.2	8.0
6 (5.49)	Temp. (°C)	14.9	13.8	15.5
	Salinity (ppt)	31.6	32.9	34.5
	pH (units)	7.94	7.63	7.74
	DO (mg/L)	7.5	8.1	7.8
8 (7.32)	Temp. (°C)	14.9	13.8	15.8
	Salinity (ppt)	31.5	32.6	34.3
	pH (units)	7.93	7.63	7.74
	DO (mg/L)	7.5	8.2	7.9
10 (8.42)	Temp. (°C)	14.8	13.9	16.0
	Salinity (ppt)	31.4	32.6	34.5
	pH (units)	7.94	7.64	7.73
	DO (mg/L)	7.4	8.3	8.1
20 (16.6)	Temp. (°C)	14.5	13.9	16.0
	Salinity (ppt)	31.1	33.2	35.4
	pH (units)	7.91	7.60	7.70
	DO (mg/L)	7.5	8.2	8.1
Tech Initials:		JF	KYB	HK

Source of Animals: NIWC/Mission Bay

Date Received: 8/29/23

Comments: Values in parentheses represent actual NH₃ concentrations

QC Check: M6

Final Review: MK 12/20/23

CETIS Test Data Worksheet

Report Date: 15 Aug-23 18:31 (p 1 of 1)

Test Code/ID: 230816mgrdNH3 / 10-1256-9161

Bivalve Larval Survival and Development Test

WSP Laboratory

Start Date: 16 Aug-23

1515
1600

Species: Mytilis galloprovincialis

Sample Code: 230816mgrdNH3

End Date: 18 Aug-23

Protocol: EPA/600/R-95/136 (1995)

Sample Source: Reference Toxicant

Sample Date: 16 Aug-23

Material: Total Ammonia

Sample Station:

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
0	LC	1	4					
0	LC	2	3					
0	LC	3	29					
0	LC	4	23					
0	LC	5	1					
2		1	5					
2		2	26					
2		3	8					
2		4	12					
2		5	25					
4		1	27					
4		2	30					
4		3	17					
4		4	21					
4		5	24					
6		1	13					
6		2	10					
6		3	16					
6		4	32					
6		5	18					
8		1	35					
8		2	28					
8		3	6					
8		4	34					
8		5	11					
10		1	15					
10		2	20					
10		3	7					
10		4	33					
10		5	14					
20		1	19					
20		2	22					
20		3	9					
20		4	2					
20		5	31					

QC: MB

CETIS Test Data Worksheet

Report Date: 15 Aug-23 18:32 (p 1 of 1)
 Test Code/ID: 230816mgrdNH3 / 10-1256-9161

Bivalve Larval Survival and Development Test

WSP Laboratory

Start Date: 16 Aug-23 ¹⁵¹⁵ Species: Mytilus galloprovincialis Sample Code: 230816mgrdNH3
 End Date: 18 Aug-23 ¹⁶⁰⁰ Protocol: EPA/600/R-95/136 (1995) Sample Source: Reference Toxicant
 Sample Date: 16 Aug-23 Material: Total Ammonia Sample Station:

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
			1			280	230	Ag 9/17/23
			2			251	4	
			3			266	222	
			4			299	251	
			5			285	226	
			6			277	224	
			7			298	215	
			8			271	210	
			9			254	1	
			10			310	241	
			11			278	208	
			12			306	239	
			13			253	187	
			14			270	214	
			15			297	227	
			16			264	202	
			17			288	228	
			18			289	234	
			19			288	8	
			20			258	205	
			21			263	209	
			22			297	1	
			23			254	207	
			24			272	226	
			25			287	227	
			26			311	251	
			27			295	237	
			28			288	229	
			29			269	225	
			30			291	222	
			31			269	5	
			32			286	233	
			33			292	228	
			34			263	213	
			35			262	201	

Ammonia Subsample Analysis - Overlying Water

Client: Internal

Test Species: *M. galloprovincialis*

Project ID: NH3 Reftox

Start Date: 8/15/2023

Test No.: 230815mordNH3

End Date: 8/17/2023

DI Blank: 0.0

10 mg/L Ammonia Stock:

(x1.22)

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check:

Final Review:

Mussel Reftox Unionized LC Redefined

[illegible]

Bivalve Reference Toxicant
48-hr Survival & Development
8/30/23

CETIS Summary Report

Report Date: 02 Apr-25 11:52 (p 1 of 2)
Test Code/ID: 230830mgrdNH3 / 08-9311-6369

Bivalve Larval Survival and Development Test

WSP Laboratory

Batch ID: 10-5476-7506	Test Type: Development-Survival	Analyst:
Start Date: 30 Aug-23 14:15	Protocol: EPA/600/R-95/136 (1995)	Diluent: Diluted Natural Seawater
Ending Date: 01 Sep-23 15:45	Species: Mytilis galloprovincialis	Brine: Not Applicable
Test Length: 50h	Taxon:	Source: Field Collected
		Age:
Sample ID: 06-0074-8857	Code: 230830mgrdNH3	Project:
Sample Date: 30 Aug-23	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 30 Aug-23	CAS (PC):	Station:
Sample Age: 14h	Client: Internal	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD
11-3767-3479	Combined Proportion Normal	Steel Many-One Rank Sum Test	7.48	17.37	11.4	10.2%
19-7309-0359	Proportion Normal	Steel Many-One Rank Sum Test	1.48	3.01	2.111	6.5%
17-3801-7320	Survival Rate	Dunnett Multiple Comparison Test	17.37	>17.37	—	12.1%

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL
09-7325-6212	Combined Proportion Normal	Trimmed Spearman-Kärber	EC50	10.25	10.07	10.43

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
19-7309-0359	Proportion Normal	Control Resp	0.912	0.9	>>	Yes	Passes Criteria
17-3801-7320	Survival Rate	Control Resp	0.9339	0.5	>>	Yes	Passes Criteria
11-3767-3479	Combined Proportion Normal	PMSD	0.1022	<<	0.25	No	Passes Criteria

Combined Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	0.8513	0.7591	0.9435	0.7402	0.9213	0.0332	0.0742	8.72%	0.00%
1.48		5	0.8000	0.7105	0.8895	0.6929	0.8898	0.0322	0.0721	9.01%	6.03%
3.01		5	0.7898	0.7157	0.8639	0.7323	0.8819	0.0267	0.0597	7.56%	7.23%
4.72		5	0.8028	0.7513	0.8542	0.7520	0.8485	0.0185	0.0414	5.16%	5.70%
6.33		5	0.7777	0.7311	0.8243	0.7323	0.8228	0.0168	0.0375	4.83%	8.65%
7.48		5	0.6959	0.5669	0.8250	0.5512	0.8392	0.0465	0.1040	14.94%	18.25%
17.37		5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	—	100.00%

Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	0.9120	0.8892	0.9348	0.8826	0.9286	0.0082	0.0184	2.02%	0.00%
1.48		5	0.8770	0.8328	0.9211	0.8148	0.8996	0.0159	0.0356	4.05%	3.84%
3.01		5	0.8597	0.8347	0.8848	0.8312	0.8819	0.0090	0.0201	2.34%	5.73%
4.72		5	0.8537	0.8244	0.8830	0.8304	0.8929	0.0106	0.0236	2.76%	6.40%
6.33		5	0.8494	0.7839	0.9150	0.7743	0.9087	0.0236	0.0528	6.21%	6.86%
7.48		5	0.7601	0.6246	0.8956	0.5957	0.8408	0.0488	0.1092	14.36%	16.66%
17.37		5	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	—	100.00%

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	0.9339	0.8296	1.0380	0.7992	1.0000	0.0375	0.0840	8.99%	0.00%
1.48		5	0.9110	0.8454	0.9767	0.8504	0.9921	0.0236	0.0529	5.80%	2.45%
3.01		5	0.9181	0.8485	0.9877	0.8622	1.0000	0.0251	0.0561	6.11%	1.69%
4.72		5	0.9409	0.8722	1.0100	0.8819	1.0000	0.0248	0.0554	5.89%	-0.76%
6.33		5	0.9173	0.8517	0.9829	0.8583	1.0000	0.0236	0.0528	5.76%	1.77%
7.48		5	0.9189	0.8093	1.0280	0.7913	1.0000	0.0395	0.0882	9.60%	1.60%
17.37		5	0.9417	0.9066	0.9769	0.9055	0.9803	0.0127	0.0283	3.01%	-0.84%

CETIS Summary Report

Report Date: 02 Apr-25 11:52 (p 2 of 2)
Test Code/ID: 230830mgrdNH3 / 08-9311-6369

Bivalve Larval Survival and Development Test

WSP Laboratory

Combined Proportion Normal Detail

MD5: 6B8C42E17F5E0D372A3BB92041B943DF

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	0.7402	0.8583	0.8228	0.9141	0.9213
1.48		0.8110	0.7795	0.8898	0.8268	0.6929
3.01		0.7638	0.8150	0.7559	0.7323	0.8819
4.72		0.8485	0.7520	0.8425	0.7835	0.7874
6.33		0.7743	0.7323	0.8228	0.8071	0.7520
7.48		0.6996	0.6654	0.7244	0.8392	0.5512
17.37		0.0000	0.0000	0.0000	0.0000	0.0000

Proportion Normal Detail

MD5: 8B3B34976FBF25B969318D50CE672417

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	0.9261	0.8826	0.9087	0.9141	0.9286
1.48		0.8996	0.8800	0.8968	0.8936	0.8148
3.01		0.8739	0.8625	0.8312	0.8493	0.8819
4.72		0.8485	0.8304	0.8425	0.8541	0.8929
6.33		0.7743	0.8194	0.9087	0.8686	0.8761
7.48		0.6996	0.8408	0.8251	0.8392	0.5957
17.37		0.0000	0.0000	0.0000	0.0000	0.0000

Survival Rate Detail

MD5: 0DF0B12CCDF1A83FA95DC962E8E55979

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	0.7992	0.9724	0.9055	1.0000	0.9921
1.48		0.9016	0.8858	0.9921	0.9252	0.8504
3.01		0.8740	0.9449	0.9094	0.8622	1.0000
4.72		1.0000	0.9055	1.0000	0.9173	0.8819
6.33		1.0000	0.8937	0.9055	0.9291	0.8583
7.48		1.0000	0.7913	0.8780	1.0000	0.9252
17.37		0.9055	0.9567	0.9370	0.9291	0.9803

CETIS Analytical Report

 Report Date: 02 Apr-25 11:52 (p 1 of 6)
 Test Code/ID: 230830mgrdNH3 / 08-9311-6369

Bivalve Larval Survival and Development Test										WSP Laboratory													
Analysis ID: 11-3767-3479			Endpoint: Combined Proportion Normal				CETIS Version: CETIS v2.1.5																
Analyzed: 02 Apr-25 11:50			Analysis: Nonparametric-Control vs Treatments				Status Level: 1																
Edit Date: 02 Apr-25 0:00			MD5 Hash: 6B8C42E17F5E0D372A3BB92041B943DF				Editor ID: 002-883-387-8																
Batch ID: 10-5476-7506			Test Type: Development-Survival				Analyst:																
Start Date: 30 Aug-23 14:15			Protocol: EPA/600/R-95/136 (1995)				Diluent: Diluted Natural Seawater																
Ending Date: 01 Sep-23 15:45			Species: Mytilis galloprovincialis				Brine: Not Applicable																
Test Length: 50h			Taxon:				Source: Field Collected			Age:													
Sample ID: 06-0074-8857			Code: 230830mgrdNH3				Project:																
Sample Date: 30 Aug-23			Material: Total Ammonia				Source: Reference Toxicant																
Receipt Date: 30 Aug-23			CAS (PC):				Station:																
Sample Age: 14h			Client: Internal																				
Data Transform		Alt Hyp			NOEL		LOEL		TOEL		Tox Units		MSDu		PMSD								
Angular (Corrected)		C > T			7.48		17.37		11.4		---		0.08704		10.22%								
Steel Many-One Rank Sum Test																							
Control		vs		Conc-mg/L		df		Test Stat		Critical		Ties		P-Type		P-Value		Decision(α:5%)					
Lab Control		1.48		8		22		16		0		CDF		0.3786		Non-Significant Effect							
		3.01		8		21		16		0		CDF		0.2891		Non-Significant Effect							
		4.72		8		22		16		0		CDF		0.3786		Non-Significant Effect							
		6.33		8		19.5		16		1		CDF		0.1778		Non-Significant Effect							
		7.48		8		17		16		0		CDF		0.0629		Non-Significant Effect							
		17.37*		8		15		16		0		CDF		0.0222		Significant Effect							
ANOVA Table																							
Source		Sum Squares				Mean Square				DF		F Stat		P-Value		Decision(α:5%)							
Between		4.95744				0.826241				6		134.1		<1.0E-05		Significant Effect							
Error		0.172475				0.0061598				28													
Total		5.12992								34													
ANOVA Assumptions Tests																							
Attribute		Test								Test Stat		Critical		P-Value		Decision(α:1%)							
Variance		Bartlett Equality of Variance Test								139.5		16.81		<1.0E-05		Unequal Variances							
Distribution		Shapiro-Wilk W Normality Test								0.9683		0.9146		0.3984		Normal Distribution							
Combined Proportion Normal Summary																							
Conc-mg/L		Code		Count		Mean		95% LCL		95% UCL		Median		Min		Max		Std Err		CV%		%Effect	
0		LC		5		0.8513		0.7591		0.9435		0.8583		0.7402		0.9213		0.0332		8.72%		0.00%	
1.48				5		0.8000		0.7105		0.8895		0.8110		0.6929		0.8898		0.0322		9.01%		6.03%	
3.01				5		0.7898		0.7157		0.8639		0.7638		0.7323		0.8819		0.0267		7.56%		7.23%	
4.72				5		0.8028		0.7513		0.8542		0.7874		0.7520		0.8485		0.0185		5.16%		5.70%	
6.33				5		0.7777		0.7311		0.8243		0.7743		0.7323		0.8228		0.0168		4.83%		8.65%	
7.48				5		0.6959		0.5669		0.8250		0.6996		0.5512		0.8392		0.0465		14.94%		18.25%	
17.37				5		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		---		100.00%	
Angular (Corrected) Transformed Summary																							
Conc-mg/L		Code		Count		Mean		95% LCL		95% UCL		Median		Min		Max		Std Err		CV%		%Effect	
0		LC		5		1.1830		1.0550		1.3120		1.1850		1.0360		1.2860		0.0462		8.73%		0.00%	
1.48				5		1.1120		0.9995		1.2250		1.1210		0.9835		1.2320		0.0405		8.15%		6.02%	
3.01				5		1.0980		1.0020		1.1940		1.0630		1.0270		1.2200		0.0345		7.03%		7.21%	
4.72				5		1.1120		1.0470		1.1770		1.0920		1.0490		1.1710		0.0235		4.72%		6.00%	
6.33				5		1.0810		1.0250		1.1370		1.0760		1.0270		1.1360		0.0203		4.20%		8.65%	
7.48				5		0.9915		0.8474		1.1360		0.9907		0.8367		1.1580		0.0519		11.70%		16.21%	
17.37				5		0.0314		0.0314		0.0314		0.0314		0.0314		0.0314		0.0000		0.00%		97.35%	

CETIS Analytical Report

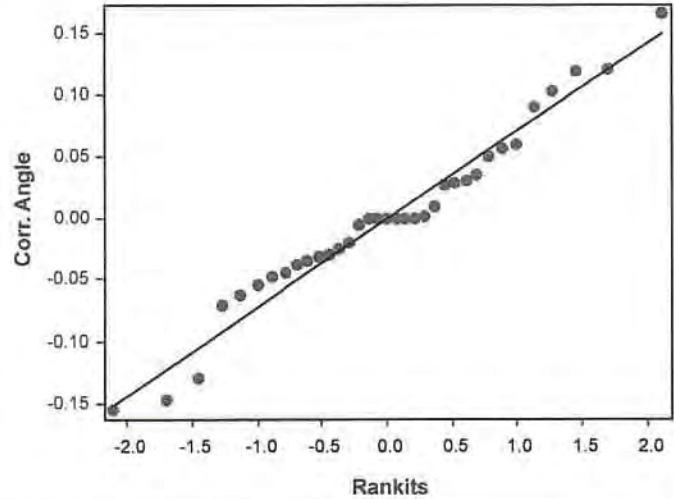
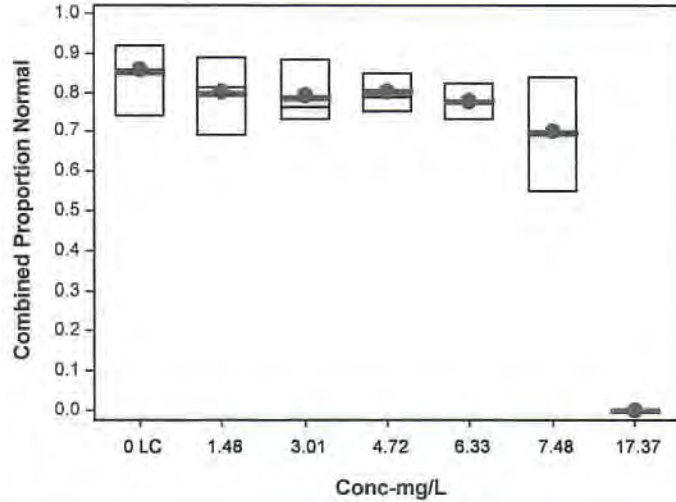
Report Date: 02 Apr-25 11:52 (p 2 of 6)
Test Code/ID: 230830mgrdNH3 / 08-9311-6369

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 11-3767-3479	Endpoint: Combined Proportion Normal	CETIS Version: CETIS v2.1.5
Analyzed: 02 Apr-25 11:50	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 02 Apr-25 0:00	MD5 Hash: 6B8C42E17F5E0D372A3BB92041B943DF	Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

Report Date: 02 Apr-25 11:52 (p 3 of 6)
Test Code/ID: 230830mgrdNH3 / 08-9311-6369

Bivalve Larval Survival and Development Test										WSP Laboratory	
Analysis ID: 19-7309-0359			Endpoint: Proportion Normal				CETIS Version: CETIS v2.1.5				
Analyzed: 02 Apr-25 11:50			Analysis: Nonparametric-Control vs Treatments				Status Level: 1				
Edit Date: 02 Apr-25 0:00			MD5 Hash: 8B3B34976FBF25B969318D50CE672417				Editor ID: 002-883-387-8				
Batch ID: 10-5476-7506			Test Type: Development-Survival				Analyst:				
Start Date: 30 Aug-23 14:15			Protocol: EPA/600/R-95/136 (1995)				Diluent: Diluted Natural Seawater				
Ending Date: 01 Sep-23 15:45			Species: Mytilis galloprovincialis				Brine: Not Applicable				
Test Length: 50h			Taxon:				Source: Field Collected		Age:		
Sample ID: 06-0074-8857			Code: 230830mgrdNH3				Project:				
Sample Date: 30 Aug-23			Material: Total Ammonia				Source: Reference Toxicant				
Receipt Date: 30 Aug-23			CAS (PC):				Station:				
Sample Age: 14h			Client: Internal								
Data Transform		Alt Hyp		NOEL		LOEL		TOEL		Tox Units MSDu PMSD	
Angular (Corrected)		C > T		1.48		3.01		2.111		--- 0.0593 6.50%	
Steel Many-One Rank Sum Test											
Control		vs		Conc-mg/L		df		Test Stat		Critical Ties P-Type P-Value Decision(α:5%)	
Lab Control		1.48		8 18		16		0		CDF 0.0987 Non-Significant Effect	
		3.01*		8 15		16		0		CDF 0.0222 Significant Effect	
		4.72*		8 16		16		0		CDF 0.0383 Significant Effect	
		6.33*		8 16.5		16		1		CDF 0.0493 Significant Effect	
		7.48*		8 15		16		0		CDF 0.0222 Significant Effect	
		17.37*		8 15		16		0		CDF 0.0222 Significant Effect	
ANOVA Table											
Source		Sum Squares		Mean Square		DF		F Stat		P-Value Decision(α:5%)	
Between		5.78165		0.963609		6		253.4		<1.0E-05 Significant Effect	
Error		0.106461		0.0038022		28					
Total		5.88811				34					
ANOVA Assumptions Tests											
Attribute		Test		Test Stat		Critical		P-Value		Decision(α:1%)	
Variance		Bartlett Equality of Variance Test		44.99		16.81		<1.0E-05		Unequal Variances	
Distribution		Shapiro-Wilk W Normality Test		0.9229		0.9146		0.0173		Normal Distribution	
Proportion Normal Summary											
Conc-mg/L		Code		Count		Mean		95% LCL 95% UCL		Median Min Max Std Err CV% %Effect	
0		LC		5		0.9120		0.8892 0.9348		0.9141 0.8826 0.9286 0.0082 2.02% 0.00%	
1.48				5		0.8770		0.8328 0.9211		0.8936 0.8148 0.8996 0.0159 4.05% 3.84%	
3.01				5		0.8597		0.8347 0.8848		0.8625 0.8312 0.8819 0.0090 2.34% 5.73%	
4.72				5		0.8537		0.8244 0.8830		0.8485 0.8304 0.8929 0.0106 2.76% 6.40%	
6.33				5		0.8494		0.7839 0.9150		0.8686 0.7743 0.9087 0.0236 6.21% 6.86%	
7.48				5		0.7601		0.6246 0.8956		0.8251 0.5957 0.8408 0.0488 14.36% 16.66%	
17.37				5		0.0000		0.0000 0.0000		0.0000 0.0000 0.0000 0.0000 — 100.00%	
Angular (Corrected) Transformed Summary											
Conc-mg/L		Code		Count		Mean		95% LCL 95% UCL		Median Min Max Std Err CV% %Effect	
0		LC		5		1.2710		1.2310 1.3100		1.2730 1.2210 1.3000 0.0142 2.49% 0.00%	
1.48				5		1.2150		1.1510 1.2780		1.2390 1.1260 1.2480 0.0228 4.20% 4.41%	
3.01				5		1.1880		1.1520 1.2230		1.1910 1.1470 1.2200 0.0129 2.43% 6.54%	
4.72				5		1.1790		1.1360 1.2220		1.1710 1.1460 1.2370 0.0155 2.94% 7.20%	
6.33				5		1.1770		1.0850 1.2680		1.2000 1.0760 1.2640 0.0328 6.23% 7.42%	
7.48				5		1.0660		0.9110 1.2210		1.1390 0.8817 1.1600 0.0559 11.71% 16.11%	
17.37				5		0.0323		0.0317 0.0330		0.0324 0.0317 0.0330 0.0002 1.50% 97.45%	

CETIS Analytical Report

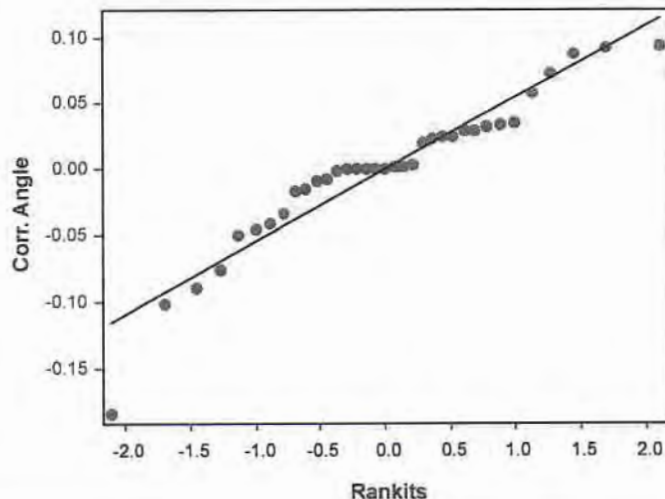
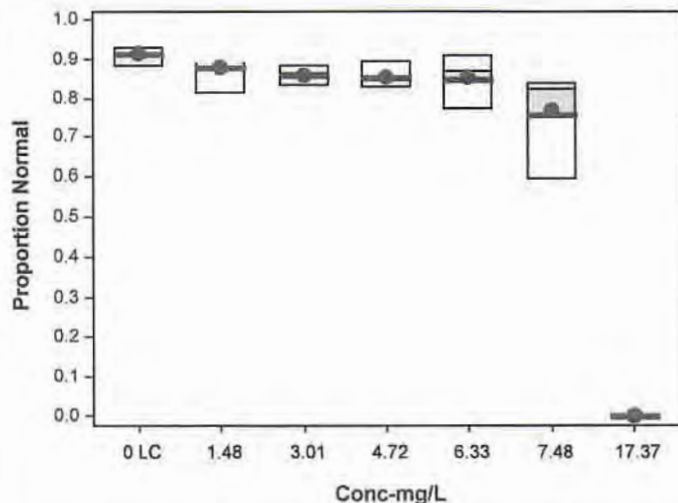
Report Date: 02 Apr-25 11:52 (p 4 of 6)
 Test Code/ID: 230830mgrdNH3 / 08-9311-6369

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 19-7309-0359 Endpoint: Proportion Normal CETIS Version: CETIS v2.1.5
 Analyzed: 02 Apr-25 11:50 Analysis: Nonparametric-Control vs Treatments Status Level: 1
 Edit Date: 02 Apr-25 0:00 MD5 Hash: 8B3B34976FBF25B969318D50CE672417 Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

Report Date: 02 Apr-25 11:52 (p 5 of 6)
Test Code/ID: 230830mgrdNH3 / 08-9311-6369

Bivalve Larval Survival and Development Test							WSP Laboratory				
Analysis ID: 17-3801-7320		Endpoint: Survival Rate			CETIS Version: CETIS v2.1.5						
Analyzed: 02 Apr-25 11:51		Analysis: Parametric-Control vs Treatments			Status Level: 1						
Edit Date: 02 Apr-25 0:00		MD5 Hash: 0DF0B12CCDF1A83FA95DC962E8E55979			Editor ID: 002-883-387-8						
Batch ID: 10-5476-7506		Test Type: Development-Survival			Analyst:						
Start Date: 30 Aug-23 14:15		Protocol: EPA/600/R-95/136 (1995)			Diluent: Diluted Natural Seawater						
Ending Date: 01 Sep-23 15:45		Species: Mytilis galloprovincialis			Brine: Not Applicable						
Test Length: 50h		Taxon:			Source: Field Collected		Age:				
Sample ID: 06-0074-8857		Code: 230830mgrdNH3			Project:						
Sample Date: 30 Aug-23		Material: Total Ammonia			Source: Reference Toxicant						
Receipt Date: 30 Aug-23		CAS (PC):			Station:						
Sample Age: 14h		Client: Internal									
Data Transform		Alt Hyp		NOEL		LOEL	TOEL	Tox Units	MSDu	PMSD	
Angular (Corrected)		C > T		17.37		>17.37	---	---	0.1134	12.14%	
Dunnett Multiple Comparison Test											
Control	vs	Conc-mg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)		
Lab Control		1.48	8	0.7772	2.407	0.2247	CDF	0.5558	Non-Significant Effect		
		3.01	8	0.5423	2.407	0.2247	CDF	0.6622	Non-Significant Effect		
		4.72	8	-0.09944	2.407	0.2247	CDF	0.8824	Non-Significant Effect		
		6.33	8	0.5727	2.407	0.2247	CDF	0.6488	Non-Significant Effect		
		7.48	8	0.2292	2.407	0.2247	CDF	0.7860	Non-Significant Effect		
		17.37	8	0.2612	2.407	0.2247	CDF	0.7746	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.0266646		0.0044441		6	0.204	0.9727	Non-Significant Effect			
Error	0.609922		0.0217829		28						
Total	0.636587				34						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Bartlett Equality of Variance Test				4.451	16.81	0.6159	Equal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.9341	0.9146	0.0371	Normal Distribution			
Survival Rate Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	0.9339	0.8296	1.0000	0.9724	0.7992	1.0000	0.0375	8.99%	0.00%
1.48		5	0.9110	0.8454	0.9767	0.9016	0.8504	0.9921	0.0236	5.80%	2.45%
3.01		5	0.9181	0.8485	0.9877	0.9094	0.8622	1.0000	0.0251	6.11%	1.69%
4.72		5	0.9409	0.8722	1.0000	0.9173	0.8819	1.0000	0.0248	5.89%	-0.76%
6.33		5	0.9173	0.8517	0.9829	0.9055	0.8583	1.0000	0.0236	5.76%	1.77%
7.48		5	0.9189	0.8093	1.0000	0.9252	0.7913	1.0000	0.0395	9.60%	1.60%
17.37		5	0.9417	0.9066	0.9769	0.9370	0.9055	0.9803	0.0127	3.01%	-0.84%
Angular (Corrected) Transformed Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	1.3580	1.1400	1.5760	1.4040	1.1060	1.5390	0.0787	12.95%	0.00%
1.48		5	1.2850	1.1390	1.4320	1.2520	1.1740	1.4820	0.0528	9.19%	5.34%
3.01		5	1.3070	1.1320	1.4830	1.2650	1.1900	1.5390	0.0632	10.81%	3.73%
4.72		5	1.3670	1.1700	1.5640	1.2790	1.2200	1.5390	0.0709	11.60%	-0.68%
6.33		5	1.3050	1.1330	1.4760	1.2580	1.1850	1.5390	0.0616	10.57%	3.94%
7.48		5	1.3370	1.0910	1.5820	1.2940	1.0960	1.5390	0.0886	14.82%	1.58%
17.37		5	1.3340	1.2530	1.4150	1.3170	1.2580	1.4300	0.0292	4.89%	1.80%

CETIS Analytical Report

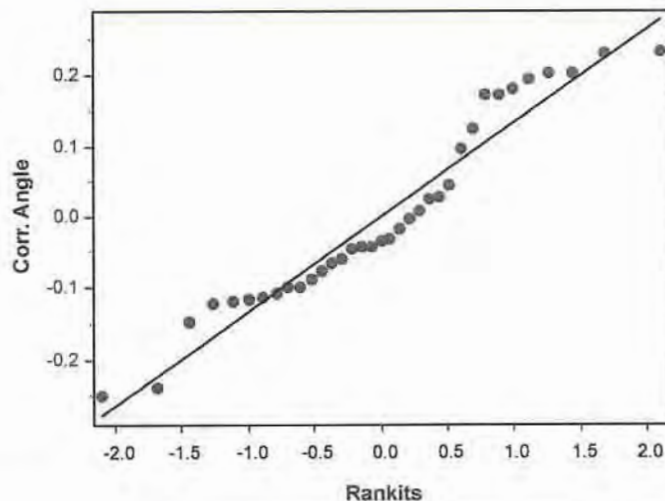
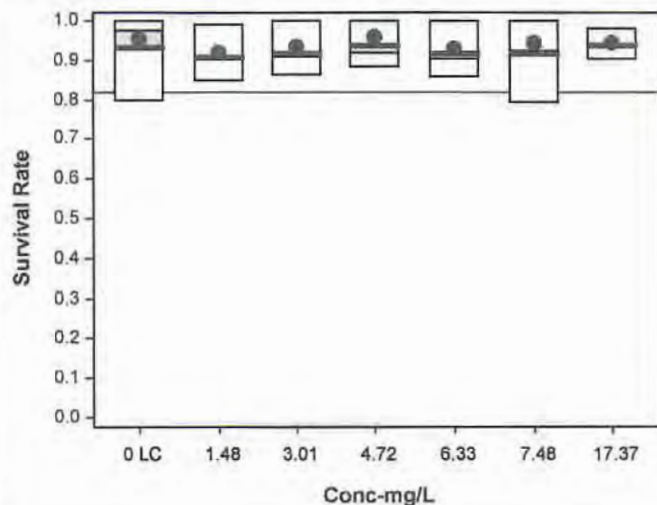
Report Date: 02 Apr-25 11:52 (p 6 of 6)
Test Code/ID: 230830mgrdNH3 / 08-9311-6369

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 17-3801-7320	Endpoint: Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 02 Apr-25 11:51	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 02 Apr-25 0:00	MD5 Hash: 0DF0B12CCDF1A83FA95DC962E8E55979	Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

Report Date: 02 Apr-25 11:52 (p 1 of 1)
Test Code/ID: 230830mgrdNH3 / 08-9311-6369

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 09-7325-6212 Endpoint: Combined Proportion Normal CETIS Version: CETIS v2.1.5
Analyzed: 02 Apr-25 11:51 Analysis: Trimmed Spearman-Kärber Status Level: 1
Edit Date: 02 Apr-25 0:00 MD5 Hash: 6B8C42E17F5E0D372A3BB92041B943DF Editor ID: 002-883-387-8

Batch ID: 10-5476-7506 Test Type: Development-Survival Analyst:
Start Date: 30 Aug-23 14:15 Protocol: EPA/600/R-95/136 (1995) Diluent: Diluted Natural Seawater
Ending Date: 01 Sep-23 15:45 Species: Mytilis galloprovincialis Brine: Not Applicable
Test Length: 50h Taxon: Source: Field Collected Age:

Sample ID: 06-0074-8857 Code: 230830mgrdNH3 Project:
Sample Date: 30 Aug-23 Material: Total Ammonia Source: Reference Toxicant
Receipt Date: 30 Aug-23 CAS (PC): Station:
Sample Age: 14h Client: Internal

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.1486	6.04%	1.011	0.003815	10.25	10.07	10.43

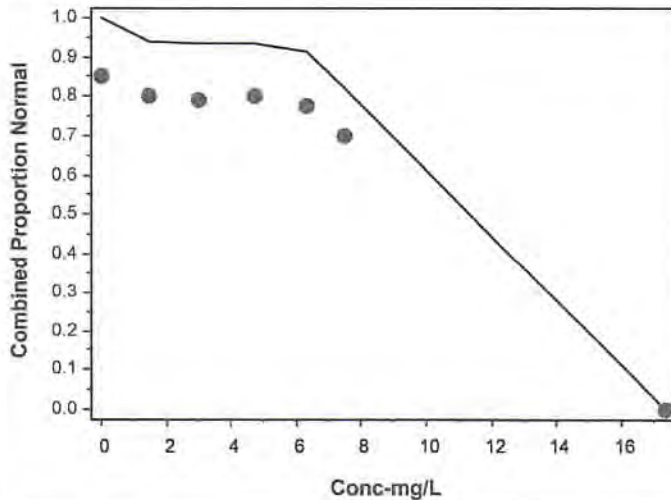
Combined Proportion Normal Summary

Calculated Variate(A/B)

Isotonic Variate

Conc-mg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	$\Sigma A/\Sigma B$	Mean	%Effect
0	LC	5	0.8513	0.8583	0.7402	0.9213	8.72%	0.00%	1083/1272	0.8513	0.00%
1.48		5	0.8000	0.8110	0.6929	0.8898	9.01%	6.03%	1016/1270	0.8000	6.03%
3.01		5	0.7898	0.7638	0.7323	0.8819	7.56%	7.23%	1003/1270	0.7963	6.47%
4.72		5	0.8028	0.7874	0.7520	0.8485	5.16%	5.70%	1028/1280	0.7963	6.47%
6.33		5	0.7777	0.7743	0.7323	0.8228	4.83%	8.65%	990/1273	0.7777	8.65%
7.48		5	0.6959	0.6996	0.5512	0.8392	14.94%	18.25%	917/1311	0.6959	18.25%
17.37		5	0.0000	0.0000	0.0000	0.0000	—	100.00%	0/1270	0.0000	100.00%

Graphics



Bivalve Larval Survival and Development Test

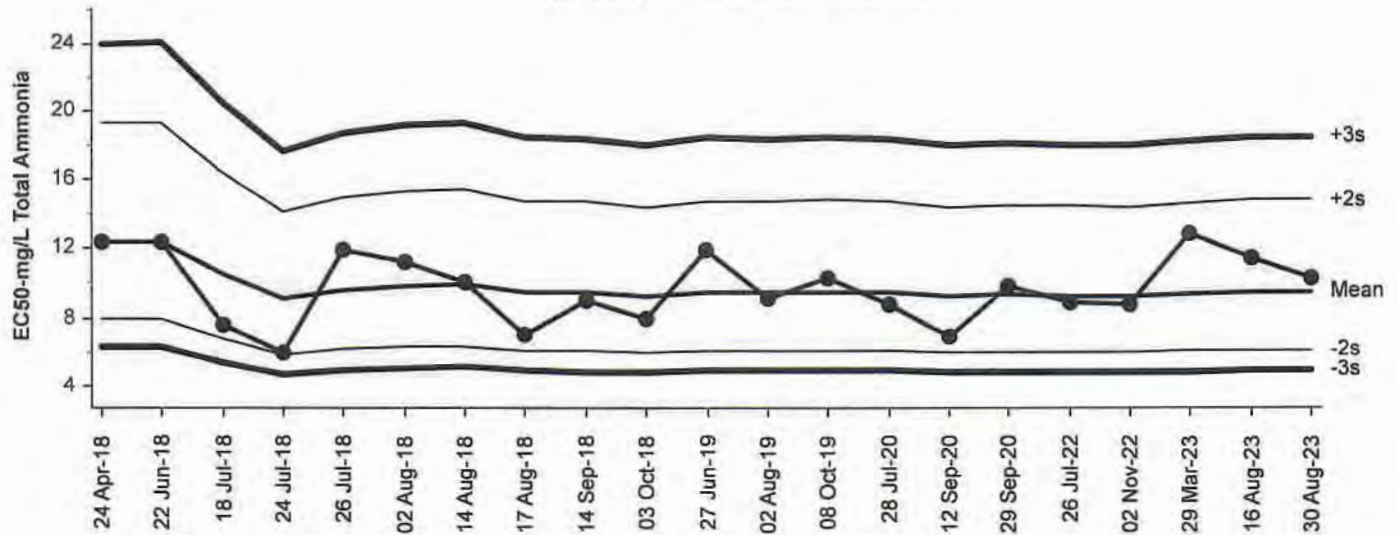
All Matching Labs

Test Type: Development-Survival
Protocol: EPA/600/R-95/136 (1995)

Organism: *Mytilus galloprovincialis*
Endpoint: Combined Proportion Normal

Material: Total Ammonia
Source: Reference Toxicant-REF

Bivalve Larval Survival and Development Test
Combined Proportion Normal Endpoint



Lognormal Cumulative Mean Plot

Mean: 9.497 Count: 20 -2s Warning Limit: 6.09 -3s Action Limit: 4.88
Sigma: NA CV: 22.50% +2s Warning Limit: 14.8 +3s Action Limit: 18.5

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2018	Apr	24	13:50	12.35	2.857	1.185			07-6862-1383	14-0887-3900	Wood E&IS
2		Jun	22	18:15	12.41	2.917	1.207			14-3626-7506	07-2831-7429	Wood E&IS
3		Jul	18	13:10	7.574	-1.923	-1.019			14-1933-2999	09-8220-2485	Wood E&IS
4			24	0:00	5.919	-3.578	-2.13	(-)		06-2214-9289	19-4459-2946	Aquatic Bioassay & Consu
5			26	15:30	11.91	2.417	1.021			04-4750-3360	07-2492-6358	Wood E&IS
6		Aug	2	14:15	11.26	1.766	0.7682			15-4398-7435	08-1276-4615	Wood E&IS
7			14	14:15	10.09	0.59	0.2715			06-7156-7887	14-6273-7305	Wood E&IS
8			17	17:15	6.994	-2.504	-1.378			03-5411-9632	11-7669-9942	Wood E&IS
9		Sep	14	15:00	9.017	-0.4802	-0.2337			17-8327-4430	05-1718-6773	Wood E&IS
10		Oct	3	15:20	7.902	-1.595	-0.8282			17-8768-6287	19-9418-2380	Wood E&IS
11	2019	Jun	27	15:45	11.99	2.49	1.049			05-1883-7419	17-3403-8072	Wood E&IS
12		Aug	2	0:00	9.077	-0.4203	-0.2039			03-9120-6967	06-1839-4155	Wood E&IS
13		Oct	8	15:30	10.29	0.7902	0.36			17-9246-6483	01-1723-7825	Wood E&IS
14	2020	Jul	28	17:00	8.755	-0.7417	-0.3663			09-5299-4651	16-9371-3551	Wood E&IS
15		Sep	12	18:15	6.938	-2.559	-1.414			02-4404-7341	15-1829-1450	Wood E&IS
16			29	14:50	9.876	0.3786	0.1761			05-6391-7157	09-8035-0927	Wood E&IS
17	2022	Jul	26	16:00	8.89	-0.607	-0.2975			05-0315-2040	03-8123-7745	Wood E&IS
18		Nov	2	16:20	8.766	-0.7309	-0.3607			06-5398-2454	19-7795-7920	WSP Laboratory
19	2023	Mar	29	0:00	12.86	3.361	1.365			11-1983-2594	18-5493-4487	WSP Laboratory
20		Aug	16	15:15	11.42	1.925	0.8315			10-1256-9161	01-6470-5988	WSP Laboratory
21			30	14:15	10.25	0.7552	0.3447			08-9311-6369	09-6947-9254	WSP Laboratory

CETIS Test Data Worksheet

Report Date: 28 Aug-23 10:17 (p 1 of 1)

Test Code/ID: 230830mgrdNH3 / 08-9311-6369

Bivalve Larval Survival and Development Test

WSP Laboratory

Start Date: 30 Aug-23 ⁴¹⁵
 End Date: 01 Sep-23 ⁵⁴⁵
 Sample Date: 30 Aug-23

Species: Mytilis galloprovincialis
 Protocol: EPA/600/R-95/136 (1995)
 Material: Total Ammonia

Sample Code: 230830mgrdNH3
 Sample Source: Reference Toxicant
 Sample Station:

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted JF	# Normal JF	Notes
			1			252 227	200 231	
			2			236	0	
			3			241 JF	216 218 JF	
			4			203	188	
			5			229	206	
			6			230	209	
			7			223	184	
			8			252	226	
			9			238	0	
			10			230	191	
			11			218	191	
			12			235	210	
			13			264	224	
			14			235	140	
			15			263	184	
			16			254	214	
			17			231	192	
			18			224	260	
			19			230	0	
			20			201	169	
			21			219	186	
			22			243	0	
			23			256	234	
			24			254	224	
			25			216	176	
			26			225	198	
			27			222	194	
			28			227	186	
			29			230	209	
			30			240	207	
			31			249	0	
			32			233	199	
			33			286	240	
			34			236	205	
			35			257	199	

Water Quality for Bivalve Development

Client: Internal
Project ID: NH3 Reftox
Test No. 230830mgrdNH3

Test Species: *M. galloprovincialis*
Start Date/Time: 8/30/2023 1415
End Date/Time: 9/1/2023 1545

Test Conc. (Sample ID ^{TL})	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
mg/L NH ₃ LC (41.22)	Temp. (°C)	15.8	14.1	14.3
	Salinity (ppt)	31.6	31.9	31.8
	pH (units)	7.84	7.55	7.51
	DO (mg/L)	7.5	8.0	7.9
2 (1.48)	Temp. (°C)	16.0	14.0	14.1
	Salinity (ppt)	31.2	31.9	32.8
	pH (units)	7.76	7.54	7.62
	DO (mg/L)	7.6	8.1	8.0
4 (3.01)	Temp. (°C)	16.0	14.0	14.0
	Salinity (ppt)	31.3	31.9	33.1
	pH (units)	7.76	7.55	7.63
	DO (mg/L)	7.7	8.1	8.3
6 (4.72)	Temp. (°C)	16.0	14.05 KYB (B)	14.0 (B)
	Salinity (ppt)	31.2	31.9	32.5
	pH (units)	7.76	7.56	7.65 KYB 7.73
	DO (mg/L)	7.7	7.9	7.5
8 (6.33)	Temp. (°C)	16.0	14.0	14.1
	Salinity (ppt)	31.1	32.2	33.2
	pH (units)	7.75	7.54	7.64
	DO (mg/L)	7.7	8.2	8.3
10 (7.48)	Temp. (°C)	(A)	(A)	(A)
	Salinity (ppt)			
	pH (units)			
	DO (mg/L)			
20 (17.37)	Temp. (°C)	15.9	14.0	14.1
	Salinity (ppt)	31.0	32.0	32.8
	pH (units)	7.72	7.53	7.62
	DO (mg/L)	7.7	8.3	8.2
Tech Initials:		JF	KYB	KYB

Source of Animals: NIWL/Mission Bay

Date Received: 8/29/23

Comments: (A) Spilled concentration, not enough volume for WQ readings
(B) Limited volume in cup

QC Check: Ab 12/6/23

Final Review: JF 12/20/23

Embryo-Larval Development Test

Stock Preparation Worksheet

Test Species: M. galloprovincialis
 Batch ID: 23-08-061 to 23-08-068
 Test Type: Sediment-Water Interface

Test Date: 8/30/2023
 Analyst: AG

Task	
Spawning Induction	0945
Spawning Begins	8:1015 / 9:1030
# Males/# Females	7/5
Spawn Condition	good
Fertilization Initiated	1130
Fertilization End/Eggs Rinsed	1150/1210
Embryo Counts	1310
Test Initiation	1415

Embryo Density Counts

per 100 μ L

Stock #	Stock Volume (mL)	Rep 1	Rep 2	Rep 3	Rep 4	Mean #/100 μ L	Mean #/mL
Stock 1	250	45	40	45	43	43.25	43.25
Stock 2-1.1	250	20	20	35	32	26.75	26.75
Stock 3-5	250	29	38	31	35	30.75	30.75
Stock 510	250	28	21	23	15	21.75	21.75

Cell Division:

	% Divided
Stock 1	89.2
Stock 2-1.1	86.0
Stock 3-5	97.8
510	90.6
Selected Stock:	5

$T_{01}: 258$
 $T_{02}: 260$
 $T_{03}: 237$
 $T_{04}: 281$
 $T_{05}: 237$
 $x = 254$

Stock Density

$\frac{1,537.5}{500} = 3.075$

Dil Factor

$\frac{3.075}{3.325} = 0.925$

Adjust selected embryo stock to 500 embryos/mL.

Dilution Factor = Stock Density/mL/500

In 10 mL sample volume add 500 μ L of 500 embryo/mL stock to obtain 25 embryos/mL in test vials.

Notes:

$QC_1 = \frac{2420}{212/230}$

QA Review:

AG 12/18/23

Final Review: JF 12/20/23

CETIS Test Data Worksheet

Report Date: 28 Aug-23 10:17 (p 1 of 1)
 Test Code/ID: 230830mgrdNH3 / 08-9311-6369

Bivalve Larval Survival and Development Test

WSP Laboratory

Start Date: 30 Aug-23 1415 Species: Mytilis galloprovincialis
 End Date: 01 Sep-23 1545 Protocol: EPA/600/R-95/136 (1995)
 Sample Date: 30 Aug-23 Material: Total Ammonia

Sample Code: 230830mgrdNH3
 Sample Source: Reference Toxicant
 Sample Station:

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
0	LC	1	4					
0	LC	2	3					
0	LC	3	29					
0	LC	4	23					
0	LC	5	1					
2		1	5					
2		2	26					
2		3	8					
2		4	12					
2		5	25					
4		1	27					
4		2	30					
4		3	17					
4		4	21					
4		5	24					
6		1	13					
6		2	10					
6		3	16					
6		4	32					
6		5	18					
8		1	35					
8		2	28					
8		3	6					
8		4	34					
8		5	11					
10		1	15					
10		2	20					
10		3	7					
10		4	33					
10		5	14					
20		1	19					
20		2	22					
20		3	9					
20		4	2					
20		5	31					

QC: HK
 QC: Day 0 TF

Ammonia Subsample Analysis - Overlying Water

Client: WSP
 Project ID: NH3 Reference Toxicant
 Test No.: 230830mgrdNH3

Test Species: M.galloprovincialis
 Start Date: 8/30/2023 1415
 End Date: 9/1/2023 1545

DI Blank: 0.0

10 mg/L Ammonia Stock: 9.6
 (x1.22)

Sample ID	Test Day	Vial #	Ammonia (mg/L as N)	Ammonia (mg/L as NH ₃)	Notes
LC	0	37	<1.0	<1.22	10/19/23
2	0	38	1.21	1.48	
4	0	39	2.47	3.01	
6	0	40	3.87	4.72	
8	0	41	5.19	6.33	
10	0	42	6.13	7.48	
20	0	43	14.21 1.0 MK	17.37	
LC	2	44	<1.0	<1.22	
2	2	45	1.53	1.87	
4	2	46	2.83	3.45	
6	2	47	3.76	4.59	
8	2	48	5.15	6.28	
10	2	49	6.50	7.93	
20	2	50	14.08	17.18	

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check:

Final Review:

Mussel Reftox Unionized LC Redefined

Unionized Ammonia Calculation for Pressure of 1 atm																		
Input 'Shaded' data																		

Bivalve Reference Toxicant
48-hr Survival & Development
9/06/23

CETIS Summary Report

Report Date: 14 Dec-23 15:35 (p 1 of 3)
Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test

WSP Laboratory

Batch ID: 09-8554-2153	Test Type: Development-Survival	Analyst:	
Start Date: 06 Sep-23 13:40	Protocol: EPA/600/R-95/136 (1995)	Diluent: Diluted Natural Seawater	
Ending Date: 08 Sep-23 14:30	Species: Mytilus galloprovincialis	Brine: Not Applicable	
Test Length: 49h	Taxon:	Source: Field Collected	Age:
Sample ID: 09-1540-7899	Code: 230906mgrdNH3	Project:	
Sample Date: 06 Sep-23	Material: Total Ammonia	Source: Reference Toxicant	
Receipt Date: 06 Sep-23	CAS (PC):	Station:	
Sample Age: 14h	Client: Internal		

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD
17-3041-2225	Combined Proportion Normal	Dunnett Multiple Comparison Test	7.43	17.93	11.54	4.54%
10-1023-8814	Proportion Normal	Dunnett Multiple Comparison Test	7.43	17.93	11.54	3.87%
15-8927-6619	Survival Rate	Steel Many-One Rank Sum Test	7.43	17.93	11.54	2.03%

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL
00-6820-9635	Combined Proportion Normal	Trimmed Spearman-Kärber	EC50	11.13	11.04	11.23

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
10-1023-8814	Proportion Normal	Control Resp	0.9217	0.9	>>	Yes	Passes Criteria
15-8927-6619	Survival Rate	Control Resp	1	0.5	>>	Yes	Passes Criteria
17-3041-2225	Combined Proportion Normal	PMSD	0.04542	<<	0.25	No	Passes Criteria

Combined Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	0.9217	0.8976	0.9458	0.8876	0.9343	0.0087	0.0194	2.11%	0.00%
1.54		5	0.9234	0.8945	0.9523	0.8835	0.9438	0.0104	0.0233	2.52%	-0.19%
3.07		5	0.9019	0.8492	0.9545	0.8571	0.9492	0.0190	0.0424	4.70%	2.15%
4.33		5	0.9140	0.8794	0.9487	0.8684	0.9366	0.0125	0.0279	3.06%	0.83%
5.88		5	0.8715	0.8401	0.9030	0.8344	0.8985	0.0113	0.0253	2.91%	5.44%
7.43		5	0.8882	0.8607	0.9156	0.8534	0.9060	0.0099	0.0221	2.49%	3.64%
17.93		5	0.0083	-0.0034	0.0199	0.0000	0.0226	0.0042	0.0094	113.18%	99.10%

Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	0.9217	0.8976	0.9458	0.8876	0.9343	0.0087	0.0194	2.11%	0.00%
1.54		5	0.9275	0.9092	0.9458	0.9038	0.9438	0.0066	0.0147	1.59%	-0.63%
3.07		5	0.9309	0.9116	0.9502	0.9120	0.9492	0.0070	0.0155	1.67%	-1.00%
4.33		5	0.9315	0.9060	0.9570	0.9023	0.9504	0.0092	0.0205	2.20%	-1.07%
5.88		5	0.8778	0.8337	0.9220	0.8344	0.9300	0.0159	0.0356	4.05%	4.76%
7.43		5	0.9025	0.8767	0.9282	0.8764	0.9341	0.0093	0.0207	2.30%	2.09%
17.93		5	0.0085	-0.0033	0.0202	0.0000	0.0227	0.0042	0.0095	111.58%	99.08%

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
1.54		5	0.9955	0.9830	1.0080	0.9774	1.0000	0.0045	0.0101	1.01%	0.45%
3.07		5	0.9684	0.9308	1.0060	0.9323	1.0000	0.0135	0.0303	3.12%	3.16%
4.33		5	0.9812	0.9565	1.0060	0.9586	1.0000	0.0089	0.0199	2.03%	1.88%
5.88		5	0.9932	0.9744	1.0120	0.9662	1.0000	0.0068	0.0151	1.52%	0.68%
7.43		5	0.9842	0.9660	1.0020	0.9699	1.0000	0.0066	0.0147	1.49%	1.58%
17.93		5	0.9647	0.9275	1.0020	0.9248	0.9962	0.0134	0.0299	3.10%	3.53%

CETIS Summary Report

Report Date: 14 Dec-23 15:35 (p 2 of 3)
 Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test

WSP Laboratory

Combined Proportion Normal Detail

MD5: ADE60CC2DFF65F31667053731BE58218

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	0.9343	0.9300	0.8876	0.9239	0.9326
1.54		0.9296	0.9438	0.9267	0.8835	0.9336
3.07		0.8571	0.9286	0.8571	0.9492	0.9173
4.33		0.9194	0.9098	0.8684	0.9361	0.9366
5.88		0.8915	0.8693	0.8344	0.8640	0.8985
7.43		0.9046	0.8972	0.8797	0.8534	0.9060
17.93		0.0000	0.0075	0.0000	0.0226	0.0113

Proportion Normal Detail

MD5: B59396525CE5F46555D6662E5459016C

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	0.9343	0.9300	0.8876	0.9239	0.9326
1.54		0.9296	0.9438	0.9267	0.9038	0.9336
3.07		0.9194	0.9427	0.9120	0.9492	0.9313
4.33		0.9194	0.9490	0.9023	0.9504	0.9366
5.88		0.8915	0.8693	0.8344	0.8640	0.9300
7.43		0.9046	0.8972	0.9000	0.8764	0.9341
17.93		0.0000	0.0078	0.0000	0.0227	0.0119

Survival Rate Detail

MD5: 19AA65BBF501CA3033138C1F241D99FF

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	1.0000	1.0000	1.0000	1.0000	1.0000
1.54		1.0000	1.0000	1.0000	0.9774	1.0000
3.07		0.9323	0.9850	0.9398	1.0000	0.9850
4.33		1.0000	0.9586	0.9624	0.9850	1.0000
5.88		1.0000	1.0000	1.0000	1.0000	0.9662
7.43		1.0000	1.0000	0.9774	0.9737	0.9699
17.93		0.9962	0.9586	0.9248	0.9925	0.9511

CETIS Summary Report

Report Date: 14 Dec-23 15:35 (p 3 of 3)
 Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test

WSP Laboratory

Combined Proportion Normal Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	256/274	279/300	237/267	255/276	249/267
1.54		264/284	252/267	253/273	235/266	267/286
3.07		228/266	247/266	228/266	299/315	244/266
4.33		285/310	242/266	231/266	249/266	251/268
5.88		263/295	246/283	267/320	286/331	239/266
7.43		256/283	253/282	234/266	227/266	241/266
17.93		0/266	2/266	0/266	6/266	3/266

Proportion Normal Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	256/274	279/300	237/267	255/276	249/267
1.54		264/284	252/267	253/273	235/260	267/286
3.07		228/248	247/262	228/250	299/315	244/262
4.33		285/310	242/255	231/256	249/262	251/268
5.88		263/295	246/283	267/320	286/331	239/257
7.43		256/283	253/282	234/260	227/259	241/258
17.93		0/265	2/255	0/246	6/264	3/253

Survival Rate Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	266/266	266/266	266/266	266/266	266/266
1.54		266/266	266/266	266/266	260/266	266/266
3.07		248/266	262/266	250/266	266/266	262/266
4.33		266/266	255/266	256/266	262/266	266/266
5.88		266/266	266/266	266/266	266/266	257/266
7.43		266/266	266/266	260/266	259/266	258/266
17.93		265/266	255/266	246/266	264/266	253/266

CETIS Analytical Report

Report Date: 14 Dec-23 15:35 (p 1 of 6)
 Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 17-3041-2225 Endpoint: Combined Proportion Normal CETIS Version: CETIS v2.1.5
 Analyzed: 14 Dec-23 15:34 Analysis: Parametric-Control vs Treatments Status Level: 1
 Edit Date: 11 Dec-23 10:08 MD5 Hash: ADE60CC2DFF65F31667053731BE58218 Editor ID: 002-883-387-8

Batch ID: 09-8554-2153 Test Type: Development-Survival Analyst:
 Start Date: 06 Sep-23 13:40 Protocol: EPA/600/R-95/136 (1995) Diluent: Diluted Natural Seawater
 Ending Date: 08 Sep-23 14:30 Species: Mytilis galloprovincialis Brine: Not Applicable
 Test Length: 49h Taxon: Source: Field Collected Age:

Sample ID: 09-1540-7899 Code: 230906mgrdNH3 Project:
 Sample Date: 06 Sep-23 Material: Total Ammonia Source: Reference Toxicant
 Receipt Date: 06 Sep-23 CAS (PC): Station:
 Sample Age: 14h Client: Internal

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	7.43	17.93	11.54	---	0.04187	4.54%

Dunnett Multiple Comparison Test

Control	vs	Conc-mg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Lab Control		1.54	8	-0.133	2.407	0.07183	CDF	0.8901	Non-Significant Effect
		3.07	8	1.031	2.407	0.07183	CDF	0.4379	Non-Significant Effect
		4.33	8	0.4257	2.407	0.07183	CDF	0.7113	Non-Significant Effect
		5.88*	8	2.786	2.407	0.07183	CDF	0.0221	Significant Effect
		7.43	8	1.932	2.407	0.07183	CDF	0.1236	Non-Significant Effect
		17.93*	8	40.47	2.407	0.07183	CDF	<1.0E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.97193	0.995322	6	447.1	<1.0E-05	Significant Effect
Error	0.0623274	0.002226	28			
Total	6.03426		34			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	3.504	16.81	0.7434	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9292	0.9146	0.0264	Normal Distribution

Combined Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	0.9217	0.8976	0.9458	0.9300	0.8876	0.9343	0.0087	2.11%	0.00%
1.54		5	0.9234	0.8945	0.9523	0.9296	0.8835	0.9438	0.0104	2.52%	-0.19%
3.07		5	0.9019	0.8492	0.9545	0.9173	0.8571	0.9492	0.0190	4.70%	2.15%
4.33		5	0.9140	0.8794	0.9487	0.9194	0.8684	0.9366	0.0125	3.06%	0.83%
5.88		5	0.8715	0.8401	0.9030	0.8693	0.8344	0.8985	0.0113	2.91%	5.44%
7.43		5	0.8882	0.8607	0.9156	0.8972	0.8534	0.9060	0.0099	2.49%	3.64%
17.93		5	0.0083	0.0000	0.0199	0.0075	0.0000	0.0226	0.0042	113.18%	99.10%

Angular (Corrected) Transformed Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	1.2890	1.2460	1.3310	1.3030	1.2290	1.3120	0.0153	2.65%	0.00%
1.54		5	1.2930	1.2410	1.3440	1.3020	1.2220	1.3310	0.0185	3.20%	-0.31%
3.07		5	1.2580	1.1680	1.3470	1.2790	1.1830	1.3430	0.0322	5.72%	2.39%
4.33		5	1.2760	1.2170	1.3350	1.2830	1.2000	1.3160	0.0214	3.75%	0.99%
5.88		5	1.2050	1.1590	1.2520	1.2010	1.1520	1.2470	0.0168	3.11%	6.45%
7.43		5	1.2310	1.1890	1.2730	1.2440	1.1780	1.2590	0.0153	2.78%	4.47%
17.93		5	0.0811	0.0171	0.1450	0.0868	0.0307	0.1508	0.0230	63.55%	93.71%

CETIS Analytical Report

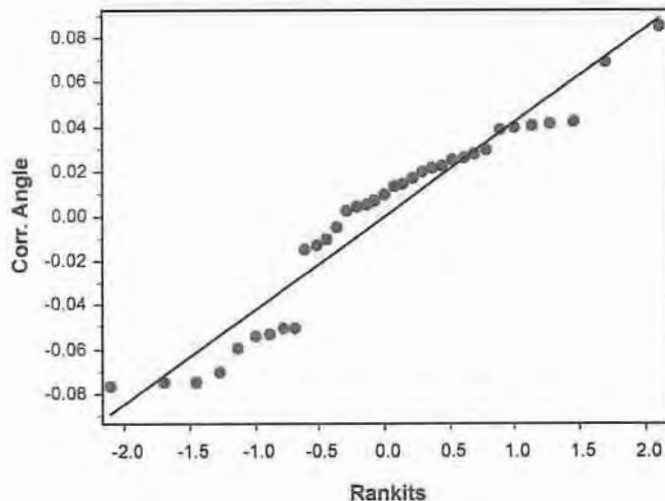
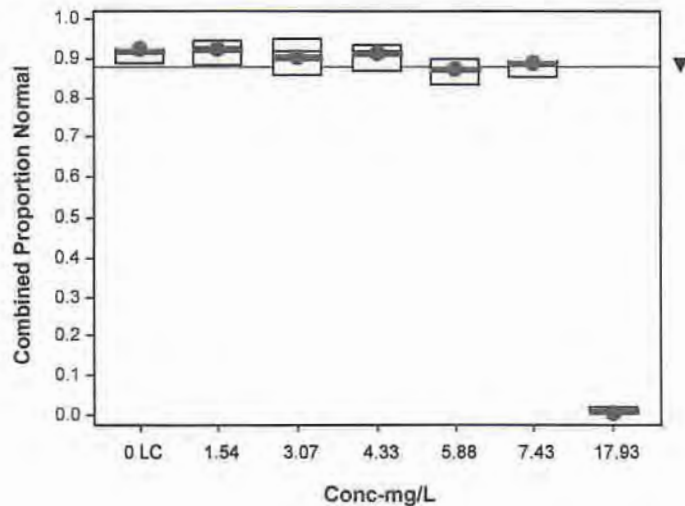
Report Date: 14 Dec-23 15:35 (p 2 of 6)
Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 17-3041-2225	Endpoint: Combined Proportion Normal	CETIS Version: CETIS v2.1.5
Analyzed: 14 Dec-23 15:34	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 11 Dec-23 10:08	MD5 Hash: ADE60CC2DFF65F31667053731BE58218	Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

Report Date: 14 Dec-23 15:35 (p 3 of 6)
Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 10-1023-8814	Endpoint: Proportion Normal	CETIS Version: CETIS v2.1.5
Analyzed: 14 Dec-23 15:34	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 11 Dec-23 10:08	MD5 Hash: B59396525CE5F46555D6662E5459016C	Editor ID: 002-883-387-8
Batch ID: 09-8554-2153	Test Type: Development-Survival	Analyst:
Start Date: 06 Sep-23 13:40	Protocol: EPA/600/R-95/136 (1995)	Diluent: Diluted Natural Seawater
Ending Date: 08 Sep-23 14:30	Species: Mytilis galloprovincialis	Brine: Not Applicable
Test Length: 49h	Taxon:	Source: Field Collected Age:
Sample ID: 09-1540-7899	Code: 230906mgrdNH3	Project:
Sample Date: 06 Sep-23	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 06 Sep-23	CAS (PC):	Station:
Sample Age: 14h	Client: Internal	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	7.43	17.93	11.54	---	0.03566	3.87%

Dunnett Multiple Comparison Test

Control	vs	Conc-mg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Lab Control		1.54	8	-0.4099	2.407	0.06219	CDF	0.9403	Non-Significant Effect
		3.07	8	-0.6784	2.407	0.06219	CDF	0.9696	Non-Significant Effect
		4.33	8	-0.7598	2.407	0.06219	CDF	0.9756	Non-Significant Effect
		5.88*	8	2.782	2.407	0.06219	CDF	0.0223	Significant Effect
		7.43	8	1.317	2.407	0.06219	CDF	0.3145	Non-Significant Effect
		17.93*	8	46.69	2.407	0.06219	CDF	<1.0E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.16914	1.02819	6	616.3	<1.0E-05	Significant Effect
Error	0.0467148	0.0016684	28			
Total	6.21586		34			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	3.115	16.81	0.7943	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9774	0.9146	0.6739	Normal Distribution

Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	0.9217	0.8976	0.9458	0.9300	0.8876	0.9343	0.0087	2.11%	0.00%
1.54		5	0.9275	0.9092	0.9458	0.9296	0.9038	0.9438	0.0066	1.59%	-0.63%
3.07		5	0.9309	0.9116	0.9502	0.9313	0.9120	0.9492	0.0070	1.67%	-1.00%
4.33		5	0.9315	0.9060	0.9570	0.9366	0.9023	0.9504	0.0092	2.20%	-1.07%
5.88		5	0.8778	0.8337	0.9220	0.8693	0.8344	0.9300	0.0159	4.05%	4.76%
7.43		5	0.9025	0.8767	0.9282	0.9000	0.8764	0.9341	0.0093	2.30%	2.09%
17.93		5	0.0085	0.0000	0.0202	0.0078	0.0000	0.0227	0.0042	111.58%	99.08%

Angular (Corrected) Transformed Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	1.2890	1.2460	1.3310	1.3030	1.2290	1.3120	0.0153	2.65%	0.00%
1.54		5	1.2990	1.2650	1.3340	1.3020	1.2560	1.3310	0.0124	2.14%	-0.82%
3.07		5	1.3060	1.2680	1.3440	1.3060	1.2700	1.3430	0.0138	2.36%	-1.36%
4.33		5	1.3080	1.2590	1.3580	1.3160	1.2530	1.3460	0.0179	3.06%	-1.52%
5.88		5	1.2170	1.1460	1.2870	1.2010	1.1520	1.3030	0.0253	4.65%	5.58%
7.43		5	1.2550	1.2100	1.2990	1.2490	1.2120	1.3110	0.0161	2.87%	2.64%
17.93		5	0.0823	0.0180	0.1466	0.0887	0.0307	0.1513	0.0232	62.89%	93.61%

CETIS Analytical Report

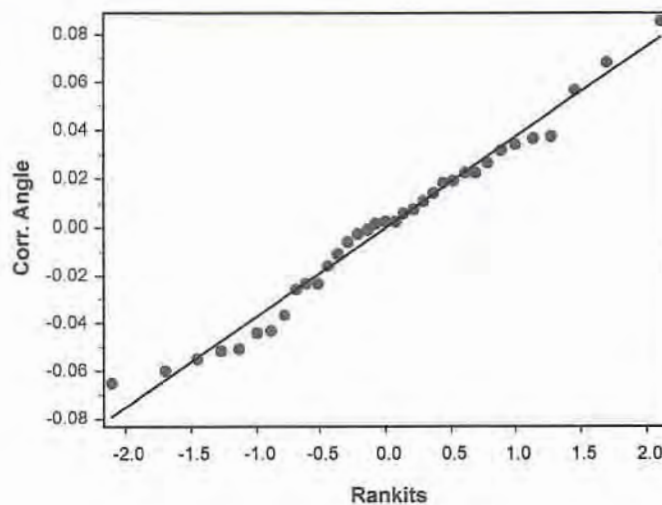
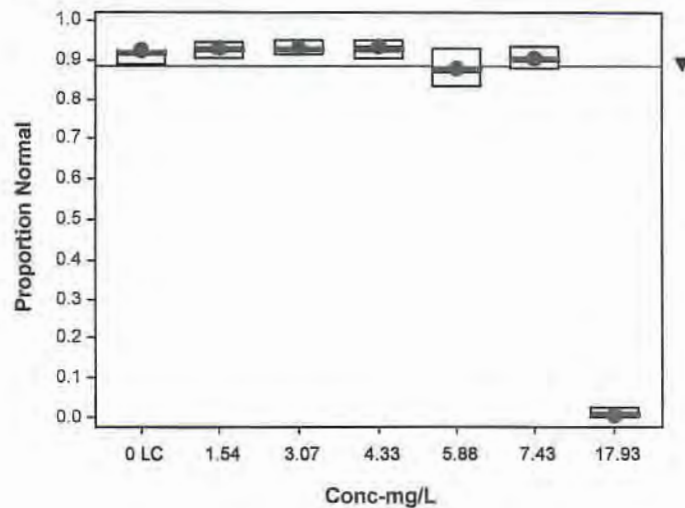
Report Date: 14 Dec-23 15:35 (p 4 of 6)
Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 10-1023-8814	Endpoint: Proportion Normal	CETIS Version: CETIS v2.1.5
Analyzed: 14 Dec-23 15:34	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 11 Dec-23 10:08	MD5 Hash: B59396525CE5F46555D6662E5459016C	Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

 Report Date: 14 Dec-23 15:35 (p 5 of 6)
 Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 15-8927-6619	Endpoint: Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 14 Dec-23 15:34	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 11 Dec-23 10:08	MD5 Hash: 19AA65BBF501CA3033138C1F241D99FF	Editor ID: 002-883-387-8
Batch ID: 09-8554-2153	Test Type: Development-Survival	Analyst:
Start Date: 06 Sep-23 13:40	Protocol: EPA/600/R-95/136 (1995)	Diluent: Diluted Natural Seawater
Ending Date: 08 Sep-23 14:30	Species: Mytilus galloprovincialis	Brine: Not Applicable
Test Length: 49h	Taxon:	Source: Field Collected Age:
Sample ID: 09-1540-7899	Code: 230906mgrdNH3	Project:
Sample Date: 06 Sep-23	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 06 Sep-23	CAS (PC):	Station:
Sample Age: 14h	Client: Internal	

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	7.43	17.93	11.54	---	0.02033	2.03%

Steel Many-One Rank Sum Test

Control	vs	Conc-mg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)
Lab Control		1.54	8	25	16	1	CDF	0.6693	Non-Significant Effect
		3.07	8	17.5	16	1	CDF	0.0792	Non-Significant Effect
		4.33	8	20	16	1	CDF	0.2114	Non-Significant Effect
		5.88	8	25	16	1	CDF	0.6693	Non-Significant Effect
		7.43	8	20	16	1	CDF	0.2114	Non-Significant Effect
		17.93*	8	15	16	0	CDF	0.0222	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0851494	0.0141916	6	2.603	0.0393	Significant Effect
Error	0.15267	0.0054525	28			
Total	0.23782		34			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test				Indeterminate
Distribution	Shapiro-Wilk W Normality Test	0.9571	0.9146	0.1870	Normal Distribution

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	0.00%
1.54		5	0.9955	0.9830	1.0000	1.0000	0.9774	1.0000	0.0045	1.01%	0.45%
3.07		5	0.9684	0.9308	1.0000	0.9850	0.9323	1.0000	0.0135	3.12%	3.16%
4.33		5	0.9812	0.9565	1.0000	0.9850	0.9586	1.0000	0.0089	2.03%	1.88%
5.88		5	0.9932	0.9744	1.0000	1.0000	0.9662	1.0000	0.0068	1.52%	0.68%
7.43		5	0.9842	0.9660	1.0000	0.9774	0.9699	1.0000	0.0066	1.49%	1.58%
17.93		5	0.9647	0.9275	1.0000	0.9586	0.9248	0.9962	0.0134	3.10%	3.53%

Angular (Corrected) Transformed Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	1.5400	1.5400	1.5400	1.5400	1.5400	1.5400	0.0000	0.00%	0.00%
1.54		5	1.5160	1.4490	1.5830	1.5400	1.4200	1.5400	0.0240	3.54%	1.56%
3.07		5	1.4130	1.2930	1.5340	1.4480	1.3080	1.5400	0.0435	6.88%	8.24%
4.33		5	1.4540	1.3490	1.5590	1.4480	1.3660	1.5400	0.0379	5.83%	5.60%
5.88		5	1.5090	1.4240	1.5950	1.5400	1.3860	1.5400	0.0309	4.57%	2.00%
7.43		5	1.4610	1.3710	1.5510	1.4200	1.3960	1.5400	0.0326	4.98%	5.14%
17.93		5	1.4000	1.2850	1.5150	1.3660	1.2930	1.5090	0.0414	6.62%	9.09%

CETIS Analytical Report

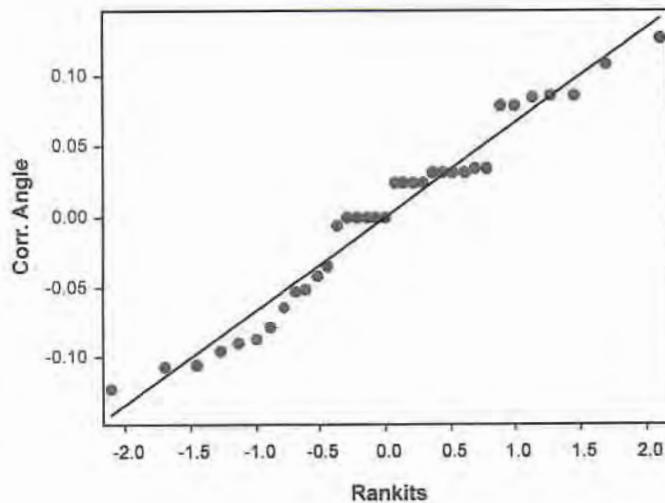
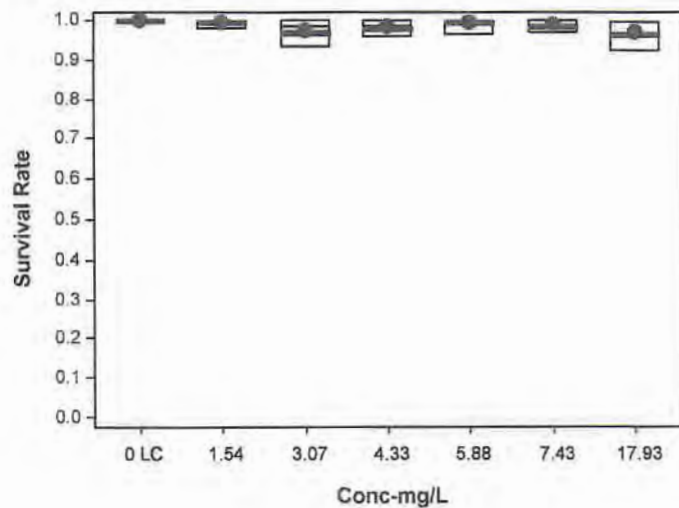
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Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 15-8927-6619	Endpoint: Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 14 Dec-23 15:34	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 11 Dec-23 10:08	MD5 Hash: 19AA65BBF501CA3033138C1F241D99FF	Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

Report Date: 14 Dec-23 15:35 (p 1 of 1)
Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 00-6820-9635 Endpoint: Combined Proportion Normal CETIS Version: CETIS v2.1.5
Analyzed: 14 Dec-23 15:34 Analysis: Trimmed Spearman-Kärber Status Level: 1
Edit Date: 11 Dec-23 10:08 MD5 Hash: ADE60CC2DFF65F31667053731BE58218 Editor ID: 002-883-387-8

Batch ID: 09-8554-2153 Test Type: Development-Survival Analyst:
Start Date: 06 Sep-23 13:40 Protocol: EPA/600/R-95/136 (1995) Diluent: Diluted Natural Seawater
Ending Date: 08 Sep-23 14:30 Species: Mytilis galloprovincialis Brine: Not Applicable
Test Length: 49h Taxon: Source: Field Collected Age:

Sample ID: 09-1540-7899 Code: 230906mgrdNH3 Project:
Sample Date: 06 Sep-23 Material: Total Ammonia Source: Reference Toxicant
Receipt Date: 06 Sep-23 CAS (PC): Station:
Sample Age: 14h Client: Internal

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.07803	0.90%	1.047	0.001799	11.13	11.04	11.23

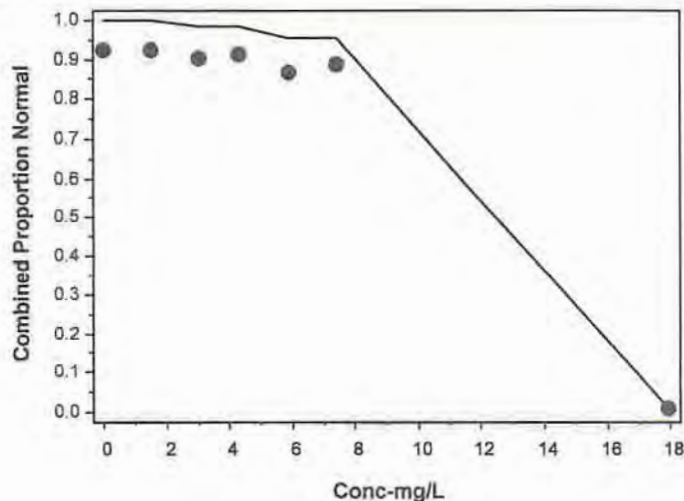
Combined Proportion Normal Summary

Calculated Variate(A/B)

Isotonic Variate

Conc-mg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	LC	5	0.9217	0.9300	0.8876	0.9343	2.11%	0.00%	1276/1384	0.9226	0.00%
1.54		5	0.9234	0.9296	0.8835	0.9438	2.52%	-0.19%	1271/1376	0.9226	0.00%
3.07		5	0.9019	0.9173	0.8571	0.9492	4.70%	2.15%	1246/1379	0.9080	1.58%
4.33		5	0.9140	0.9194	0.8684	0.9366	3.06%	0.83%	1258/1376	0.9080	1.58%
5.88		5	0.8715	0.8693	0.8344	0.8985	2.91%	5.44%	1301/1495	0.8799	4.63%
7.43		5	0.8882	0.8972	0.8534	0.9060	2.49%	3.64%	1211/1363	0.8799	4.63%
17.93		5	0.0083	0.0075	0.0000	0.0226	113.18%	99.10%	11/1330	0.0083	99.10%

Graphics



Bivalve Larval Survival and Development Test

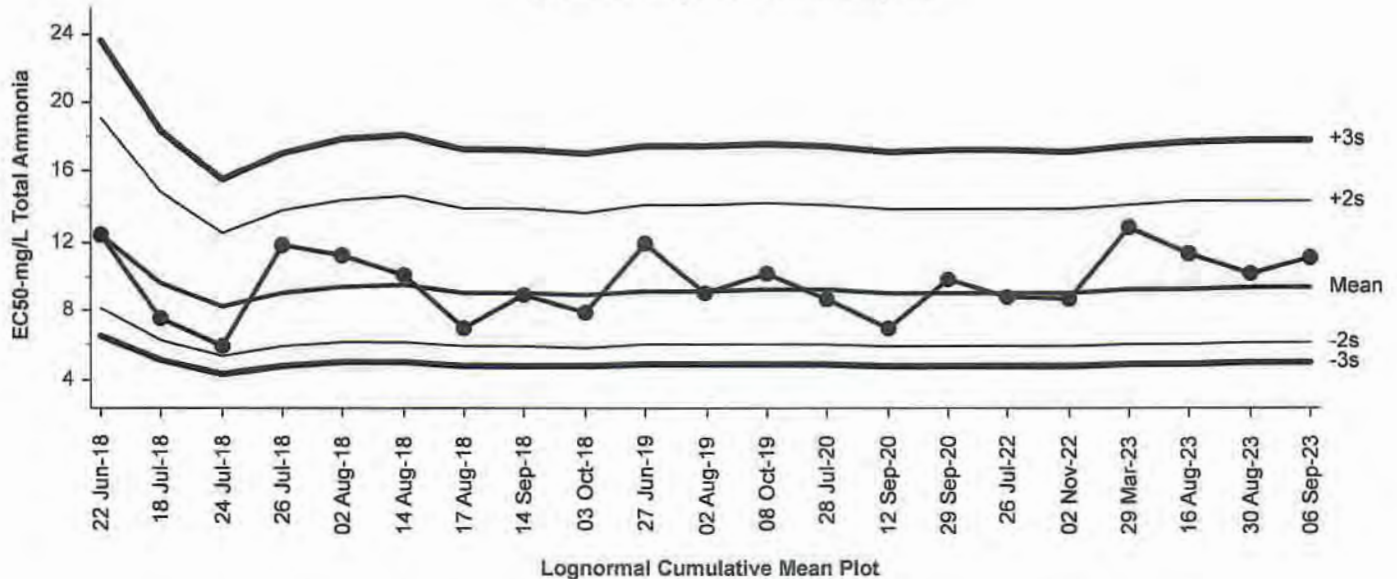
All Matching Labs

Test Type: Development-Survival
Protocol: EPA/600/R-95/136 (1995)

Organism: *Mytilus galloprovincialis*
Endpoint: Combined Proportion Normal

Material: Total Ammonia
Source: Reference Toxicant-REF

Bivalve Larval Survival and Development Test
Combined Proportion Normal Endpoint



Mean: 9.412 Count: 20 -2s Warning Limit: 6.13 -3s Action Limit: 4.95
Sigma: NA CV: 21.70% +2s Warning Limit: 14.4 +3s Action Limit: 17.9

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2018	Jun	22	18:15	12.41	3.003	1.293			14-3626-7506	07-2831-7429	Wood E&IS
2		Jul	18	13:10	7.574	-1.838	-1.015			14-1933-2999	09-8220-2485	Wood E&IS
3			24	0:00	5.919	-3.493	-2.166	(-)		06-2214-9289	19-4459-2946	Aquatic Bioassay & Consu
4			26	15:30	11.91	2.502	1.101			04-4750-3360	07-2492-6358	Wood E&IS
5		Aug	2	14:15	11.26	1.851	0.8386			15-4398-7435	08-1276-4615	Wood E&IS
6			14	14:15	10.09	0.6751	0.3236			06-7156-7887	14-6273-7305	Wood E&IS
7			17	17:15	6.994	-2.419	-1.387			03-5411-9632	11-7669-9942	Wood E&IS
8		Sep	14	15:00	9.017	-0.3951	-0.2003			17-8327-4430	05-1718-6773	Wood E&IS
9		Oct	3	15:20	7.902	-1.51	-0.8168			17-8768-6287	19-9418-2380	Wood E&IS
10	2019	Jun	27	15:45	11.99	2.575	1.13			05-1883-7419	17-3403-8072	Wood E&IS
11		Aug	2	0:00	9.077	-0.3352	-0.1694			03-9120-6967	06-1839-4155	Wood E&IS
12		Oct	8	15:30	10.29	0.8753	0.4153			17-9246-6483	01-1723-7825	Wood E&IS
13	2020	Jul	28	17:00	8.755	-0.6566	-0.3378			09-5299-4651	16-9371-3551	Wood E&IS
14		Sep	12	18:15	6.938	-2.474	-1.424			02-4404-7341	15-1829-1450	Wood E&IS
15			29	14:50	9.876	0.4637	0.2246			05-6391-7157	09-8035-0927	Wood E&IS
16	2022	Jul	26	16:00	8.89	-0.5219	-0.2664			05-0315-2040	03-8123-7745	Wood E&IS
17		Nov	2	16:20	8.766	-0.6458	-0.332			06-5398-2454	19-7795-7920	WSP Laboratory
18	2023	Mar	29	0:00	12.86	3.446	1.457			11-1983-2594	18-5493-4487	WSP Laboratory
19		Aug	16	15:15	11.42	2.011	0.9042			10-1256-9161	01-6470-5988	WSP Laboratory
20			30	14:15	10.25	0.8403	0.3994			08-9311-6369	09-6947-9254	WSP Laboratory
21		Sep	6	13:40	11.13	1.721	0.7841			03-7157-8414	11-4706-8760	WSP Laboratory

Water Quality for Bivalve Development

Client: Internal
Project ID: NH₃ Reftox
Test No. 230906mgrdNH3

Test Species: *M. galloprovincialis*
Start Date/Time: 9/6/2023 1340
End Date/Time: 9/8/2023 1430

Concentration (mg/L)	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
Lab Control	Temp. (°C)	15.6	14.2	14.0
	Salinity (ppt)	31.0	31.8	32.0
	pH (units)	7.80	7.72	7.51
	DO (mg/L)	7.0	8.1	7.9
2	Temp. (°C)	15.5	14.2	14.5
	Salinity (ppt)	31.2	32.7	33.6
	pH (units)	7.73	7.72	7.56
	DO (mg/L)	7.3	8.1	8.0
4	Temp. (°C)	15.6	14.1	14.1
	Salinity (ppt)	31.1	32.9	33.9
	pH (units)	7.73	7.71	7.58
	DO (mg/L)	7.3	8.2	8.0
6	Temp. (°C)	15.8	14.1	14.0
	Salinity (ppt)	31.0	32.7	33.7
	pH (units)	7.73	7.71	7.59
	DO (mg/L)	7.4	8.2	8.0
8	Temp. (°C)	15.9	14.0	13.9
	Salinity (ppt)	30.8	32.8	33.8
	pH (units)	7.73	7.71	7.59
	DO (mg/L)	7.3	8.2	8.0
10	Temp. (°C)	16.0	14.0	13.7
	Salinity (ppt)	30.9	32.9	33.9
	pH (units)	7.72	7.70	7.59
	DO (mg/L)	7.2	8.3	8.0
20	Temp. (°C)	16.1	14.0	13.7
	Salinity (ppt)	30.7	32.7	33.9
	pH (units)	7.71	7.68	7.57
	DO (mg/L)	7.2	8.2	8.1
Tech Initials:		JF	KYB	RJ

Source of Animals: Mission Bay/NIWC

Date Received: 8/29/23

Comments:

QC Check: JF 12/8/23

Final Review: MK 12/26/23

CETIS Test Data Worksheet

Report Date: 05 Sep-23 17:34 (p 1 of 1)
 Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test

WSP Laboratory

Start Date: 06 Sep-23 Species: Mytilus galloprovincialis Sample Code: 230906mgrdNH3
 End Date: 08 Sep-23 Protocol: EPA/600/R-95/136 (1995) Sample Source: Reference Toxicant
 Sample Date: 06 Sep-23 Material: Total Ammonia Sample Station:

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
			1			286	267	HK 10/11/23
			2			268	251	
			3			255	242	
			4			252 267	252	
			5			256	231	
			6			2860	234	
			7			262	249	
			8			273	253	
			9			331 274	158 286	
			10			259	227	
			11			300	279	HK 10/11/23
			12			267	237	
			13			295	263	
			14			310	285	
			15			284	264	
			16			260	235	
			17			282	253	
			18			250	228	
			19			262	247	
			20			283	246	
			21			283	256	
			22			267	249	
			23			276	255	
			24			262	244	
			25			320	267	
			26			264	6	
			27			257	239	
			28			275	2	
			29			253	3	
			30			246	0	
			31			246	228	
			32			258	241	
			33			274	256	
			34			265	0	
			35			315	299	

QCE 239/255
 TK average = 266

CETIS Test Data Worksheet

Report Date: 05 Sep-23 17:34 (p 1 of 1)
 Test Code/ID: 230906mgrdNH3 / 03-7157-8414

Bivalve Larval Survival and Development Test				WSP Laboratory	
Start Date: 06 Sep-23	Species: Mytilus galloprovincialis	Sample Code: 230906mgrdNH3			
End Date: 08 Sep-23	Protocol: EPA/600/R-95/136 (1995)	Sample Source: Reference Toxicant			
Sample Date: 06 Sep-23	Material: Total Ammonia	Sample Station:			

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
0	LC	1	33					
0	LC	2	11					
0	LC	3	12					
0	LC	4	23					
0	LC	5	22					
2		1	15					
2		2	4					
2		3	8					
2		4	16					
2		5	1					
4		1	31					
4		2	19					
4		3	18					
4		4	35					
4		5	24					
6		1	14					
6		2	3					
6		3	5					
6		4	7					
6		5	2					
8		1	13					
8		2	20					
8		3	25					
8		4	9					
8		5	27					
10		1	21					
10		2	17					
10		3	6					
10		4	10					
10		5	32					
20		1	34					
20		2	28					
20		3	30					
20		4	26					
20		5	29					

QC: P/b

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Project ID: NH3 Reftox

Test No.: 230903mgrdNH3

DI Blank: 0.0

Test Species: ~~E. estuarius~~ M. galloprovincialis

Start Date: 9/6/2023 1340

End Date: 9/8/2023 1430

10 mg/L Ammonia Stock: 9.0

(x1.22)

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

QC Check: JF 12/8/23

Final Review: M/C 12/26/23

[illegible]

Bivalve Reference Toxicant
48-hr Survival & Development
9/14/23

CETIS Summary Report

Report Date: 21 Dec-23 13:33 (p 1 of 2)
Test Code/ID: 230914mgrdNH3 / 00-4405-6464

Bivalve Larval Survival and Development Test

WSP Laboratory

Batch ID: 01-1215-8573	Test Type: Development-Survival	Analyst:
Start Date: 14 Sep-23 14:40	Protocol: EPA/600/R-95/136 (1995)	Diluent: Diluted Natural Seawater
Ending Date: 16 Sep-23 13:00	Species: Mytilus galloprovincialis	Brine: Not Applicable
Test Length: 46h	Taxon:	Source: Field Collected
		Age:
Sample ID: 03-9780-3722	Code: 230914mgrdNH3	Project:
Sample Date: 14 Sep-23	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 14 Sep-23	CAS (PC):	Station: In House
Sample Age: 15h	Client: Internal	

Comments: second concentration is nominal value

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD
08-7467-6827	Combined Proportion Normal	Dunnett Multiple Comparison Test	8.91	17.57	12.51	7.7%
14-7594-4722	Proportion Normal	Dunnett Multiple Comparison Test	7.69	8.91	8.278	5.85%
11-1712-3501	Survival Rate	Dunnett Multiple Comparison Test	8.91	17.57	12.51	6.35%

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL
14-6380-0834	Combined Proportion Normal	Trimmed Spearman-Kärber	EC50	12.33	12.24	12.41

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
14-7594-4722	Proportion Normal	Control Resp	0.9424	0.9	>>	Yes	Passes Criteria
11-1712-3501	Survival Rate	Control Resp	0.9627	0.5	>>	Yes	Passes Criteria
08-7467-6827	Combined Proportion Normal	PMSD	0.07698	<<	0.25	No	Passes Criteria

Combined Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0.495	LC	5	0.9075	0.8485	0.9664	0.8508	0.9506	0.0212	0.0475	5.23%	0.00%
0.49		5	0.9023	0.8592	0.9453	0.8644	0.9404	0.0155	0.0347	3.84%	0.57%
4.15		5	0.8828	0.8406	0.9249	0.8305	0.9115	0.0152	0.0339	3.84%	2.72%
5.25		5	0.9068	0.8548	0.9588	0.8644	0.9587	0.0187	0.0419	4.62%	0.07%
7.69		5	0.9055	0.8705	0.9405	0.8678	0.9356	0.0126	0.0282	3.11%	0.22%
8.91		5	0.8456	0.7976	0.8937	0.8034	0.8893	0.0173	0.0387	4.58%	6.81%
17.57		5	0.0292	-0.0256	0.0839	0.0000	0.1051	0.0197	0.0441	151.30%	96.79%

Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0.495	LC	5	0.9424	0.9300	0.9549	0.9270	0.9517	0.0045	0.0100	1.07%	0.00%
0.49		5	0.9148	0.8810	0.9486	0.8839	0.9404	0.0122	0.0272	2.97%	2.93%
4.15		5	0.9212	0.8885	0.9539	0.8956	0.9606	0.0118	0.0263	2.86%	2.25%
5.25		5	0.9160	0.8739	0.9581	0.8703	0.9587	0.0152	0.0339	3.70%	2.81%
7.69		5	0.9242	0.8912	0.9571	0.8893	0.9517	0.0119	0.0266	2.87%	1.94%
8.91		5	0.8793	0.8365	0.9221	0.8207	0.9101	0.0154	0.0344	3.92%	6.70%
17.57		5	0.0320	-0.0279	0.0919	0.0000	0.1152	0.0216	0.0483	150.78%	96.60%

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0.495	LC	5	0.9627	0.9070	1.0180	0.9017	1.0000	0.0201	0.0449	4.66%	0.00%
0.49		5	0.9864	0.9511	1.0220	0.9356	1.0000	0.0127	0.0285	2.89%	-2.46%
4.15		5	0.9586	0.9102	1.0070	0.9186	1.0000	0.0174	0.0390	4.07%	0.42%
5.25		5	0.9898	0.9660	1.0140	0.9559	1.0000	0.0086	0.0192	1.94%	-2.82%
7.69		5	0.9803	0.9325	1.0280	0.9119	1.0000	0.0172	0.0385	3.93%	-1.83%
8.91		5	0.9620	0.9186	1.0060	0.9119	1.0000	0.0157	0.0350	3.64%	0.07%
17.57		5	0.8766	0.8221	0.9311	0.8203	0.9288	0.0196	0.0439	5.01%	8.94%

CETIS Summary Report

Report Date: 21 Dec-23 13:33 (p 2 of 2)
Test Code/ID: 230914mgrdNH3 / 00-4405-6464

Bivalve Larval Survival and Development Test

WSP Laboratory

Combined Proportion Normal Detail

MD5: CA4541B22180E396501AF361D1305EB6

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0 4.4 JS	LC	0.8610	0.9392	0.8508	0.9506	0.9356
0.49		0.9379	0.8847	0.8839	0.9404	0.8644
4.15		0.8305	0.9085	0.8678	0.8956	0.9115
5.25		0.8644	0.9383	0.9048	0.8678	0.9587
7.69		0.9356	0.8678	0.9297	0.8893	0.9049
8.91		0.8712	0.8576	0.8034	0.8068	0.8893
17.57		0.1051	0.0034	0.0305	0.0000	0.0068

Proportion Normal Detail

MD5: E4B3B1504404D0C92378B286C7402FE5

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0 4.4 JS	LC	0.9270	0.9392	0.9436	0.9506	0.9517
0.49		0.9379	0.8878	0.8839	0.9404	0.9239
4.15		0.9041	0.9606	0.9343	0.8956	0.9115
5.25		0.8703	0.9383	0.9048	0.9078	0.9587
7.69		0.9452	0.9517	0.9297	0.8893	0.9049
8.91		0.8955	0.9101	0.8810	0.8207	0.8893
17.57		0.1152	0.0041	0.0329	0.0000	0.0078

Survival Rate Detail

MD5: 22ADEE4884D1123A9ADF2CAECF737D81

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0 4.4 JS	LC	0.9288	1.0000	0.9017	1.0000	0.9831
0.49		1.0000	0.9966	1.0000	1.0000	0.9356
4.15		0.9186	0.9458	0.9288	1.0000	1.0000
5.25		0.9932	1.0000	1.0000	0.9559	1.0000
7.69		0.9898	0.9119	1.0000	1.0000	1.0000
8.91		0.9729	0.9424	0.9119	0.9831	1.0000
17.57		0.9119	0.8203	0.9288	0.8542	0.8678

CETIS Analytical Report

Report Date: 21 Dec-23 13:33 (p 1 of 6)
Test Code/ID: 230914mgrdNH3 / 00-4405-6464

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 08-7467-6827 Endpoint: Combined Proportion Normal CETIS Version: CETIS v2.1.5
Analyzed: 21 Dec-23 13:32 Analysis: Parametric-Control vs Treatments Status Level: 1
Edit Date: 15 Dec-23 0:00 MD5 Hash: CA4541B22180E396501AF361D1305EB6 Editor ID: 002-883-387-8

Batch ID: 01-1215-8573 Test Type: Development-Survival Analyst:
Start Date: 14 Sep-23 14:40 Protocol: EPA/600/R-95/136 (1995) Diluent: Diluted Natural Seawater
Ending Date: 16 Sep-23 13:00 Species: Mytilus galloprovincialis Brine: Not Applicable
Test Length: 46h Taxon: Source: Field Collected Age:

Sample ID: 03-9780-3722 Code: 230914mgrdNH3 Project:
Sample Date: 14 Sep-23 Material: Total Ammonia Source: Reference Toxicant
Receipt Date: 14 Sep-23 CAS (PC): Station: In House
Sample Age: 15h Client: Internal

Comments: second concentration is nominal value

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	8.91	17.57	12.51	---	0.06986	7.70%

Dunnett Multiple Comparison Test

Control	vs	Conc-mg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Lab Control		0.49	8	0.2607	2.407	0.1131	CDF	0.7748	Non-Significant Effect
		4.15	8	0.9644	2.407	0.1131	CDF	0.4686	Non-Significant Effect
		5.25	8	0.04351	2.407	0.1131	CDF	0.8450	Non-Significant Effect
		7.69	8	0.176	2.407	0.1131	CDF	0.8041	Non-Significant Effect
		8.91	8	2.126	2.407	0.1131	CDF	0.0870	Non-Significant Effect
		17.57*	8	24.14	2.407	0.1131	CDF	<1.0E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.2808	0.880133	6	159.5	<1.0E-05	Significant Effect
Error	0.154522	0.0055186	28			
Total	5.43532		34			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	5.382	16.81	0.4958	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9374	0.9146	0.0466	Normal Distribution

Combined Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0 4.15	LC	5	0.9075	0.8485	0.9664	0.9356	0.8508	0.9506	0.0212	5.23%	0.00%
0.49		5	0.9023	0.8592	0.9453	0.8847	0.8644	0.9404	0.0155	3.84%	0.57%
4.15		5	0.8828	0.8406	0.9249	0.8956	0.8305	0.9115	0.0152	3.84%	2.72%
5.25		5	0.9068	0.8548	0.9588	0.9048	0.8644	0.9587	0.0187	4.62%	0.07%
7.69		5	0.9055	0.8705	0.9405	0.9049	0.8678	0.9356	0.0126	3.11%	0.22%
8.91		5	0.8456	0.7976	0.8937	0.8576	0.8034	0.8893	0.0173	4.58%	6.81%
17.57		5	0.0292	0.0000	0.0839	0.0068	0.0000	0.1051	0.0197	151.30%	96.79%

Angular (Corrected) Transformed Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0 4.15	LC	5	1.2690	1.1690	1.3700	1.3140	1.1740	1.3470	0.0362	6.38%	0.00%
0.49		5	1.2570	1.1820	1.3320	1.2240	1.1940	1.3240	0.0270	4.80%	0.97%
4.15		5	1.2240	1.1600	1.2870	1.2420	1.1460	1.2690	0.0229	4.19%	3.57%
5.25		5	1.2670	1.1730	1.3610	1.2570	1.1940	1.3660	0.0337	5.95%	0.16%
7.69		5	1.2610	1.2010	1.3210	1.2570	1.1990	1.3140	0.0216	3.83%	0.65%
8.91		5	1.1690	1.1030	1.2360	1.1840	1.1110	1.2320	0.0240	4.59%	7.87%
17.57		5	0.1351	-0.0165	0.2866	0.0824	0.0291	0.3301	0.0546	90.34%	89.35%

CETIS Analytical Report

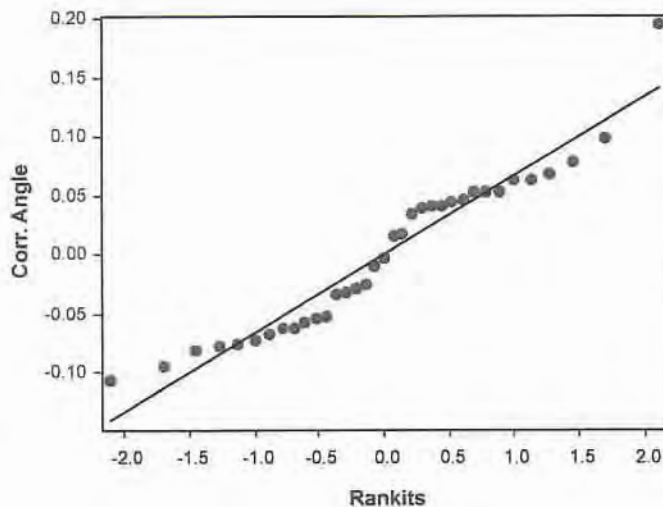
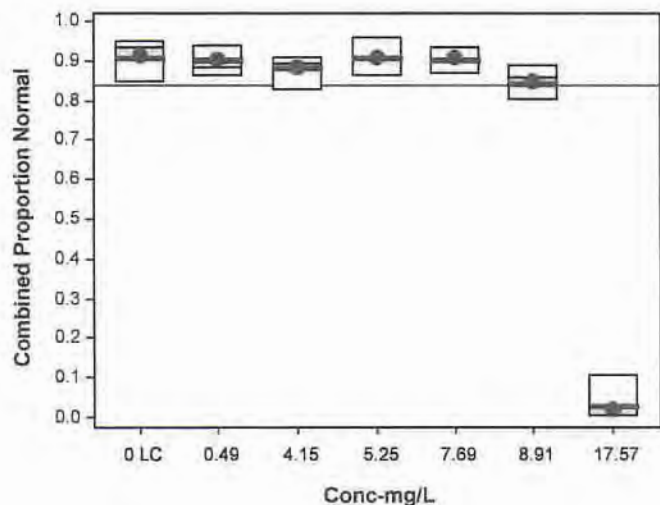
Report Date: 21 Dec-23 13:33 (p 2 of 6)
Test Code/ID: 230914mgrdNH3 / 00-4405-6464

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 08-7467-6827	Endpoint: Combined Proportion Normal	CETIS Version: CETIS v2.1.5
Analyzed: 21 Dec-23 13:32	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 15 Dec-23 0:00	MD5 Hash: CA4541B22180E396501AF361D1305EB6	Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

Report Date: 21 Dec-23 13:33 (p 3 of 6)
 Test Code/ID: 230914mgrdNH3 / 00-4405-6464

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 14-7594-4722 Endpoint: Proportion Normal CETIS Version: CETIS v2.1.5
 Analyzed: 21 Dec-23 13:33 Analysis: Parametric-Control vs Treatments Status Level: 1
 Edit Date: 15 Dec-23 0:00 MD5 Hash: E4B3B1504404D0C92378B286C7402FE5 Editor ID: 002-883-387-8

Batch ID: 01-1215-8573 Test Type: Development-Survival Analyst:
 Start Date: 14 Sep-23 14:40 Protocol: EPA/600/R-95/136 (1995) Diluent: Diluted Natural Seawater
 Ending Date: 16 Sep-23 13:00 Species: Mytilus galloprovincialis Brine: Not Applicable
 Test Length: 46h Taxon: Source: Field Collected Age:

Sample ID: 03-9780-3722 Code: 230914mgrdNH3 Project:
 Sample Date: 14 Sep-23 Material: Total Ammonia Source: Reference Toxicant
 Receipt Date: 14 Sep-23 CAS (PC): Station: In House
 Sample Age: 15h Client: Internal

Comments: second concentration is nominal value

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	7.69	8.91	8.278	---	0.05516	5.85%

Dunnett Multiple Comparison Test

Control	vs	Conc-mg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Lab Control		0.49	8	1.238	2.407	0.1008	CDF	0.3469	Non-Significant Effect
		4.15	8	0.9414	2.407	0.1008	CDF	0.4793	Non-Significant Effect
		5.25	8	1.138	2.407	0.1008	CDF	0.3901	Non-Significant Effect
		7.69	8	0.8161	2.407	0.1008	CDF	0.5377	Non-Significant Effect
		8.91*	8	2.648	2.407	0.1008	CDF	0.0300	Significant Effect
		17.57*	8	28.34	2.407	0.1008	CDF	<1.0E-05	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5.59523	0.932538	6	212.8	<1.0E-05	Significant Effect
Error	0.122685	0.0043816	28			
Total	5.71792		34			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	11.96	16.81	0.0630	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9426	0.9146	0.0672	Normal Distribution

Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0.49 JS	LC	5	0.9424	0.9300	0.9549	0.9436	0.9270	0.9517	0.0045	1.07%	0.00%
0.49		5	0.9148	0.8810	0.9486	0.9239	0.8839	0.9404	0.0122	2.97%	2.93%
4.15		5	0.9212	0.8885	0.9539	0.9115	0.8956	0.9606	0.0118	2.86%	2.25%
5.25		5	0.9160	0.8739	0.9581	0.9078	0.8703	0.9587	0.0152	3.70%	2.81%
7.69		5	0.9242	0.8912	0.9571	0.9297	0.8893	0.9517	0.0119	2.87%	1.94%
8.91		5	0.8793	0.8365	0.9221	0.8893	0.8207	0.9101	0.0154	3.92%	6.70%
17.57		5	0.0320	0.0000	0.0919	0.0078	0.0000	0.1152	0.0216	150.78%	96.60%

Angular (Corrected) Transformed Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0.49 JS	LC	5	1.3290	1.3030	1.3550	1.3310	1.2970	1.3490	0.0095	1.59%	0.00%
0.49		5	1.2770	1.2170	1.3380	1.2910	1.2230	1.3240	0.0217	3.79%	3.90%
4.15		5	1.2900	1.2250	1.3550	1.2690	1.2420	1.3710	0.0234	4.06%	2.97%
5.25		5	1.2820	1.2030	1.3600	1.2620	1.2020	1.3660	0.0282	4.91%	3.58%
7.69		5	1.2950	1.2330	1.3570	1.3020	1.2320	1.3490	0.0224	3.86%	2.57%
8.91		5	1.2180	1.1560	1.2810	1.2320	1.1340	1.2660	0.0226	4.14%	8.34%
17.57		5	0.1426	-0.0151	0.3002	0.0885	0.0315	0.3464	0.0568	89.05%	89.27%

CETIS Analytical Report

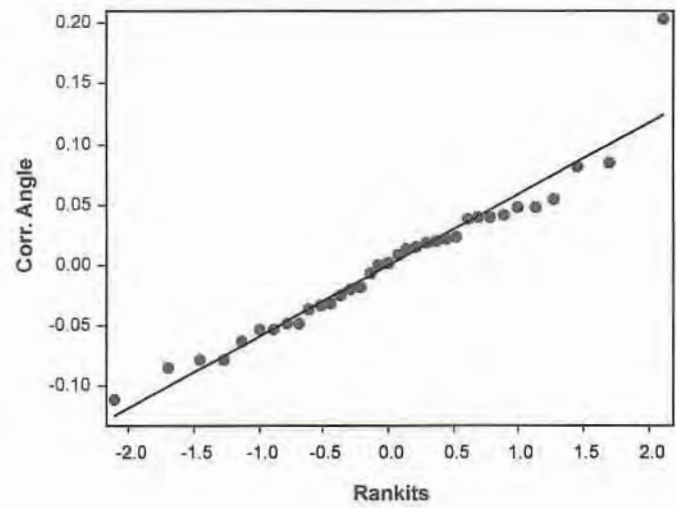
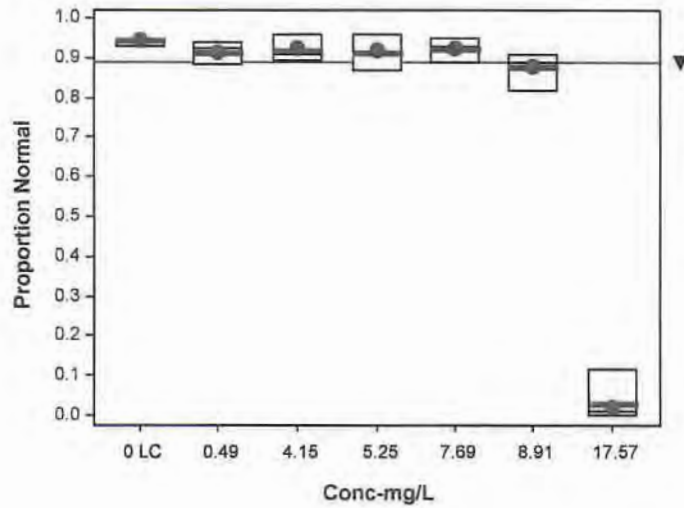
Report Date: 21 Dec-23 13:33 (p 4 of 6)
Test Code/ID: 230914mgrdNH3 / 00-4405-6464

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 14-7594-4722 Endpoint: Proportion Normal CETIS Version: CETIS v2.1.5
Analyzed: 21 Dec-23 13:33 Analysis: Parametric-Control vs Treatments Status Level: 1
Edit Date: 15 Dec-23 0:00 MD5 Hash: E4B3B1504404D0C92378B286C7402FE5 Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

 Report Date: 21 Dec-23 13:33 (p 5 of 6)
 Test Code/ID: 230914mgrdNH3 / 00-4405-6464

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 11-1712-3501	Endpoint: Survival Rate	CETIS Version: CETIS v2.1.5
Analyzed: 21 Dec-23 13:32	Analysis: Parametric-Control vs Treatments	Status Level: 1
Edit Date: 15 Dec-23 0:00	MD5 Hash: 22ADEE4884D1123A9ADF2CAECF737D8	Editor ID: 002-883-387-8

Batch ID: 01-1215-8573	Test Type: Development-Survival	Analyst:
Start Date: 14 Sep-23 14:40	Protocol: EPA/600/R-95/136 (1995)	Diluent: Diluted Natural Seawater
Ending Date: 16 Sep-23 13:00	Species: Mytilis galloprovincialis	Brine: Not Applicable
Test Length: 46h	Taxon:	Source: Field Collected Age:

Sample ID: 03-9780-3722	Code: 230914mgrdNH3	Project:
Sample Date: 14 Sep-23	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 14 Sep-23	CAS (PC):	Station: In House
Sample Age: 15h	Client: Internal	

Comments: second concentration is nominal value

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)	C > T	8.91	17.57	12.51	---	0.06112	6.35%

Dunnett Multiple Comparison Test

Control	vs	Conc-mg/L	df	Test Stat	Critical	MSD	P-Type	P-Value	Decision(α:5%)
Lab Control		0.49	8	-1.106	2.407	0.1635	CDF	0.9910	Non-Significant Effect
		4.15	8	0.2203	2.407	0.1635	CDF	0.7891	Non-Significant Effect
		5.25	8	-1.167	2.407	0.1635	CDF	0.9926	Non-Significant Effect
		7.69	8	-0.8479	2.407	0.1635	CDF	0.9809	Non-Significant Effect
		8.91	8	0.2684	2.407	0.1635	CDF	0.7720	Non-Significant Effect
		17.57*	8	2.93	2.407	0.1635	CDF	0.0159	Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.276853	0.0461422	6	3.999	0.0051	Significant Effect
Error	0.323041	0.0115372	28			
Total	0.599894		34			

ANOVA Assumptions Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variance	Bartlett Equality of Variance Test	2.574	16.81	0.8601	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9422	0.9146	0.0654	Normal Distribution

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0.49	LC	5	0.9627	0.9070	1.0000	0.9831	0.9017	1.0000	0.0201	4.66%	0.00%
0.49		5	0.9864	0.9511	1.0000	1.0000	0.9356	1.0000	0.0127	2.89%	-2.46%
4.15		5	0.9586	0.9102	1.0000	0.9458	0.9186	1.0000	0.0174	4.07%	0.42%
5.25		5	0.9898	0.9660	1.0000	1.0000	0.9559	1.0000	0.0086	1.94%	-2.82%
7.69		5	0.9803	0.9325	1.0000	1.0000	0.9119	1.0000	0.0172	3.93%	-1.83%
8.91		5	0.9620	0.9186	1.0000	0.9729	0.9119	1.0000	0.0157	3.64%	0.07%
17.57		5	0.8766	0.8221	0.9311	0.8678	0.8203	0.9288	0.0196	5.01%	8.94%

Angular (Corrected) Transformed Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0.49	LC	5	1.4150	1.2480	1.5820	1.4400	1.2520	1.5420	0.0602	9.51%	0.00%
0.49		5	1.4900	1.3670	1.6140	1.5420	1.3140	1.5420	0.0444	6.66%	-5.31%
4.15		5	1.4000	1.2380	1.5620	1.3360	1.2820	1.5420	0.0584	9.32%	1.06%
5.25		5	1.4950	1.3960	1.5930	1.5420	1.3590	1.5420	0.0354	5.29%	-5.60%
7.69		5	1.4730	1.3260	1.6190	1.5420	1.2690	1.5420	0.0527	8.01%	-4.07%
8.91		5	1.3970	1.2670	1.5270	1.4050	1.2690	1.5420	0.0468	7.50%	1.29%
17.57		5	1.2160	1.1320	1.3010	1.1990	1.1330	1.3010	0.0305	5.60%	14.07%

CETIS Analytical Report

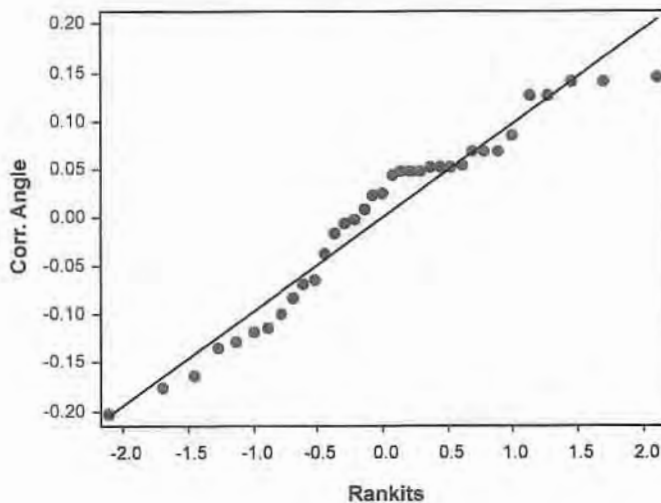
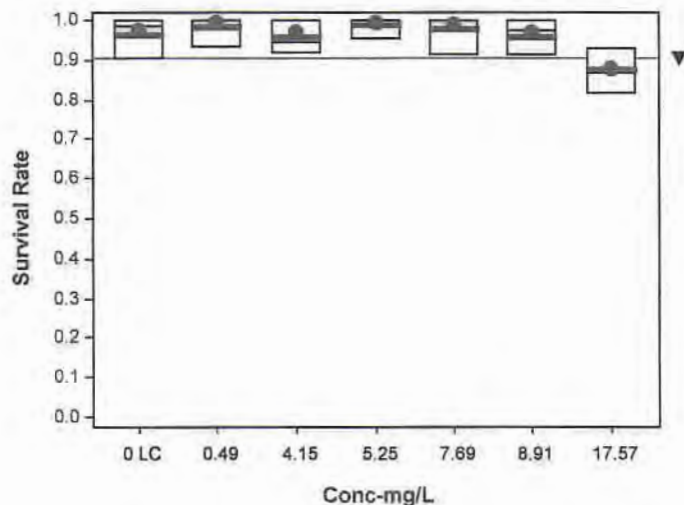
Report Date: 21 Dec-23 13:33 (p 6 of 6)
Test Code/ID: 230914mgrdNH3 / 00-4405-6464

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 11-1712-3501 Endpoint: Survival Rate CETIS Version: CETIS v2.1.5
Analyzed: 21 Dec-23 13:32 Analysis: Parametric-Control vs Treatments Status Level: 1
Edit Date: 15 Dec-23 0:00 MD5 Hash: 22ADEE4884D1123A9ADF2CAECF737D8 Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

Report Date: 21 Dec-23 13:33 (p 1 of 1)
Test Code/ID: 230914mgrdNH3 / 00-4405-6464

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 14-6380-0834 Endpoint: Combined Proportion Normal CETIS Version: CETIS v2.1.5
Analyzed: 21 Dec-23 13:32 Analysis: Trimmed Spearman-Kärber Status Level: 1
Edit Date: 15 Dec-23 0:00 MD5 Hash: CA4541B22180E396501AF361D1305EB6 Editor ID: 002-883-387-8

Batch ID: 01-1215-8573 Test Type: Development-Survival Analyst:
Start Date: 14 Sep-23 14:40 Protocol: EPA/600/R-95/136 (1995) Diluent: Diluted Natural Seawater
Ending Date: 16 Sep-23 13:00 Species: Mytilis galloprovincialis Brine: Not Applicable
Test Length: 46h Taxon: Source: Field Collected Age:

Sample ID: 03-9780-3722 Code: 230914mgrdNH3 Project:
Sample Date: 14 Sep-23 Material: Total Ammonia Source: Reference Toxicant
Receipt Date: 14 Sep-23 CAS (PC): Station: In House
Sample Age: 15h Client: Internal

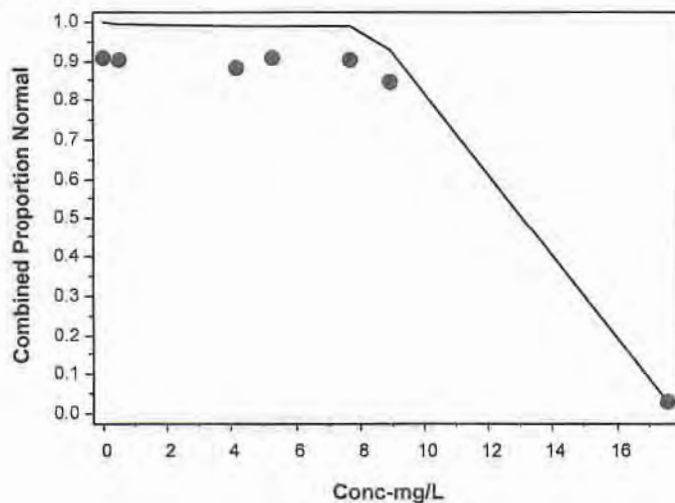
Comments: second concentration is nominal value

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.09169	3.21%	1.091	0.001478	12.33	12.24	12.41

Combined Proportion Normal Summary				Calculated Variate(A/B)					Isotonic Variate		
Conc-mg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	$\Sigma A/\Sigma B$	Mean	%Effect
0.49	LC	5	0.9075	0.9356	0.8508	0.9506	5.23%	0.00%	1367/1505	0.9075	0.00%
0.49		5	0.9023	0.8847	0.8644	0.9404	3.84%	0.57%	1392/1541	0.9023	0.57%
4.15		5	0.8828	0.8956	0.8305	0.9115	3.84%	2.72%	1330/1506	0.8983	1.00%
5.25		5	0.9068	0.9048	0.8644	0.9587	4.62%	0.07%	1402/1544	0.8983	1.00%
7.69		5	0.9055	0.9049	0.8678	0.9356	3.11%	0.22%	1364/1506	0.8983	1.00%
8.91		5	0.8456	0.8576	0.8034	0.8893	4.58%	6.81%	1258/1487	0.8456	6.81%
17.57		5	0.0292	0.0068	0.0000	0.1051	151.30%	96.79%	43/1475	0.0292	96.79%

Graphics



Bivalve Larval Survival and Development Test

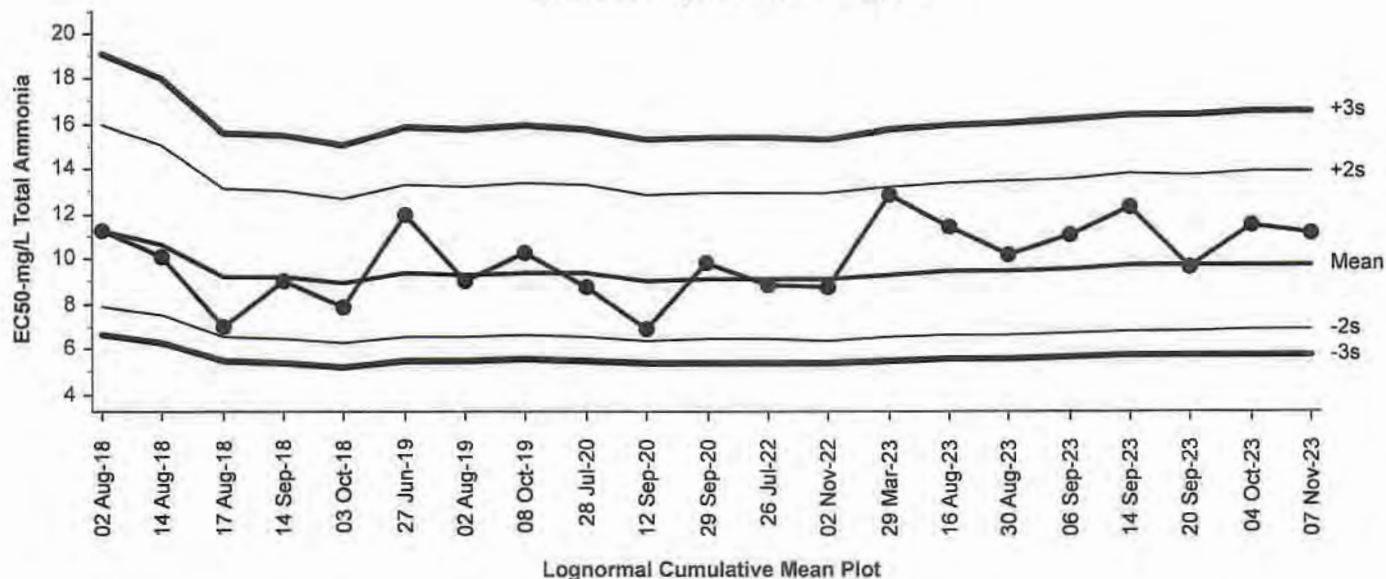
All Matching Labs

Test Type: Development-Survival
Protocol: EPA/600/R-95/136 (1995)

Organism: *Mytilus galloprovincialis*
Endpoint: Combined Proportion Normal

Material: Total Ammonia
Source: Reference Toxicant-REF

Bivalve Larval Survival and Development Test
Combined Proportion Normal Endpoint



Mean: 9.806

Count: 20

-2s Warning Limit: 6.91

-3s Action Limit: 5.8

Sigma: NA

CV: 17.70%

+2s Warning Limit: 13.9

+3s Action Limit: 16.6

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2018	Aug	2	14:15	11.26	1.457	0.7899			15-4398-7435	08-1276-4615	Wood E&IS
2			14	14:15	10.09	0.2812	0.1612			06-7156-7887	14-6273-7305	Wood E&IS
3			17	17:15	6.994	-2.813	-1.927			03-5411-9632	11-7669-9942	Wood E&IS
4		Sep	14	15:00	9.017	-0.789	-0.4782			17-8327-4430	05-1718-6773	Wood E&IS
5		Oct	3	15:20	7.902	-1.904	-1.231			17-8768-6287	19-9418-2380	Wood E&IS
6	2019	Jun	27	15:45	11.99	2.181	1.145			05-1883-7419	17-3403-8072	Wood E&IS
7		Aug	2	0:00	9.077	-0.7291	-0.4405			03-9120-6967	06-1839-4155	Wood E&IS
8		Oct	8	15:30	10.29	0.4814	0.2732			17-9246-6483	01-1723-7825	Wood E&IS
9	2020	Jul	28	17:00	8.755	-1.051	-0.6461			09-5299-4651	16-9371-3551	Wood E&IS
10		Sep	12	18:15	6.938	-2.868	-1.972			02-4404-7341	15-1829-1450	Wood E&IS
11			29	14:50	9.876	0.06978	0.04042			05-6391-7157	09-8035-0927	Wood E&IS
12	2022	Jul	26	16:00	8.89	-0.9158	-0.559			05-0315-2040	03-8123-7745	Wood E&IS
13		Nov	2	16:20	8.766	-1.04	-0.639			06-5398-2454	19-7795-7920	WSP Laboratory
14	2023	Mar	29	0:00	12.86	3.053	1.545			11-1983-2594	18-5493-4487	WSP Laboratory
15		Aug	16	15:15	11.42	1.617	0.87			10-1256-9161	01-6470-5988	WSP Laboratory
16			30	14:15	10.25	0.4464	0.2538			08-9311-6369	09-6947-9254	WSP Laboratory
17		Sep	6	13:40	11.13	1.327	0.7234			03-7157-8414	11-4706-8760	WSP Laboratory
18			14	14:40	12.33	2.519	1.304			00-4405-6464	14-6380-0834	WSP Laboratory
19			20	15:15	9.637	-0.1695	-0.09941			05-7969-2966	06-0084-3779	WSP Laboratory
20		Oct	4	14:45	11.51	1.701	0.9122			16-4139-2506	04-0955-6599	WSP Laboratory
21		Nov	7	14:30	11.22	1.415	0.7687			02-7880-1353	20-8736-7798	WSP Laboratory

Water Quality for Bivalve Development

Client: Internal
Project ID: NH₃ Reftox
Test No. 230914mgrdNH3

Test Species: *M. galloprovincialis*
Start Date/Time: 9/14/2023 1440
End Date/Time: 9/16/2023 1300

Concentration (mg/L)	Water Quality Measurements			
	Parameter	0hr	Ⓐ 24hr	Ⓐ 48hr
NH ₃ Lab Control (40.49)	Temp. (°C)	15.6	14.1	15.4
	Salinity (ppt)	31.7	32.3	31.7
	pH (units)	7.88	7.64	7.74
	DO (mg/L)	7.3	7.9	7.0
2 (40.49)	Temp. (°C)	16.0	14.1	15.1
	Salinity (ppt)	31.6	32.7	33.0 34.0
	pH (units)	7.89	7.62	7.73
	DO (mg/L)	7.5	8.0	7.5
4 (4.19)	Temp. (°C)	16.0	14.1	14.0
	Salinity (ppt)	31.8	33.6	35.2
	pH (units)	7.90	7.63	7.72
	DO (mg/L)	7.6	7.9	8.0
6 (5.25)	Temp. (°C)	16.0	14.0	13.9
	Salinity (ppt)	31.2	32.7	34.7
	pH (units)	7.90	7.61	7.72
	DO (mg/L)	7.7	8.1	8.1
8 (7.69)	Temp. (°C)	15.9	14.0	13.8
	Salinity (ppt)	31.3	33.3	35.2
	pH (units)	7.90	7.61	7.71
	DO (mg/L)	7.7	8.2	8.1
10 (8.91)	Temp. (°C)	15.8	14.0	13.8
	Salinity (ppt)	31.8 31.6	33.3	34.9
	pH (units)	7.88	7.61	7.71
	DO (mg/L)	7.7	8.2	8.1
20 (17.57)	Temp. (°C)	15.8	14.0	13.7
	Salinity (ppt)	31.3	33.4	35.7
	pH (units)	7.87	7.59	7.68
	DO (mg/L)	7.5	8.2	8.2
Tech Initials:		HK	KYB	JF

Source of Animals: MWC/Mission Bay

Date Received: 9/13/23

Comments: Ⓐ Limited volume in cups

QC Check: MF 12/11/23

Final Review: AG 12/26/23

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: *M. galloprovincialis*

Project ID: NH3 Reftox

Start Date: 9/12/2023- 1340 9/14/23 1440

Test No.: ~~230912 mg/dl NH3~~ ^{ML} 230914 mg/dl NH3

End Date: 9/14/2023 ~~1430~~^{Mk} 9/16/23 1300

DI Blank: 0.6

10 mg/L Ammonia Stock: 9.8

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N)

Comments:

0-50mg/L

QC Check: TF 1218123

Final Review: MK 12/20/23

Embryo-Larval Development Test Scoring Worksheet

Client: WSP PN Test Species: M. galloprovincialis
Project ID: RHMP-2023 #4 - Reference Toxicant Start Date: 9/14/2023 1440
Test No.: 230914 mg/L NH3 #4 End Date: 9/16/2023 1300

Random #	# Counted	# Normal	Tech Initials	Notes
1	313	291	BI	10/20/23
2	315	302		
3	292	276		
4	278	253		
5	322	302		
6	276	255		
7	324	304		
8	274	254		10/22/23
9	269	31		
10	294	261		
11	274	9		
12	296	278		
13	269	237		
14	298	265		
15	290	276		
16	315	285		
17	266	251		
18	310	274		
19	290	238		
20	316	283		
21	319	300		
22	256	2		
23	282	256		
24	271	245		
25	252	0		
26	293	255		
27	305	276		
28	287	257		
29	242	1		
30	305	278		
31	307	273		
32	279	268		10/25/23
33	274	256		
34	324	308		
35	269	256		
36				
37				
38				
39				
40				

QC Check: 12/11/23 MK

Final Review: MP AG 12/26/23

CETIS Test Data Worksheet

Report Date: 11 Sep-23 12:46 (p 1 of 1)
 Test Code/ID: 2A03F90 / 00-4405-6464

Bivalve Larval Survival and Development Test				WSP Laboratory	
Start Date:	14 Sep-23	Species:	Mytilus galloprovincialis	Sample Code:	17B600CA
End Date:	16 Sep-23	Protocol:	EPA/600/R-95/136 (1995)	Sample Source:	Reference Toxicant
Sample Date:	14 Sep-23	Material:	Total Ammonia	Sample Station:	

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
0	LC	1	8					
0	LC	2	12					
0	LC	3	17					
0	LC	4	34					
0	LC	5	15					
2		1	5					
2		2	10					
2		3	18					
2		4	21					
2		5	6					
4		1	24					
4		2	32					
4		3	33					
4		4	20					
4		5	30					
6		1	26					
6		2	7					
6		3	16					
6		4	23					
6		5	2					
8		1	3					
8		2	35					
8		3	1					
8		4	14					
8		5	27					
10		1	28					
10		2	4					
10		3	13					
10		4	19					
10		5	31					
20		1	9					
20		2	29					
20		3	11					
20		4	25					
20		5	22					

QC: JF

Unionized Ammonia Calculation for Pressure of 1 atm
Input 'Shaded' data

I	pK
1	9.26
2	9.27
3	9.28
4	9.29
5	9.30
6	9.32
7	9.33
8	9.34

Log Numb Beaker	Day	Dilution		Total Ammonia (mg/L)	Temp (C)	Salinity (ppt)	pH	Temp (K)	I	I Rounded	pK	Unionized Ammonia	D.O. (mg/L)	Beaker Num.	Station
230914mgrdNH3	0	0	<	0.00	15.60	31.70	7.88	288.76	7.02	7	9.33	0.000000		0	
230914mgrdNH3	0	2	<	0.49	16.00	31.60	7.89	289.16	7.00	7	9.33	0.009027		0	
230914mgrdNH3	0	4		4.15	16.00	31.80	7.90	289.16	7.05	7	9.33	0.078204		0	
230914mgrdNH3	0	6		5.25	16.00	31.20	7.90	289.16	6.92	7	9.33	0.098932		0	
230914mgrdNH3	0	8		7.69	15.90	31.30	7.90	289.06	6.94	7	9.33	0.143855		0	
230914mgrdNH3	0	10		8.91	15.80	31.60	7.88	288.96	7.00	7	9.33	0.158147		0	
230914mgrdNH3	0	20		17.57	15.80	31.30	7.87	288.96	6.94	7	9.33	0.304881		0	
230914mgrdNH3	2	0	<	0.00	15.40	31.70	7.74	288.56	7.02	7	9.33	0.000000		0	
230914mgrdNH3	2	2		1.95	15.10	34.00	7.73	288.26	7.52	8	9.34	0.022866		0	
230914mgrdNH3	2	4		3.54	14.00	35.20	7.72	287.16	7.77	8	9.34	0.037414		0	
230914mgrdNH3	2	6		5.00	13.90	34.70	7.72	287.06	7.66	8	9.34	0.052455		0	
230914mgrdNH3	2	8		6.83	13.80	35.20	7.71	286.96	7.77	8	9.34	0.069524		0	
230914mgrdNH3	2	10		8.78	13.80	34.90	7.71	286.96	7.71	8	9.34	0.089374		0	
230914mgrdNH3	2	20		15.74	13.70	35.70	7.68	286.86	7.88	8	9.34	0.148527		0	

Data Entered: MK 12/18/23

Data QC: MSK

Bivalve Reference Toxicant
48-hr Survival & Development
9/20/23

CETIS Summary Report

Report Date: 08 Apr-25 16:36 (p 1 of 2)
Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test

WSP Laboratory

Batch ID: 02-4166-8725	Test Type: Development-Survival	Analyst:
Start Date: 20 Sep-23 15:15	Protocol: EPA/600/R-95/136 (1995)	Diluent: Diluted Natural Seawater
Ending Date: 22 Sep-23 14:00	Species: Mytilis galloprovincialis	Brine: Not Applicable
Test Length: 47h	Taxon:	Source: Field Collected
		Age:
Sample ID: 10-3751-2012	Code: 230920mgrdNH3	Project:
Sample Date: 20 Sep-23	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 20 Sep-23	CAS (PC):	Station: In House
Sample Age: 15h	Client: Internal	

Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	NOEL	LOEL	TOEL	PMSD
16-8086-4781	Combined Proportion Normal	Steel Many-One Rank Sum Test	5.97	7.23	6.57	8.01%
17-8522-2501	Proportion Normal	Steel Many-One Rank Sum Test	<1.63	1.63	---	6.5%
19-6831-7728	Survival Rate	Steel Many-One Rank Sum Test	16.42	>16.42	---	6.81%

Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	Level	mg/L	95% LCL	95% UCL
08-8180-8478	Combined Proportion Normal	Trimmed Spearman-Kärber	EC50	9.637	9.497	9.778

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
17-8522-2501	Proportion Normal	Control Resp	0.9181	0.9	>>	Yes	Passes Criteria
19-6831-7728	Survival Rate	Control Resp	0.9633	0.5	>>	Yes	Passes Criteria
16-8086-4781	Combined Proportion Normal	PMSD	0.08009	<<	0.25	No	Passes Criteria

Combined Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	0.8843	0.8418	0.9269	0.8458	0.9258	0.0153	0.0343	3.88%	0.00%
1.63		5	0.8442	0.8139	0.8745	0.8125	0.8708	0.0109	0.0244	2.89%	4.54%
3.07		5	0.8514	0.7886	0.9142	0.7875	0.9042	0.0226	0.0506	5.94%	3.73%
4.48		5	0.8319	0.7770	0.8867	0.7708	0.8843	0.0197	0.0441	5.31%	5.93%
5.97		5	0.8561	0.8356	0.8767	0.8308	0.8702	0.0074	0.0165	1.93%	3.19%
7.23		5	0.6844	0.5279	0.8408	0.4802	0.8042	0.0564	0.1260	18.42%	22.61%
16.42		5	0.0033	-0.0010	0.0076	0.0000	0.0083	0.0016	0.0035	105.44%	99.63%

Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	0.9181	0.9095	0.9267	0.9084	0.9258	0.0031	0.0069	0.75%	0.00%
1.63		5	0.8826	0.8695	0.8958	0.8745	0.9009	0.0047	0.0106	1.20%	3.86%
3.07		5	0.8752	0.8464	0.9040	0.8398	0.9042	0.0104	0.0232	2.65%	4.67%
4.48		5	0.8668	0.8466	0.8871	0.8447	0.8843	0.0073	0.0163	1.89%	5.58%
5.97		5	0.8561	0.8356	0.8767	0.8308	0.8702	0.0074	0.0165	1.93%	6.75%
7.23		5	0.7297	0.5508	0.9086	0.4802	0.8319	0.0644	0.1441	19.74%	20.52%
16.42		5	0.0034	-0.0011	0.0079	0.0000	0.0087	0.0016	0.0036	107.28%	99.63%

Survival Rate Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	LC	5	0.9633	0.9149	1.0120	0.9167	1.0000	0.0175	0.0390	4.05%	0.00%
1.63		5	0.9567	0.9138	0.9996	0.9208	0.9958	0.0155	0.0346	3.61%	0.69%
3.07		5	0.9725	0.9183	1.0270	0.9000	1.0000	0.0195	0.0437	4.49%	-0.95%
4.48		5	0.9592	0.9171	1.0010	0.9125	1.0000	0.0152	0.0339	3.53%	0.43%
5.97		5	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-3.81%
7.23		5	0.9425	0.8723	1.0130	0.8667	1.0000	0.0253	0.0566	6.00%	2.16%
16.42		5	0.9808	0.9482	1.0130	0.9500	1.0000	0.0118	0.0263	2.68%	-1.82%

CETIS Summary Report

Report Date: 08 Apr-25 16:36 (p 2 of 2)
 Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test

WSP Laboratory

Combined Proportion Normal Detail

MD5: 1520682817DC099A9FE21523ABEA3008

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	0.8458	0.8875	0.9084	0.9258	0.8542
1.63		0.8708	0.8375	0.8667	0.8125	0.8333
3.07		0.8740	0.8828	0.9042	0.7875	0.8083
4.48		0.7708	0.8625	0.8843	0.8125	0.8292
5.97		0.8702	0.8485	0.8623	0.8687	0.8308
7.23		0.6542	0.8042	0.4802	0.7417	0.7417
16.42		0.0040	0.0083	0.0000	0.0041	0.0000

Proportion Normal Detail

MD5: 37E541293B69EB4B22BFA2216E9B9D81

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	0.9227	0.9142	0.9084	0.9258	0.9193
1.63		0.8745	0.8777	0.8776	0.8824	0.9009
3.07		0.8740	0.8828	0.9042	0.8750	0.8398
4.48		0.8447	0.8771	0.8843	0.8553	0.8728
5.97		0.8702	0.8485	0.8623	0.8687	0.8308
7.23		0.7548	0.8319	0.4802	0.7574	0.8241
16.42		0.0040	0.0087	0.0000	0.0041	0.0000

Survival Rate Detail

MD5: 2FC551C53063091251DC9AB0CE857D31

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	LC	0.9167	0.9708	1.0000	1.0000	0.9292
1.63		0.9958	0.9542	0.9875	0.9208	0.9250
3.07		1.0000	1.0000	1.0000	0.9000	0.9625
4.48		0.9125	0.9833	1.0000	0.9500	0.9500
5.97		1.0000	1.0000	1.0000	1.0000	1.0000
7.23		0.8667	0.9667	1.0000	0.9792	0.9000
16.42		1.0000	0.9542	0.9500	1.0000	1.0000

CETIS Analytical Report

Report Date: 08 Apr-25 16:36 (p 1 of 6)
Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test										WSP Laboratory	
Analysis ID: 16-8086-4781		Endpoint: Combined Proportion Normal				CETIS Version: CETIS v2.1.5					
Analyzed: 08 Apr-25 16:35		Analysis: Nonparametric-Control vs Treatments				Status Level: 1					
Edit Date: 08 Apr-25 0:00		MD5 Hash: 1520682817DC099A9FE21523ABEA3008				Editor ID: 002-883-387-8					
Batch ID: 02-4166-8725		Test Type: Development-Survival				Analyst:					
Start Date: 20 Sep-23 15:15		Protocol: EPA/600/R-95/136 (1995)				Diluent: Diluted Natural Seawater					
Ending Date: 22 Sep-23 14:00		Species: Mytilis galloprovincialis				Brine: Not Applicable					
Test Length: 47h		Taxon:				Source: Field Collected		Age:			
Sample ID: 10-3751-2012		Code: 230920mgrdNH3				Project:					
Sample Date: 20 Sep-23		Material: Total Ammonia				Source: Reference Toxicant					
Receipt Date: 20 Sep-23		CAS (PC):				Station: In House					
Sample Age: 15h		Client: Internal									
Data Transform		Alt Hyp				NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD
Angular (Corrected)		C > T				5.97	7.23	6.57	—	0.07083	8.01%
Steel Many-One Rank Sum Test											
Control	vs	Conc-mg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Lab Control		1.63	8	19	16	0	CDF	0.1478	Non-Significant Effect		
		3.07	8	22	16	0	CDF	0.3786	Non-Significant Effect		
		4.48	8	19	16	0	CDF	0.1478	Non-Significant Effect		
		5.97	8	22	16	0	CDF	0.3786	Non-Significant Effect		
		7.23*	8	15	16	0	CDF	0.0222	Significant Effect		
		16.42*	8	15	16	0	CDF	0.0222	Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	5.28391		0.880652		6	194.8	<1.0E-05	Significant Effect			
Error	0.126614		0.0045219		28						
Total	5.41052				34						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Bartlett Equality of Variance Test				17.08	16.81	0.0090	Unequal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.9371	0.9146	0.0458	Normal Distribution			
Combined Proportion Normal Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	0.8843	0.8418	0.9269	0.8875	0.8458	0.9258	0.0153	3.88%	0.00%
1.63		5	0.8442	0.8139	0.8745	0.8375	0.8125	0.8708	0.0109	2.89%	4.54%
3.07		5	0.8514	0.7886	0.9142	0.8740	0.7875	0.9042	0.0226	5.94%	3.73%
4.48		5	0.8319	0.7770	0.8867	0.8292	0.7708	0.8843	0.0197	5.31%	5.93%
5.97		5	0.8561	0.8356	0.8767	0.8623	0.8308	0.8702	0.0074	1.93%	3.19%
7.23		5	0.6844	0.5279	0.8408	0.7417	0.4802	0.8042	0.0564	18.42%	22.61%
16.42		5	0.0033	0.0000	0.0076	0.0040	0.0000	0.0083	0.0016	105.44%	99.63%
Angular (Corrected) Transformed Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	1.2270	1.1590	1.2940	1.2290	1.1670	1.2950	0.0243	4.43%	0.00%
1.63		5	1.1660	1.1240	1.2080	1.1560	1.1230	1.2030	0.0151	2.89%	4.95%
3.07		5	1.1790	1.0910	1.2670	1.2080	1.0920	1.2560	0.0316	5.99%	3.89%
4.48		5	1.1510	1.0770	1.2240	1.1450	1.0720	1.2240	0.0265	5.14%	6.18%
5.97		5	1.1820	1.1530	1.2110	1.1910	1.1470	1.2020	0.0104	1.97%	3.62%
7.23		5	0.9791	0.8130	1.1450	1.0380	0.7656	1.1120	0.0598	13.66%	20.18%
16.42		5	0.0566	0.0253	0.0879	0.0637	0.0315	0.0914	0.0113	44.52%	95.39%

CETIS Analytical Report

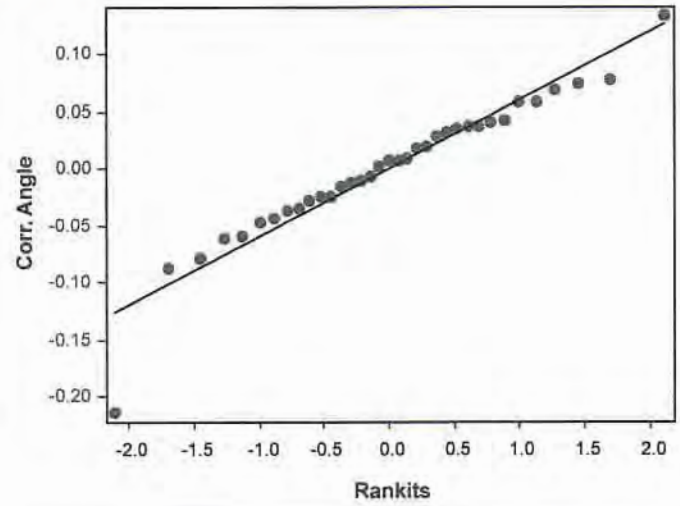
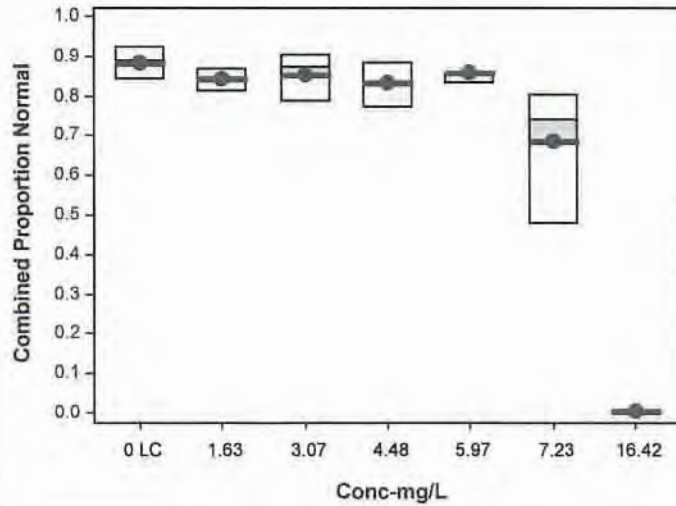
Report Date: 08 Apr-25 16:36 (p 2 of 6)
Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 16-8086-4781	Endpoint: Combined Proportion Normal	CETIS Version: CETIS v2.1.5
Analyzed: 08 Apr-25 16:35	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 08 Apr-25 0:00	MD5 Hash: 1520682817DC099A9FE21523ABEA3008	Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

Report Date: 08 Apr-25 16:36 (p 3 of 6)
Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test										WSP Laboratory	
Analysis ID: 17-8522-2501			Endpoint: Proportion Normal				CETIS Version: CETIS v2.1.5				
Analyzed: 08 Apr-25 16:35			Analysis: Nonparametric-Control vs Treatments				Status Level: 1				
Edit Date: 08 Apr-25 0:00			MD5 Hash: 37E541293B69EB4B22BFA2216E9B9D81				Editor ID: 002-883-387-8				
Batch ID: 02-4166-8725			Test Type: Development-Survival				Analyst:				
Start Date: 20 Sep-23 15:15			Protocol: EPA/600/R-95/136 (1995)				Diluent: Diluted Natural Seawater				
Ending Date: 22 Sep-23 14:00			Species: Mytilis galloprovincialis				Brine: Not Applicable				
Test Length: 47h			Taxon:				Source: Field Collected		Age:		
Sample ID: 10-3751-2012			Code: 230920mgrdNH3				Project:				
Sample Date: 20 Sep-23			Material: Total Ammonia				Source: Reference Toxicant				
Receipt Date: 20 Sep-23			CAS (PC):				Station: In House				
Sample Age: 15h			Client: Internal								
Data Transform		Alt Hyp			NOEL	LOEL	TOEL	Tox Units	MSDu	PMSD	
Angular (Corrected)		C > T			<1.63	1.63	---	---	0.05963	6.50%	
Steel Many-One Rank Sum Test											
Control	vs	Conc-mg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Lab Control		1.63*	8	15	16	0	CDF	0.0222	Significant Effect		
		3.07*	8	15	16	0	CDF	0.0222	Significant Effect		
		4.48*	8	15	16	0	CDF	0.0222	Significant Effect		
		5.97*	8	15	16	0	CDF	0.0222	Significant Effect		
		7.23*	8	15	16	0	CDF	0.0222	Significant Effect		
		16.42*	8	15	16	0	CDF	0.0222	Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	5.64857		0.941428		6	238.6	<1.0E-05	Significant Effect			
Error	0.110488		0.0039460		28						
Total	5.75906				34						
ANOVA Assumptions Tests											
Attribute	Test				Test Stat	Critical	P-Value	Decision(α:1%)			
Variance	Bartlett Equality of Variance Test				39.87	16.81	<1.0E-05	Unequal Variances			
Distribution	Shapiro-Wilk W Normality Test				0.6843	0.9146	<1.0E-05	Non-Normal Distribution			
Proportion Normal Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	0.9181	0.9095	0.9267	0.9193	0.9084	0.9258	0.0031	0.75%	0.00%
1.63		5	0.8826	0.8695	0.8958	0.8777	0.8745	0.9009	0.0047	1.20%	3.86%
3.07		5	0.8752	0.8464	0.9040	0.8750	0.8398	0.9042	0.0104	2.65%	4.67%
4.48		5	0.8668	0.8466	0.8871	0.8728	0.8447	0.8843	0.0073	1.89%	5.58%
5.97		5	0.8561	0.8356	0.8767	0.8623	0.8308	0.8702	0.0074	1.93%	6.75%
7.23		5	0.7297	0.5508	0.9086	0.7574	0.4802	0.8319	0.0644	19.74%	20.52%
16.42		5	0.0034	0.0000	0.0079	0.0040	0.0000	0.0087	0.0016	107.28%	99.63%
Angular (Corrected) Transformed Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	1.2810	1.2650	1.2960	1.2830	1.2630	1.2950	0.0056	0.98%	0.00%
1.63		5	1.2210	1.2000	1.2420	1.2140	1.2090	1.2510	0.0075	1.38%	4.63%
3.07		5	1.2110	1.1680	1.2540	1.2090	1.1590	1.2560	0.0156	2.88%	5.46%
4.48		5	1.1980	1.1680	1.2270	1.2060	1.1660	1.2240	0.0107	2.00%	6.47%
5.97		5	1.1820	1.1530	1.2110	1.1910	1.1470	1.2020	0.0104	1.97%	7.69%
7.23		5	1.0320	0.8390	1.2250	1.0560	0.7656	1.1480	0.0696	15.07%	19.41%
16.42		5	0.0572	0.0252	0.0892	0.0637	0.0315	0.0936	0.0115	45.04%	95.53%

CETIS Analytical Report

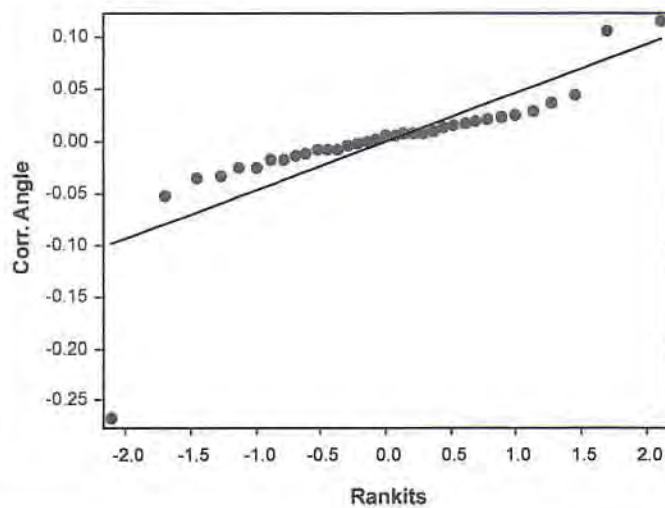
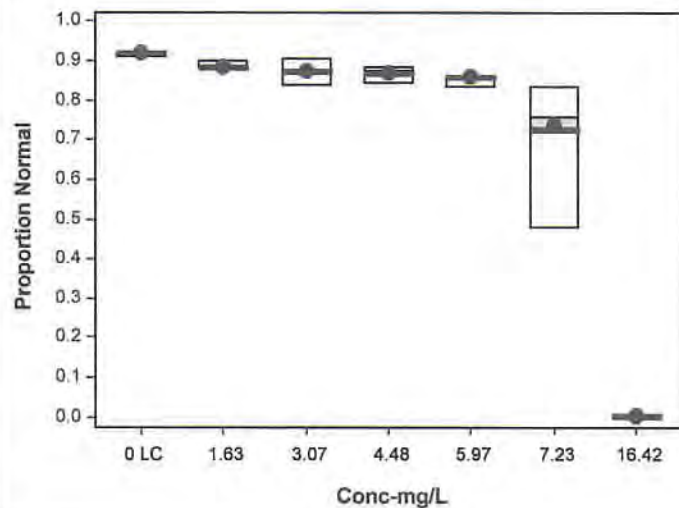
Report Date: 08 Apr-25 16:36 (p 4 of 6)
Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 17-8522-2501	Endpoint: Proportion Normal	CETIS Version: CETIS v2.1.5
Analyzed: 08 Apr-25 16:35	Analysis: Nonparametric-Control vs Treatments	Status Level: 1
Edit Date: 08 Apr-25 0:00	MD5 Hash: 37E541293B69EB4B22BFA2216E9B9D81	Editor ID: 002-883-387-8

Graphics



CETIS Analytical Report

 Report Date: 08 Apr-25 16:36 (p 5 of 6)
 Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test								WSP Laboratory			
Analysis ID: 19-6831-7728		Endpoint: Survival Rate		CETIS Version: CETIS v2.1.5							
Analyzed: 08 Apr-25 16:35		Analysis: Nonparametric-Control vs Treatments		Status Level: 1							
Edit Date: 08 Apr-25 0:00		MD5 Hash: 2FC551C53063091251DC9AB0CE857D31		Editor ID: 002-883-387-8							
Batch ID: 02-4166-8725		Test Type: Development-Survival		Analyst:							
Start Date: 20 Sep-23 15:15		Protocol: EPA/600/R-95/136 (1995)		Diluent: Diluted Natural Seawater							
Ending Date: 22 Sep-23 14:00		Species: Mytilus galloprovincialis		Brine: Not Applicable							
Test Length: 47h		Taxon:		Source: Field Collected						Age:	
Sample ID: 10-3751-2012		Code: 230920mgrdNH3		Project:							
Sample Date: 20 Sep-23		Material: Total Ammonia		Source: Reference Toxicant							
Receipt Date: 20 Sep-23		CAS (PC):		Station: In House							
Sample Age: 15h		Client: Internal									
Data Transform		Alt Hyp		NOEL		LOEL		TOEL		Tox Units MSDu PMSD	
Angular (Corrected)		C > T		16.42		>16.42		---		0.06563 6.81%	
Steel Many-One Rank Sum Test											
Control	vs	Conc-mg/L	df	Test Stat	Critical	Ties	P-Type	P-Value	Decision(α:5%)		
Lab Control		1.63	8	25	16	0	CDF	0.6693	Non-Significant Effect		
		3.07	8	29	16	2	CDF	0.9262	Non-Significant Effect		
		4.48	8	26	16	2	CDF	0.7547	Non-Significant Effect		
		5.97	8	35	16	2	CDF	0.9986	Non-Significant Effect		
		7.23	8	24	16	2	CDF	0.5746	Non-Significant Effect		
		16.42	8	31	16	2	CDF	0.9749	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.113638		0.0189398		6	1.596	0.1853	Non-Significant Effect			
Error	0.332311		0.0118682		28						
Total	0.445949				34						
ANOVA Assumptions Tests											
Attribute	Test		Test Stat		Critical	P-Value	Decision(α:1%)				
Variance	Bartlett Equality of Variance Test						Indeterminate				
Distribution	Shapiro-Wilk W Normality Test		0.9634		0.9146	0.2881	Normal Distribution				
Survival Rate Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	0.9633	0.9149	1.0000	0.9708	0.9167	1.0000	0.0175	4.05%	0.00%
1.63		5	0.9567	0.9138	0.9996	0.9542	0.9208	0.9958	0.0155	3.61%	0.69%
3.07		5	0.9725	0.9183	1.0000	1.0000	0.9000	1.0000	0.0195	4.49%	-0.95%
4.48		5	0.9592	0.9171	1.0000	0.9500	0.9125	1.0000	0.0152	3.53%	0.43%
5.97		5	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-3.81%
7.23		5	0.9425	0.8723	1.0000	0.9667	0.8667	1.0000	0.0253	6.00%	2.16%
16.42		5	0.9808	0.9482	1.0000	1.0000	0.9500	1.0000	0.0118	2.68%	-1.82%
Angular (Corrected) Transformed Summary											
Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	LC	5	1.4110	1.2560	1.5660	1.3990	1.2780	1.5390	0.0558	8.85%	0.00%
1.63		5	1.3800	1.2570	1.5030	1.3550	1.2860	1.5060	0.0443	7.17%	2.22%
3.07		5	1.4480	1.2850	1.6120	1.5390	1.2490	1.5390	0.0589	9.09%	-2.62%
4.48		5	1.3880	1.2600	1.5170	1.3450	1.2700	1.5390	0.0463	7.47%	1.62%
5.97		5	1.5390	1.5390	1.5390	1.5390	1.5390	1.5390	0.0000	0.00%	-9.03%
7.23		5	1.3600	1.1890	1.5310	1.3870	1.1970	1.5390	0.0616	10.13%	3.65%
16.42		5	1.4630	1.3350	1.5910	1.5390	1.3450	1.5390	0.0462	7.05%	-3.69%

CETIS Analytical Report

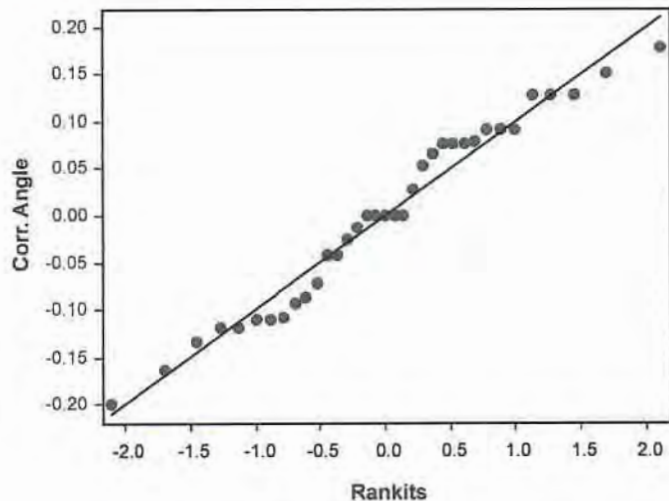
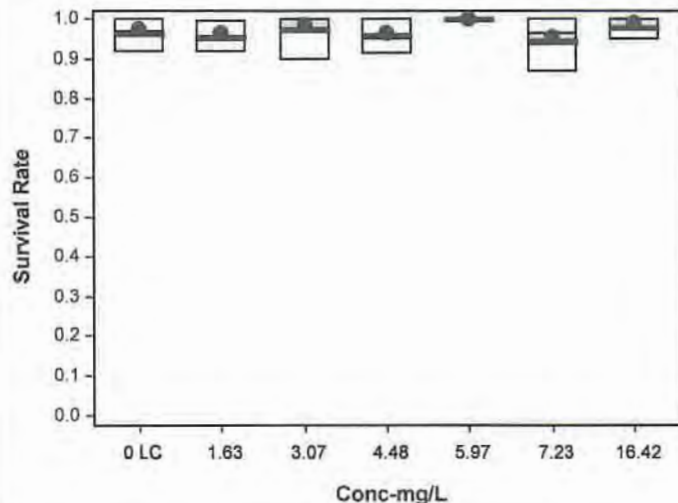
Report Date: 08 Apr-25 16:36 (p 6 of 6)
Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test

WSP Laboratory

Analysis ID: 19-6831-7728 Endpoint: Survival Rate CETIS Version: CETIS v2.1.5
Analyzed: 08 Apr-25 16:35 Analysis: Nonparametric-Control vs Treatments Status Level: 1
Edit Date: 08 Apr-25 0:00 MD5 Hash: 2FC551C53063091251DC9AB0CE857D31 Editor ID: 002-883-387-8

Graphics



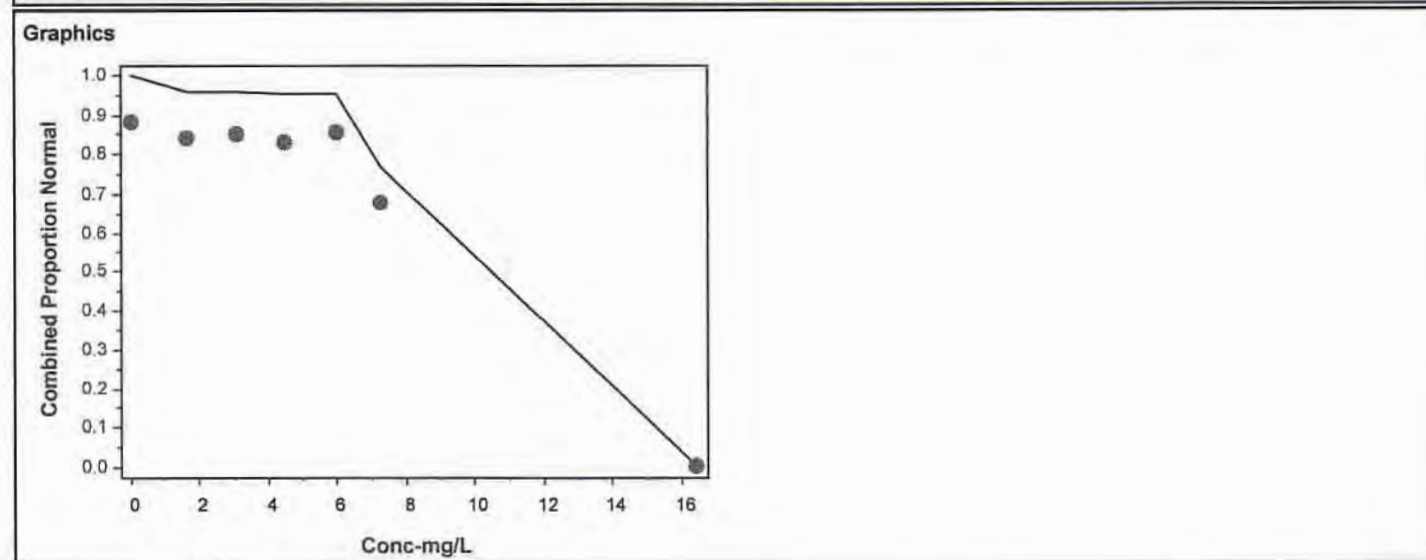
CETIS Analytical Report

Report Date: 08 Apr-25 16:36 (p 1 of 1)
Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test				WSP Laboratory	
Analysis ID:	08-8180-8478	Endpoint:	Combined Proportion Normal	CETIS Version:	CETIS v2.1.5
Analyzed:	08 Apr-25 16:35	Analysis:	Trimmed Spearman-Kärber	Status Level:	1
Edit Date:	08 Apr-25 0:00	MD5 Hash:	1520682817DC099A9FE21523ABEA3008	Editor ID:	002-883-387-8
Batch ID:	02-4166-8725	Test Type:	Development-Survival	Analyst:	
Start Date:	20 Sep-23 15:15	Protocol:	EPA/600/R-95/136 (1995)	Diluent:	Diluted Natural Seawater
Ending Date:	22 Sep-23 14:00	Species:	Mytilis galloprovincialis	Brine:	Not Applicable
Test Length:	47h	Taxon:		Source:	Field Collected
Sample ID:	10-3751-2012	Code:	230920mgrdNH3	Project:	
Sample Date:	20 Sep-23	Material:	Total Ammonia	Source:	Reference Toxicant
Receipt Date:	20 Sep-23	CAS (PC):		Station:	In House
Sample Age:	15h	Client:	Internal		

Trimmed Spearman-Kärber Estimates							
Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.1149	4.12%	0.9839	0.003165	9.637	9.497	9.778

Combined Proportion Normal Summary				Calculated Variate(A/B)					Isotonic Variate		
Conc-mg/L	Code	Count	Mean	Median	Min	Max	CV%	%Effect	ΣA/ΣB	Mean	%Effect
0	LC	5	0.8843	0.8875	0.8458	0.9258	3.88%	0.00%	1086/1227	0.8843	0.00%
1.63		5	0.8442	0.8375	0.8125	0.8708	2.89%	4.54%	1013/1200	0.8478	4.13%
3.07		5	0.8514	0.8740	0.7875	0.9042	5.94%	3.73%	1074/1259	0.8478	4.13%
4.48		5	0.8319	0.8292	0.7708	0.8843	5.31%	5.93%	1000/1202	0.8440	4.56%
5.97		5	0.8561	0.8623	0.8308	0.8702	1.93%	3.19%	1111/1298	0.8440	4.56%
7.23		5	0.6844	0.7417	0.4802	0.8042	18.42%	22.61%	827/1212	0.6844	22.61%
16.42		5	0.0033	0.0040	0.0000	0.0083	105.44%	99.63%	4/1223	0.0033	99.63%



Bivalve Larval Survival and Development Test

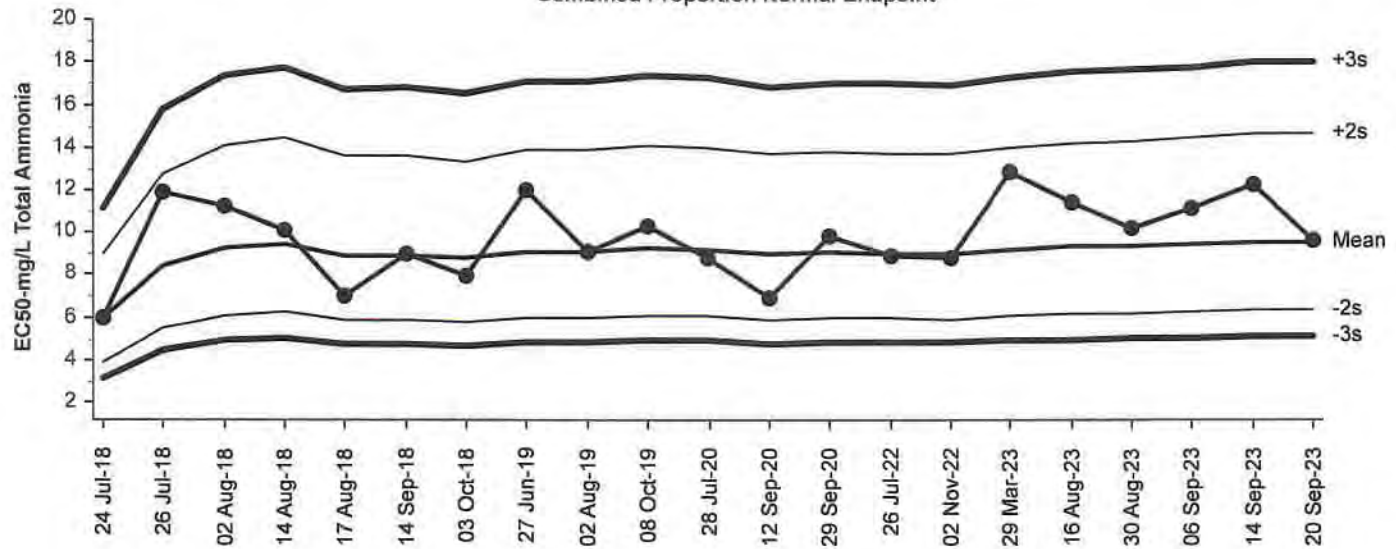
All Matching Labs

Test Type: Development-Survival
Protocol: EPA/600/R-95/136 (1995)

Organism: *Mytilus galloprovincialis*
Endpoint: Combined Proportion Normal

Material: Total Ammonia
Source: Reference Toxicant-REF

Bivalve Larval Survival and Development Test
Combined Proportion Normal Endpoint



Lognormal Cumulative Mean Plot

Mean: 9.593 Count: 20 -2s Warning Limit: 6.3 -3s Action Limit: 5.1
Sigma: NA CV: 21.30% +2s Warning Limit: 14.6 +3s Action Limit: 18

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2018	Jul	24	0:00	5.919	-3.673	-2.295	(-)		06-2214-9289	19-4459-2946	Aquatic Bioassay & Consu
2			26	15:30	11.91	2.321	1.03			04-4750-3360	07-2492-6358	Wood E&IS
3		Aug	2	14:15	11.26	1.671	0.763			15-4398-7435	08-1276-4615	Wood E&IS
4			14	14:15	10.09	0.4946	0.2389			06-7156-7887	14-6273-7305	Wood E&IS
5			17	17:15	6.994	-2.599	-1.502			03-5411-9632	11-7669-9942	Wood E&IS
6		Sep	14	15:00	9.017	-0.5756	-0.2941			17-8327-4430	05-1718-6773	Wood E&IS
7		Oct	3	15:20	7.902	-1.691	-0.9214			17-8768-6287	19-9418-2380	Wood E&IS
8	2019	Jun	27	15:45	11.99	2.395	1.059			05-1883-7419	17-3403-8072	Wood E&IS
9		Aug	2	0:00	9.077	-0.5157	-0.2626			03-9120-6967	06-1839-4155	Wood E&IS
10		Oct	8	15:30	10.29	0.6947	0.3323			17-9246-6483	01-1723-7825	Wood E&IS
11	2020	Jul	28	17:00	8.755	-0.8372	-0.434			09-5299-4651	16-9371-3551	Wood E&IS
12		Sep	12	18:15	6.938	-2.655	-1.54			02-4404-7341	15-1829-1450	Wood E&IS
13			29	14:50	9.876	0.2832	0.1383			05-6391-7157	09-8035-0927	Wood E&IS
14	2022	Jul	26	16:00	8.89	-0.7024	-0.3614			05-0315-2040	03-8123-7745	Wood E&IS
15		Nov	2	16:20	8.766	-0.8263	-0.4281			06-5398-2454	19-7795-7920	WSP Laboratory
16	2023	Mar	29	0:00	12.86	3.266	1.393			11-1983-2594	18-5493-4487	WSP Laboratory
17		Aug	16	15:15	11.42	1.83	0.8298			10-1256-9161	01-6470-5988	WSP Laboratory
18			30	14:15	10.25	0.6598	0.3162			08-9311-6369	09-6947-9254	WSP Laboratory
19		Sep	6	13:40	11.13	1.54	0.7076			03-7157-8414	11-4706-8760	WSP Laboratory
20			14	14:40	12.33	2.732	1.191			00-4405-6464	14-6380-0834	WSP Laboratory
21			20	15:15	9.637	0.04388	0.02169			05-7969-2966	06-0084-3779	WSP Laboratory

Water Quality for Bivalve Development

Client: Internal
Project ID: NH₃ Reftox
Test No. 230920mgrdNH3

Test Species: *M. galloprovincialis*
Start Date/Time: 9/20/2023 1515
End Date/Time: 9/22/2023 1400

Concentration (mg/L)	Water Quality Measurements			
	Parameter	0hr	24hr	48hr
Lab Control	Temp. (°C)	15.4	14.0	14.3
	Salinity (ppt)	31.5	32.4	33.4
	pH (units)	7.81	7.40	7.56
	DO (mg/L)	7.5	8.0	8.0
2	Temp. (°C)	15.0	14.0	14.3
	Salinity (ppt)	31.4	33.1	36.0
	pH (units)	7.78	7.52	7.65
	DO (mg/L)	7.5	8.1	8.0
4	Temp. (°C)	14.9	13.9	14.3
	Salinity (ppt)	31.7	34.2	36.1
	pH (units)	7.76	7.54	7.66
	DO (mg/L)	7.5	8.1	8.1
6	Temp. (°C)	15.2	13.6	14.4
	Salinity (ppt)	31.7	34.3	36.2
	pH (units)	7.77	7.55	7.65
	DO (mg/L)	7.5	8.1	8.1
8	Temp. (°C)	15.4	13.6	14.8
	Salinity (ppt)	31.5	33.7	37.0
	pH (units)	7.78	7.56	7.63
	DO (mg/L)	7.5	8.1	8.1
10	Temp. (°C)	15.7	13.7	15.0
	Salinity (ppt)	31.7	33.7	36.3
	pH (units)	7.77	7.56	7.64
	DO (mg/L)	7.5	8.1	8.1
20	Temp. (°C)	15.8	13.4	15.1
	Salinity (ppt)	31.5	34.3	36.2
	pH (units)	7.75	7.54	7.62
	DO (mg/L)	7.5	8.1	8.2
Tech Initials:		AG	RN	JP

Source of Animals: NWY/Mission Bay

Date Received: 9/19/23

Comments:

QC Check: JP 12/15/23

Final Review: AG 12/27/23

CETIS Test Data Worksheet

Report Date: 18 Sep-23 15:10 (p 1 of 1)

Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test

WSP Laboratory

Start Date: 20 Sep-23 1515
End Date: 22 Sep-23 1400
Sample Date: 20 Sep-23

Species: Mytilis galloprovincialis
Protocol: EPA/600/R-95/136 (1995)
Material: Total Ammonia

Sample Code: 230920mgrdNH3
Sample Source: Reference Toxicant
Sample Station:

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
0	LC	1	1					
0	LC	2	13					
0	LC	3	7					
0	LC	4	3					
0	LC	5	11					
2		1	35					
2		2	22					
2		3	16					
2		4	21					
2		5	15					
4		1	23					
4		2	28					
4		3	30					
4		4	10					
4		5	17					
6		1	18					
6		2	27					
6		3	6					
6		4	4					
6		5	26					
8		1	5					
8		2	29					
8		3	31					
8		4	2					
8		5	24					
10		1	32					
10		2	8					
10		3	12					
10		4	25					
10		5	34					
20		1	19					
20		2	9					
20		3	14					
20		4	33					
20		5	20					

QC: JF

CETIS Test Data Worksheet

Report Date: 18 Sep-23 15:10 (p 1 of 1)

Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test

WSP Laboratory

Start Date: 20 Sep-23 1515 Species: Mytilus galloprovincialis
 End Date: 22 Sep-23 1400 Protocol: EPA/600/R-95/136 (1995)
 Sample Date: 20 Sep-23 Material: Total Ammonia

Sample Code: 230920mgrdNH3
 Sample Source: Reference Toxicant
 Sample Station:

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
			1			220	203	
			2			259	225	
			3			256	237	
			4			228	195	
			5			262	228	
			6			242	214	
			7			251	228	
			8			232	193	
			9			229	2	
			10			216	189	
			11			223	205	
			12			252	212	
			13			233	213	
			14			228	0	
			15			222	200	
			16			237	208	
			17			231	194	
			18			219	185	
			19			247	1	
			20			252	0	
			21			221	195	
			22			229	201	
			23			262	229	
			24			266	221	
			25			235	178	
			26			228	199	
			27			236	207	
			28			256	226	
			29			264	224	
			30			261	236	
			31			247	213	
			32			208	157	
			33			244	1	
			34			216	178	
			35			239	209	

CETIS Test Data Worksheet

Report Date: 18 Sep-23 15:10 (p 1 of 1)
 Test Code/ID: 230920mgrdNH3 / 05-7969-2966

Bivalve Larval Survival and Development Test					WSP Laboratory				
Start Date: 20 Sep-23		Species: Mytilis galloprovincialis			Sample Code: 230920mgrdNH3				
End Date: 22 Sep-23		Protocol: EPA/600/R-95/136 (1995)			Sample Source: Reference Toxicant				
Sample Date: 20 Sep-23		Material: Total Ammonia			Sample Station:				
Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes	
0	LC	1	1						
0	LC	2	13						
0	LC	3	7						
0	LC	4	3						
0	LC	5	11						
2		1	35						
2		2	22						
2		3	16						
2		4	21						
2		5	15						
4		1	23						
4		2	28						
4		3	30						
4		4	10						
4		5	17						
6		1	18						
6		2	27						
6		3	6						
6		4	4						
6		5	26						
8		1	5						
8		2	29						
8		3	31						
8		4	2						
8		5	24						
10		1	32						
10		2	8						
10		3	12						
10		4	25						
10		5	34						
20		1	19						
20		2	9						
20		3	14						
20		4	33						
20		5	20						

Ammonia Subsample Analysis - Overlying Water

Client: WSP

Test Species: *M. galloprovincialis*

Project ID: NH3 Reftox

Start Date: 9/20/2023

Test No.: 230920mgrdNH3

End Date: 9/22/2023

DI Blank: 0-0

10 mg/L Ammonia Stock: 9.92

[illegible]

Note: The meter detection limit for ammonia is 0.4 mg/L (as N) 1 - 12

Comments:

QC Check: JS-12115123

Final Review:

Unionized Ammonia Calculation for Pressure of 1 atm

Input 'Shaded' data

I	pK
1	9.26
2	9.27
3	9.28
4	9.29
5	9.3
6	9.32
7	9.33
8	9.34

Log Numb	Beaker	Day	Dilution		Total Amm	Temp (C)	Salinity (ppt)	pH	Temp (K)	I	IRounded	pK	Unionized Amr	D.O. (mg/L)	Beaker Nu	Station
230920mgrdNH3		0	0	<	0	15.4	31.5	7.81	288.56	6.982353	7	9.33	0		0	
230920mgrdNH3		0	2		1.63	15	31.4	7.78	288.16	6.961104	7	9.33	0.021746753		0	
230920mgrdNH3		0	4		3.07	14.9	31.6	7.76	288.06	7.003607	7	9.33	0.038851443		0	
230920mgrdNH3		0	6		4.48	15.2	31.6	7.77	288.36	7.003607	7	9.33	0.05929413		0	
230920mgrdNH3		0	8		5.97	15.4	31.5	7.78	288.56	6.982353	7	9.33	0.082028707		0	
230920mgrdNH3		0	10		7.23	15.7	31.7	7.77	288.86	7.024866	7	9.33	0.099278184		0	
230920mgrdNH3		0	20		16.42	15.8	31.5	7.75	288.96	6.982353	7	9.33	0.217047378		0	
230920mgrdNH3		2	0	<	0	14.3	33.4	7.56	287.46	7.386936	7	9.33	0		0	
230920mgrdNH3		2	2		1.78	14.3	36	7.65	287.46	7.943173	8	9.34	0.016396853		0	
230920mgrdNH3		2	4		3.2	14.3	36.1	7.66	287.46	7.964627	8	9.34	0.030157636		0	
230920mgrdNH3		2	6		4.59	14.4	36.2	7.65	287.56	7.986085	8	9.34	0.042595456		0	
230920mgrdNH3		2	8		5.9	14.8	37	7.63	287.96	8.157914	8	9.34	0.053880003		0	
230920mgrdNH3		2	10		7.41	15	36.3	7.64	288.16	8.007548	8	9.34	0.070262005		0	
230920mgrdNH3		2	20		14.32	15.1	36.2	7.62	288.26	7.986085	8	9.34	0.130689687		0	

Data Entered: JF

Data QC: AG 12/27/23