



31 October 2023

---

## **GHHP QA/QC assessment of the 2023 water and sediment quality data**

**Purpose:** To identify potential QA/QC issues from the 2023 reporting year.

**Prepared by:** Research Officer and ISP Chair

---

# Table of Contents

1. Summary of GHHP QA/QC assessment of the water quality and sediment quality data from the 2023 reporting year .....	3
Table 1.1. Dissolved metals cases where the filtered values were higher than the total values. Relative percent difference (RPD) is also shown.....	4
Table 1.2. Positive field blank (FB) and travel blank (TB) samples.....	5
Table 1.3. Duplicate sample concentrations greater than 10 times the limit of reporting value, with a relative percent difference (RPD) greater than 50% of the main sample concentration. ....	6
Table 1.4. Limit of reporting values for the 2023 reporting year. ....	7
2. GHHP reported measures only - Summary of QA/QC assessment of water and sediment quality data from the 2023 reporting year .....	8
Table 2.1. Dissolved metals cases where the filtered values were higher than the total values. Relative percent difference (RPD) is also shown.....	9
Table 2.2. Positive field blank (FB) and travel blank (TB) samples.....	10
Table 2.3. Duplicate sample concentrations greater than 10 times the limit of reporting value, with a relative percent difference (RPD) greater than 50% of the main sample concentration. ....	11
Table 2.4. Limit of reporting values for the 2023 reporting year. ....	12

## 1. Summary of GHHP QA/QC assessment of the water quality and sediment quality data from the 2023 reporting year

### 1. Dissolved metals

- There are 11 dissolved metal cases where the filtered values were higher than the total values. All cases were Zinc samples observed during the November 2022 sampling period. These cases represent 0.8% of the dissolved metal data. The majority of cases (n = 8) showed a relative percent difference more than 50%.

### 2. Field and travel blanks (FB/TB)

- There are 17 cases where a FB/TB sample showed a positive result. These cases represent 3.2% of the FB/TB data.
- Only three FB/TB sample results were trace signatures. Trace signatures are those where a value is equal to or rounds down to the limit of reporting value for that particular measure.
- The remaining 14 cases (2.6% of the FB/TB data) showed a positive blank result.

### 3. Duplicate samples

- There are 20 cases where the duplicate sample concentrations were greater than 10 times the limit of reporting value and had a relative percent difference greater than 50% of the main sample concentration. These cases represent 2.8% of the main/duplicate data.

### 4. Limit of reporting values

- The limit of reporting values were consistent between quarterly samples and the previous reporting year (2022), with the exception of Ammonia-N which was 1 µg/L (previously 2 µg/L).

**Table 1.1.** Dissolved metals cases where the filtered values were higher than the total values. Relative percent difference (RPD) is also shown.

Case No.	Metal	Sampling Event	Site	Filtered (µg/L)	Total (µg/L)	RPD
Case 1	Zinc	Nov-22	NW10	1.9	<1	62
Case 2			NW10	1.5	<1	40
Case 3			NW60	4.6	1.8	88
Case 4			WB10	5.4	1.5	113
Case 5			WB50	2.8	1.6	55
Case 6			WB60	2.2	1.3	51
Case 7			MH60	2.1	<1	71
Case 8			BR10	1.6	<1	46
Case 9			OH30	22	<1	183
Case 10			RCI20	4.4	<1	126
Case 11			RB10	2.5	1.5	50

**Table 1.2.** Positive field blank (FB) and travel blank (TB) samples.

Case No.	Parameter	Sampling Event	Sample	Concentration (µg/L)
Case 1	Total Nitrogen	FB4	Jun-23	2500
Case 2		TB2	Mar-23	40
Case 3		TB3		30
Case 4		TB4	Mar-23	20
Case 5	Total Phosphorus	FB1	Mar-23	3
Case 6	Dissolved zinc	FB3	Nov-22	1.9
Case 7	Ammonia	FB1	Aug-22	4
Case 8		FB1	Mar-23	3
Case 9		TB1		2
Case 10		FB2		3
Case 11		FB3		5
Case 12		FB2	Jun-23	9
Case 13		FB3		3
Case 14		NOx	FB1	Aug-22
Case 15	FB3		Nov-22	3
Case 16	FB4		Jun-23	26
Case 17	FB3		Mar-23	3

**Table 1.3.** Duplicate sample concentrations greater than 10 times the limit of reporting value, with a relative percent difference (RPD) greater than 50% of the main sample concentration.

Case No.	Water quality parameter	Sampling Event	Site	Main sample (µg/L)	Duplicate sample (µg/L)	RPD
Case 1	Aluminium Total	Aug-22	WB40	280	120	80
Case 2			AC40	130	270	70
Case 3			MH40	5.7	54	162
Case 4			BR10	140	65	73
Case 5		Nov-22	NW50	110	27	121
Case 6			WB50	280	140	67
Case 7		Mar-23	CR20	450	160	95
Case 8	Chlorophyll-a	Mar-23	RB20	0.79	0.34	80
Case 9		Jun-23	WB60	0.74	0.42	55
Case 10	TSS	Aug-22	CR30	7	36	135
Case 11		Nov-22	CR10	11	26	81
Case 12		Mar-23	NW60	23	13	56
Case 13			CR20	36	19	62
Case 14	NOx	Aug-22	CR30	27	2	172
Case 15		Nov-22	CR10	22	12	59
Case 16			STI10	21	6	111
Case 17			CR10	22	12	59
Case 18			STI10	21	6	111
Case 19		Jun-23	STI30	3	73	184
Case 20			BR30	5	110	183

**Table 1.4.** Limit of reporting values for the 2023 reporting year.

<b>Type</b>	<b>Parameter</b>	<b>Limit of reporting value</b>
Water	Aluminium Filtered	5 µg/L
	Aluminium Total	5 µg/L
	Copper Filtered	1 µg/L
	Copper Total	1 µg/L
	Lead Filtered	1 µg/L
	Lead Total	1 µg/L
	Manganese Filtered	1 µg/L
	Manganese Total	1 µg/L
	Nickel Filtered	1 µg/L
	Nickel Total	1 µg/L
	Zinc Filtered	1 µg/L
	Zinc Total	1 µg/L
	Orthophosphate-P	2 µg/L
	Total Phosphorous	3 µg/L
	Total Nitrogen	20 µg/L
	Ammonia-N	1 µg/L
	NOx	2 µg/L
Chlorophyll- <i>a</i>	0.02 µg/L	
Sediment	Arsenic	0.5 mg/kg
	Cadmium	0.5 mg/kg
	Copper	0.5 mg/kg
	Lead	0.5 mg/kg
	Mercury	0.01 mg/kg
	Nickel	0.5 mg/kg
	Zinc	0.5 mg/kg

## 2. GHHP reported measures only - Summary of QA/QC assessment of water and sediment quality data from the 2023 reporting year

**\*As only GHHP reported measures were included in the analysis; orthophosphate, ammonia, and NOx were excluded.**

### 1. Dissolved metals

- There are 11 dissolved metal cases where the filtered values were higher than the total values. All cases were Zinc samples observed during the November 2022 sampling period. These cases represent 0.8% of the dissolved metal data. The majority of cases (n = 8) showed a relative percent difference more than 50%.

### 2. Field and travel blanks (FB/TB)

- There are 6 cases where a FB/TB sample showed a positive result. These cases represent 1.3% of the FB/TB data.
- Only two FB/TB sample results were trace signatures. Trace signatures are those where a value is equal to or rounds down to the limit of reporting value for that particular measure.
- The remaining four cases (0.88% of the FB/TB data) showed a positive blank result.

### 3. Duplicate samples

- There are 13 cases where the duplicate sample concentrations were greater than 10 times the limit of reporting value and had a relative percent difference greater than 50% of the main sample concentration. These cases represent 2.2% of the main/duplicate data.

### 4. Limit of reporting values

- All limit of reporting values were consistent between quarterly samples and the previous reporting year (2022).

**Table 2.1.** Dissolved metals cases where the filtered values were higher than the total values. Relative percent difference (RPD) is also shown.

Case No.	Metal	Sampling Event	Site	Filtered (µg/L)	Total (µg/L)	RPD
Case 1	Zinc	Nov-22	NW10	1.9	<1	62
Case 2			NW10	1.5	<1	40
Case 3			NW60	4.6	1.8	88
Case 4			WB10	5.4	1.5	113
Case 5			WB50	2.8	1.6	55
Case 6			WB60	2.2	1.3	51
Case 7			BC30	5	9.7	64
Case 8			MH60	2.1	<1	71
Case 9			BR10	1.6	<1	46
Case 10			OH30	22	<1	183
Case 11			RCI20	4.4	<1	126
Case 12			RB10	2.5	1.5	50

**Table 2.2.** Positive field blank (FB) and travel blank (TB) samples.

<b>Case No.</b>	<b>Parameter</b>	<b>Sampling Event</b>	<b>Sample</b>	<b>Concentration (µg/L)</b>
Case 1	Total Nitrogen	FB4	Jun-23	2500
Case 2		TB2	Mar-23	40
Case 3		TB3		30
Case 4		TB4	Mar-23	20
Case 5	Total Phosphorus	FB1	Mar-23	3
Case 6	Dissolved zinc	FB3	Nov-22	1.9

**Table 2.3.** Duplicate sample concentrations greater than 10 times the limit of reporting value, with a relative percent difference (RPD) greater than 50% of the main sample concentration.

Case No.	Water quality parameter	Sampling Event	Site	Main sample (µg/L)	Duplicate sample (µg/L)	RPD
Case 1	Aluminium Total	Aug-22	WB40	280	120	80
Case 2			AC40	130	270	70
Case 3			MH40	5.7	54	162
Case 4			BR10	140	65	73
Case 5		Nov-22	NW50	110	27	121
Case 6			WB50	280	140	67
Case 7		Mar-23	CR20	450	160	95
Case 8	Chlorophyll-a	Mar-23	RB20	0.79	0.34	80
Case 9		Jun-23	WB60	0.74	0.42	55
Case 10	TSS	Aug-22	CR30	7	36	135
Case 11		Nov-22	CR10	11	26	81
Case 12		Mar-23	NW60	23	13	56
Case 13			CR20	36	19	62

**Table 2.4.** Limit of reporting values for the 2023 reporting year.

Type	Parameter	Limit of reporting value
Water	Aluminium Filtered	5 µg/L
	Aluminium Total	5 µg/L
	Copper Filtered	1 µg/L
	Copper Total	1 µg/L
	Lead Filtered	1 µg/L
	Lead Total	1 µg/L
	Manganese Filtered	1 µg/L
	Manganese Total	1 µg/L
	Nickel Filtered	1 µg/L
	Nickel Total	1 µg/L
	Zinc Filtered	1 µg/L
	Zinc Total	1 µg/L
	Orthophosphate-P	2 µg/L
	Total Phosphorous	3 µg/L
	Total Nitrogen	20 µg/L
	Ammonia-N	1 µg/L
	NOx	2 µg/L
Chlorophyll- <i>a</i>	0.02 µg/L	
Sediment	Arsenic	0.5 mg/kg
	Cadmium	0.5 mg/kg
	Copper	0.5 mg/kg
	Lead	0.5 mg/kg
	Mercury	0.01 mg/kg
	Nickel	0.5 mg/kg
	Zinc	0.5 mg/kg