

METROLINK

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A19.1

**Summary of Analytical
Results – GW Initial
Interim Rounds for
2018/19 summary text**

Appendix A19.1 Initial and Interim Rounds -

Groundwater Quality Summary of Key Descriptions 2018/ 2019 (Historical Monitoring Wells)

Note: Please read alongside tabulated summary of analytical results for 2018-2019 (included herein)

Abbreviations:

GTV – Groundwater Threshold Value

IGV – Interim Guideline Value

LOD – Limit of Detection

Area AZ-1 Northern Section

A single well (RC65) located near Airside Retail Park was sampled in area AZ-1 in both 2018 and 2019. Few exceedances above the GTV were reported namely for ammonia (0.24mg/l, 2018 and 1.03mg/l, 2019). Concentrations slightly above the IGV (30mg/l) were reported for chloride with a notable reported value of sulphate (232mg/l) reported in 2019 which exceeded the GTV (187.5mg/l).

In terms of monitored field parameters for the initial sampling event at RC65, observed pH (7.80 – 7.84) was within the IGV (≥ 6.5 and ≤ 9.5) provided. Electrical conductivity (EC) readings ranged between 868uS/cm - 870uS/cm, i.e. within the upper GTV (1,875uS/cm). Similarly, for the second monitoring event, observed pH (6.84-6.88) was within the IGV and a recorded EC value of 1,196 also lies within the available GTV. No visual or olfactory observations with regard to the presence of hydrocarbon type contamination was noted during either sampling event.

Area AZ-2 Airport Section

There were no available historical wells within this geographical area for the initial baseline sampling.

Area AZ-3 Dardistown to Northwood Section

There were no available historical wells within this geographical area for the initial baseline sampling.

Area AZ-4 Northwood to Charlemont Section - Groundwater quality 2018 -Laboratory and Field:

During the initial sampling event completed between 31/10/2018-07/11/2018, the parameters where recorded concentrations exceeded the available GTV included mercury, sodium, sulphate and chloride with [rare] exceedances of TPH and total ammonia also noted. A single detection of the heavy metal mercury was recorded at borehole location BH02 (2017 GI) i.e. 0.001mg/l which represented a slight exceedance when compared against the GTV of 0.00075mg/l.

Comparably elevated concentrations of sodium were reported for location IGSL/BH/09 located in Cathedral Street, Dublin 1 at 393.7mg/l which exceeded the available GTV (150mg/l). Exceedances of the available GTV (187.5mg/l) for chloride were reported at 2/10 no. boreholes sampled in this initial round, i.e. at IGSL/BH/09 (Cathedral Street) at 517.4mg/l (a significant exceedance in terms) and AGI/RC/MP07 (Blessington Court/ St. Joseph's Place) at 198.9mg/l. The remaining values, while within the available GTV, exceeded the IGV (30mg/l) and ranged between 36.0mg/l –

Exceedances of the available IGV of 5mg/l for potassium were reported at 6/10 no. boreholes sampled with concentrations ranging from 7.6mg/l (AGI/RC/MP07, Blessington Court/ St. Joseph's Place) to 16.3mg/l (IGSL/BH/11, Cathal Brugha Street) -the highest reported value for the round. A single exceedance of the available GTV (187.5mg/l) for sulphate was reported at monitoring well AGI/RC/MP07 (Blessington Court/ St. Joseph's Place) at 204.1mg/l. However, elevated concentrations were also reported for locations IGSL/BH/02 (D), St. Stephen's Green West at 175mg/l, IGSL/BH/11, Cathal Brugha Street at 185.2mg/l, and for location MGI/BH/733, St. Stephen's Green (south central

area) at 121.7mg/l. The remaining concentrations were reported as ranging between 58.4mg/l - 92.3mg/l. 99.7mg/l.

Elevated concentrations above the GTV (0.175mg/l) were reported Total Ammonia as Nitrogen for locations BH03 (2017 GI), St. Ita's Road at 0.29mg/l and IGSL/BH/09, Cathedral Street at 1.47mg/l (the highest reported concentration for the sampling event). The remaining values were reported within the range 0.04mg/l – 0.16mg/l (detection limit is 0.03mg/l).

In terms of organics, detections above LOD were reported for samples collected at monitoring well AGI/RC/MP07 (Blessington Court/ St. Joseph's Place), i.e. total aliphatics and aromatics (C₁₀-C₃₅) at 1.84mg/l exceeding the GTV of 0.0075mg/l; mineral oil (C₁₀-C₄₀) was also reported at 1.56mg/l exceeding the LOD of 0.01mg/l. The laboratory interpreted this water quality as 'lube oil'. The historical borehole was noted as having limited standing water at the time of sampling, observed as 'stagnant' and located within an urban setting.

VOC analysis was carried out on samples taken from historical monitoring well locations BH02 (2017 GI), IGSL/BH/09, AGI/RC/MP07, MGI/BH/733, RC25 and RC65 and entailed testing for approximately 60 compounds within this parameter group, ranging from Dichlorodifluoromethane to 1,2,3-Trichlorobenzene. The results for 6 no. groundwater samples collected during October/ November 2018 were all reported as <LOD.

In terms of monitored field parameters for the initial sampling event, generally, the range of field pH observed was noted as 7.57 – 7.98 and within the IGTV (≥ 6.5 and ≤ 9.5) provided. EC readings ranged between 754uS/cm and 1,570uS/cm, and lie within the upper GTV (1,875uS/cm). No visual or olfactory observations with regard to the presence of hydrocarbon type contamination was noted. *It is noted that the well head protection at some of the historical boreholes was observed as poor with no protective rubber bung or cover sealing ring. As such, it is likely that some locations may have been subject to surface water run-off and ingress to the standpipe.*

[Area AZ-4 Northwood to Charlemont Section - Groundwater quality 2018 -Laboratory and Field:](#)

During the second sampling event completed between 20/03/2019-15/04/2019 the parameters where recorded concentrations exceeded the available GTV included zinc, sodium, sulphate, and chloride with exceedances of total ammonia also noted.

A single detection of the heavy metal zinc was recorded at borehole location IGSL/BH/11 located at Cathal Brugha St., Dublin 1. The reported concentration of 0.09mg/l slightly exceeds the GTV of 0.075mg/l for this metal. The remaining detections for zinc reported above the limit of detection (LOD) ranged between 0.011 – 0.014mg/l.

Other detections for metals above the respective LOD were also noted and include for arsenic (at locations BH02-2017GI, and IGSL/BH/09), chromium (at location IGSL/BH/02 shallow, only), cobalt (at location BH02-2017GI, only), iron (at location BH03-2017GI, IGSL/BH/09 (i.e. 1.044mg/l, which exceeds the IGTV) and RC22), and nickel (at 8/10 locations with the highest reported value at 0.011 mg/l at location BH02-2017GI at Prospect Avenue/ Botanic Road junction; the remaining values are reported at/ slightly above the LOD at 0.002mg/l).

Comparably elevated concentrations of sodium were reported for location IGSL/BH/09 located in Cathedral Street, Dublin 1 at 2,875.0mg/l which exceeds the available GTV/ IGTV of 150mg/l. This reported value represents a significant increase on the result reported for the same borehole in the initial sampling round, i.e. 393.7mg/l. The reported concentrations for the remainder of the boreholes sampled all lie below these guideline values and ranged between 25.9mg/l – 81.9mg/l which is also consistent with the range reported for the initial sampling event. Exceedances of the available GTV (187.5mg/l) for chloride were reported at 2/10 no. boreholes sampled in this round, namely at monitoring borehole IGSL/BH/09 (Cathedral Street, Dublin 1) at 3,592.4mg/l (a significant exceedance in terms and much elevated since the value of 517.4mg/l reported for this borehole during the initial sampling event) and AGI/RC/MP07 (Blessington Court/ St. Joseph's Place) at 200.0mg/l (slightly up from 198.9mg/l in the initial round). The remaining values - while within the available GTV - did exceed the

lower IGV of 30mg/l, with a range of 31.6mg/l – 93.8mg/l reported for the second round; this range is consistent with that of the initial monitoring round.

Exceedances of the available IGV (5mg/l) for potassium were reported at 7/10 no. boreholes sampled in March/ April 2019. Concentrations reported at above the IGV ranged from 5.3mg/l (AGI/RC/MP07, Blessington Court (St. Joseph's Place) to 30.3mg/l (IGSL/BH/09, Cathedral Street, Dublin 1) -the highest reported value for the round. The remaining values for potassium were reported below the IGV and ranged between 0.9mg/l - 2.6mg/l. Exceedances of the available GTV (187.5mg/l) for sulphate was reported at monitoring well locations IGSL/BH/02 shallow (189.1mg/l), IGSL/BH/02 deep (197.2mg/l), IGSL/BH/09 (Cathedral Street, Dublin 1 at 828.5mg/l, the highest reported concentration for the second round), and AGI/RC/MP07 (249.2mg/l). The reported values for the remainder of the boreholes sampled ranged between 53.5mg/l – 175.2mg/l.

For Total Ammonia as Nitrogen, elevated concentrations above the GTV (0.175mg/l) were reported for locations BH02-2017GI, Prospect Ave./ Botanic Road junction at 0.19mg/l; BH03-2017GI, St. Ita's Road at 0.25mg/l; IGSL/BH/09, Cathedral Street at 1.34mg/l (the highest reported concentration for the initial and interim sampling events), and RC22, St. Mobhi Boithrin at 0.19mg/l, The remaining values were reported within the range <LOD – 0.11mg/l, with the LOD provided at 0.03mg/l for this analyte.

The laboratory tests carried out on 10 no. samples for organics as part of the second sampling event all indicated results at <LOD for each of the individual analytes. Similarly, the results for testing of groundwater samples for Volatile Organic Compounds (VOCs) collected during March/ April 2019 were all reported as <LOD.

In terms of monitored field parameters for the second sampling event, generally, the range of field pH observed was consistent with the initial round and noted as 6.69 – 7.46, i.e. within the IGV (≥ 6.5 and ≤ 9.5) provided. Electrical conductivity (EC) readings collected ranged between 705uS/cm and 1,467uS/cm for the second monitoring round and is consistent with the range reported for the initial sampling event, i.e. 754uS/cm and 1,570uS/cm, and lie within the upper GTV (1,875uS/cm). No field visual or olfactory observations with regard to the presence of hydrocarbon type contamination was noted.