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A20.5 Laboratory Data Screening Summaries

Contents

20. Laboratory Data Screening Summaries

For the purposes of this assessment the soil chemical data, with regard to chronic exposure risk, have been screened against human health generic assessment criteria (GAC). In the absence of any Ireland-specific screening values, the assessment criteria are based primarily on UK publications including LQM/CIEH (Nathanial et al. 2015) 'Suitable for Use Levels' (S4Uls) for residential and commercial/industrial land uses and Department for Environment, Food and Rural Affairs (DEFRA) Category 4 Screening Levels (C4SLs) (DEFRA 2014). GAC for acute short-term exposure risks are not available, the above GAC have been used to provide an indication of potential risk to construction and maintenance workers. For perfluorooctane sulfonate (PFOS), screening values have been published by the Environment Agency in England (EA 2020).

GAC for organic chemicals are dependent on the soil organic matter (SOM) of the soils. GAC are published for SOM contents of 1%, 2.5% and 6%. As SOM values are not available for all of the locations subjected to chemical testing, the most conservative value of 1% has been selected. Soil, leachate and groundwater laboratory analysis data have been compared to relevant water quality standards, referred to as Controlled Waters Screening Criteria (CWSC). These are primarily derived from Irish EPA Interim Guideline Values (IGV) (EPA 2003). Where these are not available for determinands, UK freshwater Environmental Quality Standards (EQS) (WFD 2015) or UK Drinking Water Standards (UK DWS) (World Health Organization (WHO 2011)) have been used.

The results of the data screening are included in this Appendix for each AZ and element of the proposed Project. Tables of soil, leachate, groundwater and ground gas data screening are included.

Information on the baseline concentrations of heavy metals has been obtained from the Dublin Soil Urban Geochemistry (SURGE) Project (GSI 2012). This study found that concentrations of lead, copper, zinc and mercury are strongly influenced by human activities, such as industry, combustion and traffic. Other metallic elements are generally related to the regional bedrock parent material. Polycyclic aromatic hydrocarbons (PAHs) were detected across the city, with the greatest concentrations in the city centre. Polychlorinated biphenyl (PCBs) were detected at low levels in isolated samples.

20.1 AZ1 Northern Section

Table 20.1: Summary of Soil GAC Exceedances in AZ1

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail
Inside Works Area				
ABH02	12	1	0	Arsenic
ABH08	1.3	1	0	Mercury
ABH09	3	1	0	1,2-Dichloroethane
ATP17	0.5	3	0	Benzo[b]fluoranthene, Benzo[a]pyrene, Dibenz(a,h)Anthracene
BH101	0.6	1	0	Chromium[1]
BH103	0.6	1	0	Chromium[1]
BH142ACP	0.5	1	0	Chromium[1]
BH209ACP	0.4	1	0	Chromium[1]
BH210ACP	0.5	1	0	Chromium[1]
BH212	1.1	1	0	Chromium[1]
NBH201	0.5	1	0	Chromium[1]
NBH402	1	1	0	Chromium[1]
NBH403	0.5	1	0	Chromium[1]
NBH403	1	1	0	Chromium[1]
NBH404	1	2	0	Arsenic, Chromium[1]

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail
NBH406	0.5	1	0	Chromium[1]
NBH407	0.5	1	0	Chromium[1]
NBH408	0.5	1	0	Chromium[1]
NBH72	0.5	1	0	Chromium[1]
NTP03	0.5	1	0	Chromium[1]
RC104	0.5	1	0	Chromium[1]
RC108	0.4	1	0	Chromium[1]
RC114	1	1	0	Chromium[1]
RC121	1	1	0	Chromium[1]
RC122	1	1	0	Chromium[1]
RC127	1.2	1	0	Chromium[1]
RC203	0.6	1	0	Chromium[1]
RC205	0.1	1	0	Chromium[1]
RC205	0.5	1	0	Chromium[1]
RC205	1	1	0	Chromium[1]
RC207	1	1	0	Chromium[1]
TP122	0.5	1	0	Chromium[1]
TP126	1	1	0	Chromium[1]
TP134	1	1	0	Chromium[1]
TP135	0.5	1	0	Chromium[1]
TP136	0.4	1	0	Chromium[1]
TP139	0.5	1	0	Chromium[1]
TP140	1.1	1	0	Chromium[1]
TP141	0.1	1	0	Chromium[1]
TP149	0.5	1	0	Chromium[1]
TP154	0.4	1	0	Chromium[1]
TP208	0.5	1	0	Chromium[1]
TP210	1	1	0	Chromium[1]
TP212	0.5	1	0	Chromium[1]
Within 250m of Works Area				
BH123ACP	1	1	0	Chromium[1]
BH139ACP	1	1	0	Chromium[1]
NBH405	0.5	1	0	Chromium[1]
NBH405	1	1	0	Chromium[1]
TP119	1	1	0	Chromium[1]
SURGE_2014	0.1	1	0	Lead

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.2: Summary of Soil VOC/ SVOC Detections in AZ1

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
Inside Works Area			
ABH02	5	1	Isopropylbenzene
ABH08	3.8	1	2-Methylnaphthalene
ABH08	4.8	1	2-Methylnaphthalene
ABH09	3	2	1,2-Dichloroethane, Toluene
ABH09	11.5	3	Dibenzofuran, Carbazole, 2-Methylnaphthalene
ATP14	1.5	1	1,2-Dichloroethane
NBH403	7.3	2	Toluene, Trichloromethane
NBH404	5.1	2	Toluene, Trichloromethane

Table 20.3: Summary of CWSC Exceedances (Groundwater) in AZ1

Works Area	Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
ESTUARY PARK & RIDE	NBH72-S	1	DWS	Ammoniacal Nitrogen as N
		4	IGV	Chloride, Iron, Manganese, Total Petroleum Hydrocarbons
ESTUARY - SEATOWN	NBH401	3	IGV	Chloride, Potassium, Boron
	NBH402	1	DWS	Phosphorus
		3	IGV	Chloride, Potassium, Boron
	NBH406	3	IGV	Manganese, Potassium, Boron
	RC104	1	IGV	Boron
	RC108	1	IGV	Boron
BROAD MEADOW VIADUCT	RC143-D	1	IGV	Boron
FOSTERTOWN – NORTH PORTAL	ABH08	1	DWS	Ammoniacal Nitrogen as N
		1	EQS	Biological Oxygen Demand
		2	IGV	Chloride, Barium
	ABH08ii	1	DWS	Ammoniacal Nitrogen as N
		3	IGV	Calcium, Chloride, Total Petroleum Hydrocarbons
	ABH09	1	DWS	Ammoniacal Nitrogen as N
		1	IGV	Chloride

Table 20.4: Summary of CWSC Exceedances (Leachate) in AZ1

Works Area	Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
ESTUARY - SEATOWN	ATP07	0.5	1	IGV	Phenols
		4.1	2	DWS	Antimony, Selenium
		11	1	DWS	Antimony
		11	1	IGV	Nickel
	NBH402	0.5	1	IGV	Chloride
	NBH403	7.3	1	DWS	Selenium
	NBH406	0.5	1	IGV	Mercury
	NBH407	0.5	1	IGV	Mercury
	NBH408	0.5	1	IGV	Mercury
SEATOWN STATION	ABH01	1	1	IGV	Phenols
		4	1	DWS	Selenium

Works Area	Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
		5	1	DWS	Selenium
		5	1	IGV	Phenols
		7.6	1	IGV	Phenols
		14	2	IGV	Chloride, Arsenic
	ABH02	4	1	DWS	Selenium
		5	1	DWS	Selenium
		7	1	DWS	Selenium
		12	1	DWS	Selenium
SWORDS STATION	ABH03	4	1	DWS	Selenium
FOSTERTOWN STATION	ABH05	2.5	1	DWS	Selenium
		9.9	1	DWS	Selenium
		9.9	1	IGV	Chromium
		12	1	DWS	Selenium
		12	2	IGV	Arsenic, Chromium
	ABH06	1	1	DWS	Selenium
		1	1	IGV	Chloride
		15	1	DWS	Selenium
	ABH07	8.5	1	DWS	Selenium
		13.5	1	DWS	Selenium
FOSTERTOWN C/C&C	ABH08	1.3	1	DWS	Antimony
		3.8	1	DWS	Selenium
		4.8	1	DWS	Selenium
		8	1	DWS	Selenium
NORTH PORTAL	ABH09	8.6	1	DWS	Selenium
		11.5	1	DWS	Selenium
		19.8	1	DWS	Selenium

20.2 AZ2 Airport Section

Table 20.5: Summary of Soil GAC exceedances in AZ2

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail	
Inside Works Area					
ABH12	1.7	5	0	Arsenic, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene	
ABH12	2.7	1	0	Arsenic	
ABH13	0.7	1	0	Lead	
ABH13	3.7	1	0	Arsenic	
ABH13	10	1	0	Arsenic	
ABH13	20	1	0	Arsenic	
ABH14	0.3	2	0	Arsenic, Lead	
ATP26	1.7	6	0	Aromatic TPH >C8-C10, Aromatic TPH >C10-C12, Aromatic TPH >C12-C16, Aromatic TPH >C16-C21, Aliphatic TPH >C8-C10, Aliphatic TPH >C10-C12, Dibenz(a,h)Anthracene	
ATP27	0.3	1	0	Dibenz(a,h)Anthracene	
NBH05	0.5	1	0	Chromium[1]	
NBH07	0.5	1	0	Chromium[1]	
NBH60	0.5	7	2	Residential	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene, Indeno(1,2,3-c,d)Pyrene, Chromium
				Commercial	Benzo[b]fluoranthene, Dibenz(a,h)Anthracene
NBH60	1	1	0	Chromium[1]	
NBH61	1	3	1	Residential	Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Chromium
				Commercial	Dibenz(a,h)Anthracene
NBH62	0.5	1	0	Chromium[1]	
Within 250m of Works Area					
NBH501	0.5	1	0	Chromium[1]	
NBH502	0.5	1	0	Chromium[1]	
NTP501	0.5	1	0	Chromium[1]	
NTP502	0.5	1	0	Chromium[1]	
NTP508	2	1	0	Chromium[1]	

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.6: Summary of Soil VOC Detections in AZ2

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
Inside Works Area			
ABH12	1.7	2	Dibenzofuran, Carbazole

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
ABH13	1.3	10	Benzene, Toluene, Ethylbenzene, m & p-Xylene, o-Xylene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Isopropylbenzene, N-Propylbenzene, 4-Isopropyltoluene
ABH13	2.7	5	Benzene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Isopropylbenzene, N-Propylbenzene, Sec-Butylbenzene
ABH13	10	2	Benzene, Trichloroethene
ABH17	1	2	Dibenzofuran, 2-Methylnaphthalene
ABH17	10	2	Diethyl Phthalate, 2-Methylnaphthalene
ATP26	1.7	2	Bis(2-Ethylhexyl)Phthalate, Di-N-Octyl Phthalate
ATP27	0.3	1	Carbazole
ATP28	0.7	3	Dibenzofuran, Carbazole, 2-Methylnaphthalene

Table 20.7: Detail of Asbestos Detections in AZ2

Exploratory Location	Sample Depth (m)	Asbestos Detected	Detail
Within 250m of Works Area			
ATP27	0.3	Amosite	Fibres/clumps, 0.001%

Table 20.8: Summary of CWSC Exceedances (Groundwater) in AZ2

Works Area	Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area				
DUBLIN AIRPORT	NBH04	3	DWS	1,1,1,2-Tetrachloroethane, Ammoniacal Nitrogen as N, Aliphatic TPH >C12-C16
		1	EQS	Cobalt
		7	IGV	Chloride, 1,1,1-Trichloroethane, Iron, Manganese, Barium, Boron, Total Petroleum Hydrocarbons
	NBH60	3	DWS	1,1,1,2-Tetrachloroethane, Aromatic TPH >C16-C21, Aromatic TPH >C21-C35
		6	IGV	Chloride, Benzo[g,h,i]perylene, Indeno(1,2,3-c,d)Pyrene, Fluoranthene, Benzo[a]pyrene, Total Petroleum Hydrocarbons
	NBH61	1	IGV	Chloride
	NBH62	1	DWS	Phosphorus
		5	IGV	Chloride, Manganese, Barium, Boron, Total Petroleum Hydrocarbons
SOUTH PORTAL	MN/104/BH/003	2	DWS	N-Nitrosodi-N-propylamine, Ammoniacal Nitrogen as N
		1	IGV	Chloride
	NBH06A	1	DWS	Ammoniacal Nitrogen as N
		4	IGV	Chloride, Iron, Manganese, Boron
	NBH06W	1	DWS	Ammoniacal Nitrogen as N
		1	EQS	Biological Oxygen Demand
		4	IGV	Chloride, Fluoride, Potassium, Boron
Within 250m of Works Area				
DUBLIN AIRPORT <250m	ABH12	1	DWS	Ammoniacal Nitrogen as N
		1	EQS	Biological Oxygen Demand
		4	IGV	Chloride, Barium, Iron, Potassium

Table 20.9: Summary of CWSC Exceedances (Leachate) in AZ2

Works Area	Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area					
DUBLIN AIRPORT	ABH14	0.3	1	IGV	Barium
	ABH14a	0.7	1	DWS	Antimony
	NBH60	1	1	IGV	Sulphate (2:1 Water Soluble) as SO4
SOUTH PORTAL	ABH17	0.4	1	IGV	Phenols
		10	1	DWS	Selenium
Within 250m of Works Area					
FTWN - NTH PRTL <250	NTP501	0.5	1	IGV	Total Dissolved Solids (TDS)
	NTP504	0.5	1	IGV	Lead
	NTP506	0.5	1	IGV	Lead
DUBLIN AIRPORT <250	ABH11	20	1	DWS	Selenium

20.3 AZ3 Dardistown to Northwood

Table 20.10: Summary of Soil GAC Exceedances in AZ3

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail
Inside Works Area				
NBH08	1	3	0	Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene
NBH73	0.5	1	0	Chromium[1]
ABH19	2	1	0	Naphthalene

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.11: Summary of CWSC (Groundwater) Exceedances in AZ3

Works Area	Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
DARDISTOWN DEPOT	AWN01	1	DWS	Ammoniacal Nitrogen as N
		5	IGV	Chloride, Iron, Manganese, Potassium, Boron
	AWN02	2	DWS	Selenium, Ammoniacal Nitrogen as N
		2	IGV	Manganese, Boron
	MN/104/BH/002A	1	DWS	Ammoniacal Nitrogen as N
		5	IGV	Bis(2-Ethylhexyl)Phthalate, Chloride, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Total TPH
	MN/104/TP/006	1	DWS	Ammoniacal Nitrogen as N
		3	IGV	Nitrite, Chloride, Conductivity, Sulphate, Total TPH
NORTHWOOD C/C&C	NBH12	1	DWS	Ammoniacal Nitrogen as N
		3	IGV	Chloride, Manganese, Boron
NORTHWOOD TUNNEL	NBH73-S	2	IGV	Manganese, Boron

Table 20.12: Summary of CWSC (Leachate) Exceedances in AZ3

Works Area	Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
DARDISTOWN DEPOT	ATP30i	2.5	1	DWS	Selenium
	MN/104/TP/005	4.2	2	IGV	Barium, Zinc
	MN/104/TP/006	0.4	1	IGV	Barium
	MN/104/TP/007	1.1	1	DWS	Antimony
		1.1	1	IGV	Barium
	MN/104/TP/009	1.8	2	IGV	Chloride, Barium
	MN/104/TP/010	1.6	2	IGV	Barium, Zinc
	MN104/TP/001	0.8	2	IGV	Barium, Zinc
NORTHWOOD C/C&C	ABH18	9	1	DWS	Selenium
		11.5	1	DWS	Selenium
		21.8	1	DWS	Selenium
	ABH19	0.5	1	IGV	Sulphate (2:1 Water Soluble) as SO4
		2	1	DWS	Selenium
		10	1	DWS	Selenium
		13	1	DWS	Selenium
		23	1	DWS	Selenium
	ABH20	2	1	DWS	Selenium
		4	1	DWS	Selenium
		7.45	1	DWS	Selenium

20.4 AZ4 Northwood to Charlemont

20.4.1 Ballymun Station

Table 20.13: Summary of Soil GAC Exceedances in the Ballymun Station Area

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail
Within 250m of Works Area				
NBH204	0.4	1	0	Chromium[1]

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.14: Summary of Soil VOC/SVOC Detections in the Ballymun Station Area

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
Inside Works Area			
ABH23	19.24	3	Toluene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene
NBH203A	0.5	1	Bis(2-Ethylhexyl) Phthalate
Within 250m of Works Area			
NBH101	2.5	7	Ethylbenzene, o-Xylene, m & p-Xylene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, N-Butylbenzene, N-Propylbenzene

Table 20.15: Detail of Asbestos Detections the Ballymun Station Area

Exploratory Location	Sample Depth (m)	Asbestos Detected	Detail
Within 250m of Works Area			
NBH80	0.3	Amosite	< 0.001%
NBH80	1.2	Amosite	< 0.001%

Table 20.16: Summary of CWSC Exceedances (Groundwater) in the Vicinity of Ballymun Station

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
NBH203A-S	4	DWS	Ammoniacal Nitrogen as N, Aromatic TPH >C_{21}-C_{35}, Aliphatic TPH >C_{10}-C_{12}, Aliphatic TPH >C_{21}-C_{35}
	1	EQS	Biological Oxygen Demand
	3	IGV	Manganese, Potassium, Total Petroleum Hydrocarbons
NBH203A-D	4	DWS	Vinyl Chloride, Ammoniacal Nitrogen as N, Aromatic TPH >C_{12}-C_{16}, Aliphatic TPH >C_{12}-C_{16}
	6	IGV	Chloride, Aluminium, Manganese, Potassium, Boron, Total Petroleum Hydrocarbons
ABH25	1	DWS	Ammoniacal Nitrogen as N
	3	IGV	Chloride, Total Dissolved Solids, Total Petroleum Hydrocarbons

Table 20.17: Summary of CWSC Exceedances (Leachate) in the Vicinity of Ballymun Station

Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area				
ABH23	5.5	1	DWS	Selenium
	10.5	1	DWS	Selenium
	29.7	2	IGV	Arsenic, Chromium
ABH24A	1.5	1	DWS	Selenium
ABH24B	0.7	1	IGV	Phenols
	1.8	1	IGV	Phenols
	4.8	1	DWS	Selenium
	22	2	DWS	Antimony, Selenium
ABH25	8.7	1	DWS	Selenium
ATP37	2.6	1	DWS	Selenium
Within 250m of Works Area				
NBH204	0.4	5	IGV	Chloride, Barium, Chromium, Total Dissolved Solids, pH

20.4.2 Collins Avenue Station

Table 20.18: Summary of Soil GAC Exceedances in the Collins Avenue Station Area

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail
Within 250m of Works Area				
NBH206	0.5	3	0	Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Chromium[1]
NBH207	0.5	2	0	Dibenz(a,h)Anthracene, Chromium[1]
NBH207	1	2	0	Dibenz(a,h)Anthracene, Pentachlorophenol

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.19: Detail of Asbestos Detections in the Collins Avenue Station Area

Exploratory Location	Sample Depth (m)	Asbestos Detected	Detail
Within 250m of Works Area			
NBH206	0.5	Chrysotile	Fibres/clumps, 0.002%
NBH207	0.5	Chrysotile	Free fibres, 0.002%

Table 20.20: Detail of Soil VOC/SVOC Detections in the Collins Avenue Station Area

Exploratory Location	Sample Depth (m)	No. of VOCs/SVOCs >LOD	Detail
Within 250m of Works Area			
NBH207	1	1	Pentachlorophenol

Table 20.21: Summary of CWSC Exceedances (Groundwater) in the Vicinity of Collins Avenue

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area			
NBH207-D	1	DWS	Ammoniacal Nitrogen as N
	3	IGV	Chloride, Manganese, Boron
Within 250m of Works Area			
NBH102-S	1	DWS	Ammoniacal Nitrogen as N
	4	IGV	Chloride, Iron, Manganese, Boron

Table 20.22: Summary of CWSC Exceedances (Leachate) in the Vicinity of Collins Avenue Station

Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
ABH27	3	1	DWS	Selenium
	29.1	2	DWS	Antimony, Selenium
ABH28	4	1	DWS	Selenium
	14.8	1	DWS	Selenium
	21.2	1	DWS	Antimony
	27	1	DWS	Antimony
ABH29	2.5	2	IGV	Barium, Total Dissolved Solids
	3.5	1	DWS	Selenium
	3.5	1	IGV	Barium
	2	1	DWS	Selenium
	11.3	1	DWS	Selenium
	25	1	DWS	Selenium
NBH207	0.5	4	IGV	Fluoride, Nickel, Zinc, pH

20.4.3 Albert College Park Intervention Shaft

Table 20.23: Summary of Soil GAC Exceedances in the Albert College Intervention Shaft Area

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail
Inside Works Area				
ABH30i	13	1	0	Arsenic
Within 250m of Works Area				
MGI/BH/604	1	1	0	Chromium[1]
MGI/BH/612	1	1	0	Chromium[1]

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.24: Detail of Soil VOC/SVOC Detections in the Albert College Intervention Shaft Area

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
Within 250m of Works Area			
MGI/BH/604	1	1	Bromodichloromethane
MGI/BH/612	1	1	Bromodichloromethane

Table 20.25: Summary of CWSC Exceedances (Groundwater) in the vicinity of the Albert College Park Intervention Shaft

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
ABH30i	2	DWS	Selenium, Ammoniacal Nitrogen as N
	1	EQS	Biological Oxygen Demand
	7	IGV	Nitrite, Chloride, Iron, Manganese, Nickel, Potassium, Boron

Table 20.26: Summary of CWSC Exceedances (Leachate) in the vicinity of the Albert College Park Intervention Shaft

Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
ABH30i	28	1	DWS	Antimony
NBH208	0.5	1	IGV	Phenols

20.4.4 Griffiths Park Station

Table 20.27: Summary of Soil GAC Exceedances in the Griffith Park Area

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail	
Inside Works Area					
NBH17	1	1	0	Chromium[1]	
NBH211	0.5	1	0	Chromium[1]	
ABH32	14.5	6	1	Residential	Aromatic TPH >C8-C10, Aromatic TPH >C10-C12, Aromatic TPH >C12-C16, Aliphatic TPH >C8-C10, Aliphatic TPH >C10-C12, Aliphatic TPH >C12-C16
				Commercial	Aliphatic TPH >C8-C10
Within 250m of Works Area					
SURGE_2132	0.1	1	0	Beryllium	

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.28: Detail of Soil VOC/SVOC detections in the Griffith Park area

Exploratory Location	Sample Depth (m)	No. of VOCs/SVOCs >LOD	Detail
Within 250m of Works Area			
ABH32	14.5	2	Benzene, Toluene

Table 20.29: Summary of CWSC Exceedances (Groundwater) in the Vicinity of Griffith Park Station

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
NBH17	1	DWS	Selenium
	1	EQS	Biological Oxygen Demand
	7	IGV	Nitrite, Nitrate, Iron, Manganese, Mercury, Potassium, Boron
NBH211	1	DWS	Ammoniacal Nitrogen as N
	4	IGV	Chloride, Iron, Manganese, Boron
NBH223-S	1	DWS	Ammoniacal Nitrogen as N
	1	EQS	Biological Oxygen Demand
	7	IGV	Chloride, Benzene, Iron, Manganese, Potassium, Barium, Boron
NBH223-D	1	DWS	Ammoniacal Nitrogen as N
	4	IGV	Chloride, Manganese, Potassium, Barium

Table 20.30: Summary of CWSC Exceedances (Leachate) in the Vicinity of Griffith Park Station

Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area				
ABH33	10.5	1	DWS	Antimony
	25	1	DWS	Antimony
NBH223	0.5	1	IGV	Mercury
Within 250m of Works Area				
BH04 (GII)	1.5	1	DWS	Molybdenum
	1.5	3	IGV	Chloride, Fluoride, Total Dissolved Solids

20.4.5 Glasnevin Station

Table 20.31: Summary of Soil GAC Exceedances in the Glasnevin Area

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail	
Inside Works Area (Station Box)					
ABH37	0.5	7	0	Arsenic, Lead, Mercury, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, 1,2-Dichloroethane	
ABH37	10.5	1	0	Mercury	
ABH38	0.5	1	0	Lead	
GBH01	0.5	3	0	Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Lead	
Inside Works Area (West of Station Box)					
GBH02	0.5	2	0	Benzo[b]fluoranthene, Dibenz(a,h)Anthracene	
GBH05	1.2	10	2	Residential	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene, Indeno(1,2,3-c,d)Pyrene, Naphthalene, Aromatic TPH >C12-C16, Aromatic TPH >C16-C21, Aromatic TPH >C21-C35
				Commercial	Benzo[b]fluoranthene, Dibenz(a,h)Anthracene
GTP11	0.4	1	0	Arsenic	
GTP13	1	1	0	Chromium[1]	
GTP22	0.5	1	0	Lead	

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail	
GTP24	1	2	0	Benzo[b]fluoranthene, Chromium[1]	
GTP25	0.5	3	1	Residential	Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Chromium[1]
				Commercial	Chromium[1]
GTP25	1	1	0	Benzo[b]fluoranthene	
NBH19A	0.3	7	0	Chromium[1], Lead, Arsenic, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Arsenic	
NBH19A	0.5	9	1	Residential	Arsenic, Benzo[a]anthracene, Lead, Dibenz(a,h)Anthracene, Chrysene, Benzo[b]fluoranthene, Benzo[a]pyrene, Chromium[1], Naphthalene
				Commercial	Dibenz(a,h)Anthracene
NBH20	0.3	2	1	Residential	Arsenic, Chromium[1]
				Commercial	Chromium[1]
Within 250m of Works Area					
ABH35	19	1	0	1,2-Dichloroethane	
GTP14	0.5	1	0	Chromium[1]	
GTP19	0.5	1	0	Dibenz(a,h)Anthracene	
GTP21	0.5	1	0	Chromium[1]	
NBH104	0.3	7	0	Chromium[1], Mercury, Arsenic, Lead, Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Benzo[b]fluoranthene	
NBH18	0.5	1	0	Chromium[1]	
NBH18	1	2	0	Arsenic, Lead	
SURGE_2125	0.1	3	0	Lead, Mercury, Beryllium	
SURGE_2126	0.1	3	0	Lead, Dibenz(a,h)Anthracene, Beryllium	
SURGE_2129	0.1	7	0	Benzo[a]pyrene, Lead, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Benzo[a]anthracene, Mercury, Beryllium	

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.32: Detail of Soil VOC/SVOC (including BTEX) Detections in the Glasnevin Area

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
Inside Works Area (Station Box)			
ABH37	0.5	1	Carbazole
ABH38	0.5	2	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene
Inside Works Area (West of Station Box)			
GTP25	1	1	Carbazole
NBH19A	0.5	3	2-Methylnaphthalene, Carbazole, Dibenzofuran
TPCC04	0.6	9	Benzene, Toluene, Ethylbenzene, o-Xylene, m & p-Xylene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Isopropylbenzene, N-Propylbenzene
Within 250m of Works Area			

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
ABH35	19	1	1,2-Dichloroethane
NBH104	0.3	3	2-Methylnaphthalene, Carbazole, Dibenzofuran

Table 20.33: Summary of CWSC Exceedances (Groundwater) in the Vicinity of Glasnevin Station

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area (station box)			
GBH01-S	1	DWS	Ammoniacal Nitrogen as N
	1	EQS	Biological Oxygen Demand
	4	IGV	Chloride, Iron, Manganese, Potassium
GBH01-D	1	DWS	Ammoniacal Nitrogen as N
	4	IGV	Chloride, Iron, Manganese, Hardness, Calcium as CaCO3
Inside Works Area (west of station box)			
GBH02-S	1	DWS	Ammoniacal Nitrogen as N
	3	IGV	Chloride, Iron, Manganese
GBH02-D	1	DWS	Ammoniacal Nitrogen as N
	4	IGV	Chloride, Iron, Manganese, Potassium
GBH04-S	1	DWS	Ammoniacal Nitrogen as N
	1	EQS	Cobalt
	4	IGV	Chloride, Iron, Manganese, Hardness, Calcium as CaCO3
GBH04-D	1	DWS	Ammoniacal Nitrogen as N
	6	IGV	Chloride, Iron, Manganese, Potassium, Barium, Sulphate
GBH13	1	DWS	Ammoniacal Nitrogen as N
	3	IGV	Chloride, Iron, Manganese
NBH19A	3	IGV	Chloride, Manganese, Boron
NBH19W	1	EQS	Biological Oxygen Demand
	4	IGV	Chloride, Iron, Manganese, Boron
NBH20-S	1	DWS	Ammoniacal Nitrogen as N
	3	IGV	Manganese, Barium, Boron
Within 250m of Works Area			
BH02A	1	DWS	Ammoniacal Nitrogen as N
	4	IGV	Chloride, Iron, Manganese, Potassium
GBH06	1	DWS	Ammoniacal Nitrogen as N
	4	IGV	Chloride, Fluoride, Iron, Manganese
GBH09	1	DWS	Ammoniacal Nitrogen as N
	1	EQS	Biological Oxygen Demand
	2	IGV	Chloride, Manganese
GBH11	1	DWS	Ammoniacal Nitrogen as N
	2	IGV	Manganese, Potassium
NBH18-S	1	DWS	Ammoniacal Nitrogen as N
	5	IGV	Nitrite, Chloride, Iron, Manganese, Boron
NBH213	2	DWS	Ammoniacal Nitrogen as N, Antimony
	3	IGV	Total Dissolved Solids, Chloride, Potassium

Table 20.34: Summary of CWSC Exceedances (Leachate) in the Vicinity of Glasnevin Station

Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area (Station Box)				
ABH37	0.5	1	IGV	Arsenic
	4.5	1	DWS	Selenium
	5.5	1	DWS	Selenium
ABH38	24.3	2	DWS	Antimony, Selenium
GBH01	0.5	2	IGV	Chloride, Arsenic
TPCC12	0.4	1	DWS	Selenium
Inside Works Area (West of Station Box)				
GBH12	1.2	1	DWS	Selenium
	1.2	1	IGV	Sulphate (2:1 Water Soluble) as SO4
GBH18	1	1	DWS	Selenium
	1	1	IGV	Chloride
GBH19	2	1	DWS	Selenium
GBH29	1.8	1	DWS	Selenium
GBH32	1	1	DWS	Antimony
	1	1	IGV	Barium
GTP22	0.5	1	IGV	Barium
GTP25	0.5	1	IGV	Chloride
NBH19A	0.3	1	DWS	Molybdenum
Within 250m of Works Area				
BH02A	1	1	DWS	Molybdenum
	1	1	IGV	Nickel
GBH11	0.5	1	IGV	Phenols
	2	1	IGV	Phenols
	4	1	DWS	Selenium
	4	2	IGV	Chloride, Phenols

20.4.6 Mater Station

Table 20.35: Summary of Soil GAC Exceedances in the Mater Station Area

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail	
Inside Works Area					
ABH40	14.6	1	0	Mercury	
ABH41	0.5	8	2	Residential	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene, Indeno(1,2,3-c,d)Pyrene, Naphthalene, Lead
				Commercial	Benzo[b]fluoranthene, Dibenz(a,h)Anthracene
ABH41	13	1	0	Mercury	
NBH21	1	2	0	Benzo[b]fluoranthene, Indeno(1,2,3-c,d)Pyrene	
NBH215	1	1	0	Chromium[1]	

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail	
NBH216A	0.25	14	4	Residential	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene, Fluoranthene, Indeno(1,2,3-c,d)Pyrene, Naphthalene, Phenanthrene, Pyrene, Aromatic TPH >C12-C16, Aromatic TPH >C16-C21, Aromatic TPH >C21-C35, Chromium
				Commercial	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene
NBH216A	0.6	6	1	Residential	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene, Naphthalene
				Commercial	Dibenz(a,h)Anthracene
NBH216A	1.2	5	0	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Mercury	
Within 250m of Works Area					
A1	0.2	2	0	Beryllium, Lead	
C	1.2	3	0	Dibenz(a,h)Anthracene, Beryllium, Lead	
D	0.6	3	0	Lead, Beryllium, Arsenic	
D	1.2	3	0	Lead, Beryllium, Arsenic	
MGI/BH/640	0.5	3	0	Dibenz(a,h)Anthracene, Mercury, Lead	
MGI/BH/640	1.5	1	0	Chromium[1]	
MGI/BH/641	0.5	1	0	Chromium[1]	
MGI/BH/642A	1	2	0	Dibenz(a,h)Anthracene, Tetrachloroethene	
MGI/BH/701	0.5	2	0	Tetrachloroethene, Benzo[b]fluoranthene	
NBH214	0.5	15	3	Residential	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene, Fluoranthene, Indeno(1,2,3-c,d)Pyrene, Naphthalene, Phenanthrene, Aromatic TPH >C12-C16, Aromatic TPH >C16-C21, Aromatic TPH >C21-C35, Arsenic, Chromium[1], Lead
				Commercial	Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene
SURGE_2122	0.1	6	0	Benzo[a]pyrene, Lead, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Mercury, Beryllium	

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.36: Detail of Soil VOC/SVOC Detections in the Mater Station Area

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
Inside Works Area			
ABH40A	2.3	3	2-Methylnaphthalene, Carbazole, Dibenzofuran
ABH41	0.5	2	Carbazole, Dibenzofuran

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
ABH41	18.2	1	1,2,4-Trichlorobenzene
NBH21	1	1	Dibenzofuran
NBH215	1	1	Benzene
NBH216A	0.25	5	Toluene, o-Xylene, 1,2,4-Trimethylbenzene, Carbazole, Dibenzofuran
Within 250m of Works Area			
B1	1.2	5	Benzene, Toluene, Ethylbenzene, Xylenes, Total, Methyl Tert-Butyl Ether
MGI/BH/640	0.5	2	Dichloromethane, Bromodichloromethane
MGI/BH/640	1.5	1	Bromodichloromethane
MGI/BH/642A	1	1	Bromodichloromethane
MGI/BH/701	0.5	6	Ethylbenzene, m & p-Xylene, 1,2,4-Trimethylbenzene, Sec-Butylbenzene, Tetrachloroethene, Bromobenzene
NBH214	0.5	7	Toluene, o-Xylene, 1,2-Dichlorobenzene, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene
NBH217	0.6	1	Di-N-Octyl Phthalate
NBH217	1.4	2	Bis(2-Ethylhexyl)Phthalate, Di-N-Octyl Phthalate

Table 20.37: Summary of CWSC Exceedances (Groundwater) in the Vicinity of Mater Station

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area			
NBH215-S	1	DWS	Ammoniacal Nitrogen as N
	1	EQS	Biological Oxygen Demand
	3	IGV	Chloride, Manganese, Total Petroleum Hydrocarbons
NBH215-D	2	DWS	Ammoniacal Nitrogen as N, Aliphatic TPH >C12-C16
	5	IGV	Chloride, Iron, Manganese, Boron, Total Petroleum Hydrocarbons
NBH216A-S	1	DWS	Aromatic TPH >C21-C35
	10	IGV	Bis(2-Ethylhexyl)Phthalate, Chloride, Benzo[g,h,i]perylene, Indeno(1,2,3-c,d)Pyrene, Fluoranthene, Benzo[a]pyrene, Manganese, Boron, Naphthalene, Total Petroleum Hydrocarbons
NBH216A-D	2	DWS	Ammoniacal Nitrogen as N, Aromatic TPH >C21-C35
	5	IGV	Chloride, Manganese, Arsenic, Boron, Total Petroleum Hydrocarbons
NBH21-S	1	DWS	Ammoniacal Nitrogen as N
	4	IGV	Nitrite, Chloride, Manganese, Boron
ABH40	1	EQS	Biological Oxygen Demand
	1	IGV	Chloride
Within 250m of Works Area			
ABH39	1	DWS	Ammoniacal Nitrogen as N
	1	IGV	Chloride
B1	1	IGV	Lead
C-D	4	DWS	Ammoniacal Nitrogen as N, Total PAH 16, Aromatic TPH >C12-C21
	2	IGV	Boron, Benzo(a)pyrene
E1-D	1	DWS	Total PAH 16
	1	IGV	Benzo(a)pyrene
E1-S	2	DWS	Total PAH 16, Aliphatic TPH >C21-C35
	1	EQS	Vanadium
	2	IGV	Benzo(a)pyrene, Benzo(g,h,i)perylene

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area			
E2	2	IGV	Boron, Nitrate
NBH217	5	IGV	Calcium, Chloride, Magnesium, Nickel, Potassium

Table 20.38: Summary of CWSC Exceedances (Leachate) in the Vicinity of Mater Station

Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area				
ABH40	9.3	1	DWS	Selenium
	9.3	1	IGV	Phenols
	29.6	1	DWS	Antimony
NBH21	1	1	IGV	Chloride
NBH215	0.5	2	DWS	Molybdenum, Selenium
	0.5	2	IGV	Chloride, Arsenic
NBH216A	0.25	1	IGV	Phenols
Within 250m of Works Area				
ABH39	23.7	1	DWS	Selenium
NBH214	0.5	1	DWS	Molybdenum
	0.5	1	IGV	pH
NBH217	0.6	2	IGV	Chloride, Chromium

20.4.7 O'Connell Street Station

Table 20.39: Summary of Soil GAC Exceedances in the O'Connell Street Station Area

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail	
Inside Works Area					
ABH45	0.5	10	1	Residential	Benzo[a]pyrene, Benzo[a]anthracene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene, Naphthalene, Aromatic TPH >C10-C12, Aromatic TPH >C12-C16, Aromatic TPH >C16-C21, Aromatic TPH >C21-C35
				Commercial	Dibenz(a,h)Anthracene
ABH45	1	6	0	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene, Naphthalene	
ABH45	5.5	1	0	Dibenz(a,h)Anthracene, Trichloroethene	
ABH45	10.5	1	0	Trichloroethene	
ABH46	1.5	1	0	Arsenic	
ABH46	2.5	1	0	Dibenz(a,h)Anthracene	
ABH46	29.8	1	0	Benzene, 1,2-Dichloroethane	
ATP47	2.2	4	0	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene	
NBH22	0.7	1	0	Chromium[1]	

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail	
NBH23A	0.5	3	0	Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene	
NBH23A	1.2	9	2	Residential	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene, Indeno(1,2,3-c,d)Pyrene, Naphthalene, Phenanthrene, Aromatic TPH >C16-C21
				Commercial	Benzo[b]fluoranthene, Dibenz(a,h)Anthracene
NBH24	0.3	1	0	Arsenic	
NBH24	1	1	0	Arsenic	
NBH304	0.5	1	0	Chromium[1]	
NBH304	1	1	0	Chromium[1]	
Within 250m of Works Area					
NBH303	0.5	2	0	Lead, Chromium[1]	
SURGE_2118	0.1	2	0	Lead, Beryllium	

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.40: Detail of Soil VOC/SVOC Detections in the O'Connell Street Station Area

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
Inside Works Area			
ABH45	0.5	3	2-Methylnaphthalene, Carbazole, Dibenzofuran
ABH45	1	2	2-Methylnaphthalene, Carbazole
ABH45	3	3	2-Methylnaphthalene, Carbazole, Dibenzofuran
ABH45	3.5	1	Toluene
ABH45	5.5	4	Trichloroethene, Trichloromethane, Tetrachloroethene, Carbazole
ABH45	10.5	2	Trichloroethene, Tetrachloroethene
ABH46	29.8	3	Benzene, Toluene, 1,2-Dichloroethane
ATP47	0.2	1	Carbazole
ATP47	2.2	3	2-Methylnaphthalene, Carbazole, Dibenzofuran
NBH23A	0.5	8	Ethylbenzene, m & p-Xylene, o-Xylene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 2-Methylnaphthalene, Carbazole, Dibenzofuran
NBH23A	1.2	3	2-Methylnaphthalene, Carbazole, Dibenzofuran
NBH304	0.5	2	1,2-Dichlorobenzene, 1,2-Dichloroethane

Table 20.41: Summary of CWSC Exceedances (Groundwater) in the Vicinity of O'Connell Street Station

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area			
NBH22-S	5	IGV	Nitrite, Chloride, Manganese, Potassium, Boron
NBH23A	1	DWS	Ammoniacal Nitrogen as N
	4	IGV	Chloride, Manganese, Potassium, Boron
NBH23W	1	DWS	Ammoniacal Nitrogen as N

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
	2	IGV	Boron, Potassium
NBH24-S	2	DWS	Phosphorus, Aromatic TPH >C21-C35
	4	IGV	Tetrachloroethene, Potassium, Boron, Total Petroleum Hydrocarbons
Within 250m of Works Area			
NBH23	1	DWS	Selenium
	2	IGV	Chloride, Total Dissolved Solids

Table 20.42: Summary of CWSC Exceedances (Leachate) in the Vicinity of O'Connell Street Station

Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area				
ABH45	0.5	1	IGV	Phenols
	3.5	1	IGV	Arsenic
	5.5	1	IGV	Phenols
ABH45A	22	1	DWS	Selenium
ABH46	1.5	2	IGV	Phenols, Arsenic
	2.5	1	IGV	Arsenic
	14	1	DWS	Selenium
	20	2	DWS	Antimony, Selenium
	29.8	1	IGV	Sulphate (2:1 Water Soluble) as SO4
ATP47	0.2	1	IGV	Copper
	2.2	1	DWS	Antimony
NBH22	0.7	3	IGV	Phenols, Chromium, pH
NBH23A	0.5	2	IGV	Sulphate (2:1 Water Soluble) as SO4, pH
NBH304	0.5	1	IGV	pH
Within 250m of Works Area				
NBH302	0.5	1	IGV	Fluoride

20.4.8 Tara Station

Table 20.43: Summary of Soil GAC Exceedances in the Tara Station Area

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail
Inside Works Area				
ABH49	0.35	1	0	Arsenic
ABH49	0.85	2	0	Lead, Mercury
ABH49	3	2	0	Lead, Mercury
ABH50	1.5	2	0	Lead, Mercury
ABH50	2	3	0	Dibenz(a,h)Anthracene, Arsenic, Lead
NBH25	1.2	3	0	Arsenic, Lead, Mercury
NBH26CA	1	2	0	Arsenic, Lead
NBH27	1	3	0	Arsenic, Lead, Mercury
NBH64	1	3	0	Arsenic, Lead, Mercury
Within 250m of Works Area				
ABH48	0.5	2	0	Dibenz(a,h)Anthracene, Lead
ABH48	2	2	0	Lead, Arsenic
BH08 (WIMTEC)	2	2	0	Chromium[1], Lead
MGI/BH/715	1	1	0	Naphthalene
MGI/BH/715	11	1	0	Chromium[1]
MGI/BH/716	10.46	1	0	Chromium[1]
MGI/BH/718	1	1	0	Lead
SURGE_4197	0.1	1	0	Lead
SURGE_4200	0.1	8	0	Benzo[a]pyrene, Lead, Arsenic, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Benzo[a]anthracene, Mercury, Beryllium
SURGE_4201	0.1	1	0	Mercury

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.44: Detail of Asbestos Detections in the Tara Station Area

Exploratory Location	Sample Depth (m)	Asbestos Detected	Detail
Within 250m of Works Area			
ABH48	0.5	Chrysotile	0.086%

Table 20.45: Detail of Soil VOC/SVOC Detections in the Tara Station Area

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
Inside Works Area			
ABH50	1.5	1	Carbazole
NBH64	1	1	2-Methylnaphthalene
Within 250m of Works Area			
ABH48	0.5	1	Tetrachloroethene
MGI/BH/715	1	5	Tetrachloroethene, Bromodichloromethane, 2-Methylnaphthalene, Carbazole, Dibenzofuran
MGI/BH/715	11	1	Bis(2-Ethylhexyl)Phthalate
MGI/BH/718	1	1	Tetrachloroethene
MGI/BH/718	3.65	9	Benzene, m & p-Xylene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, Tetrachloroethene, N-Butylbenzene, N-Propylbenzene, 4-Chlorotoluene, Bromodichloromethane

Table 20.46: Summary of CWSC Exceedances (Groundwater) in the Vicinity of Tara Station

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
NBH25-S	1	DWS	Ammoniacal Nitrogen as N
	1	EQS	Cobalt
	11	IGV	Chloride, Magnesium, Manganese, Nickel, Potassium, Sodium, Barium, Boron, Calcium, Total Dissolved Solids, Sulphate
NBH26CA	2	DWS	Phosphorus, Ammoniacal Nitrogen as N
	11	IGV	Chloride, Iron, Magnesium, Manganese, Potassium, Sodium, Barium, Boron, Calcium, Total Dissolved Solids, Sulphate
NBH26CW	2	DWS	Phosphorus, Ammoniacal Nitrogen as N
	1	EQS	Biological Oxygen Demand
	11	IGV	Chloride, Iron, Magnesium, Manganese, Potassium, Sodium, Barium, Boron, Calcium, Total Dissolved Solids, Sulphate
NBH64	1	DWS	Phosphorus
	3	IGV	Potassium, Boron, Calcium

Table 20.47: Summary of CWSC Exceedances (Leachate) in the Vicinity of Tara Station

Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area				
ABH49	0.35	1	IGV	Arsenic
	0.85	1	DWS	Antimony
	0.85	2	IGV	Sulphate (2:1 Water Soluble) as SO4, Total Dissolved Solids
	3	2	DWS	Molybdenum, Antimony
	3	1	IGV	Chloride
	4.5	1	IGV	Chloride
	17.7	1	DWS	Antimony
	17.7	1	IGV	Arsenic
ABH50	1.5	1	IGV	Fluoride
	2	1	DWS	Antimony
	3	1	DWS	Antimony
	3	1	IGV	Arsenic
	6	1	DWS	Antimony
	6	1	IGV	Chloride

Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
	8.3	1	IGV	Arsenic
	13.5	1	DWS	Antimony
	23.5	2	DWS	Antimony, Selenium
NBH26CA	1	1	DWS	Molybdenum
NBH27	1	1	DWS	Antimony
	1	1	IGV	Chloride
NBH64	1	1	DWS	Antimony
	1	1	IGV	Arsenic
Within 250m of Works Area				
ABH48	0.5	1	DWS	Antimony
	0.5	1	IGV	Lead
	4.5	1	IGV	Chloride
	7.9	1	IGV	Chloride

20.4.9 St Stephen's Green Station

Table 20.48: Summary of Soil GAC Exceedances in the St Stephen's Green Station Area

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail	
Inside Works Area					
NBH219B	0.5	9	1	Residential	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene, Naphthalene, Aromatic TPH >C16-C21, Aromatic TPH >C21-C35, Lead
				Commercial	Dibenz(a,h)Anthracene
ABH52	0.45	2	0	Benzo[b]fluoranthene, Dibenz(a,h)Anthracene	
ABH52	1	3	0	Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene	
ABH53	4	4	0	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene	
ABH53	7.1	2	0	Benzo[b]fluoranthene, Dibenz(a,h)Anthracene	
ABH53	22.4	1	0	Nickel	
ABH54	0.5	1	0	Dibenz(a,h)Anthracene	
ABH54	31	2	0	Nickel, Cadmium	
ATP51WS	0.5	4	0	Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Lead	
Within 250m of Works Area					
NBH220	0.5	2	0	Dibenz(a,h)Anthracene, Lead	
SURGE_2015	0.1	3	0	Lead, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene	

Notes
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table

Table 20.49: Detail of VOC/SVOC Detections in the St Stephen's Green Station Area

Exploratory Location	Sample Depth (m)	No. of VOCs / SVOCs >LOD	Detail
Inside Works Area			
NBH219B	0.5	3	2-Methylnaphthalene, Carbazole, Dibenzofuran
Within 250m of Works Area			
NBH220	0.5	1	Toluene
NBH220	1.2	1	Toluene

Table 20.50: Summary of CWSC Exceedances (Groundwater) in the Vicinity of St Stephen's Green Station

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
NBH219B-S	4	IGV	Iron, Manganese, Potassium, Boron
NBH219B-D	5	IGV	Chloride, Iron, Manganese, Boron, Total Petroleum Hydrocarbons
ABH53	1	DWS	Ammoniacal Nitrogen as N
	1	IGV	Chloride

Table 20.51: Summary of CWSC Exceedances (Leachate) in the Vicinity of St Stephen's Green Station

Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area				
NBH219	0.5	1	DWS	Molybdenum
	0.5	2	IGV	Mercury, Arsenic
NBH219B	0.5	2	DWS	Molybdenum, Antimony
ABH52	4.5	1	DWS	Selenium
ABH52	7.7	1	DWS	Selenium
ABH52	21.5	1	DWS	Anitmony
ABH52	25.5	1	DWS	Anitmony
		1	IGV	Barium
ABH53	22.4	1	DWS	Anitmony
ABH54	9	1	DWS	Anitmony
ABH54	19	1	DWS	Anitmony
ABH54	31	1	IGV	Barium
ATP51WS	0.5	1	IGV	Fluoride
Within 250m of Works Area				
ABH55	23	1	DWS	Antimony
NBH107	0.5	1	IGV	pH
NBH220	0.5	1	IGV	Chloride

20.4.10 Charlemont Station

Table 20.52: Summary of Soil GAC Exceedances in the Charlemont Station Area

Exploratory Location	Sample Depth (m)	No. of Residential GAC Exceedances	No. of Commercial GAC Exceedances	Detail	
Inside Works Area					
ABH57	5.5	2	0	Arsenic, Nickel	
ATP55	1	2	0	Arsenic, Lead	
NBH29	0.5	1	0	Chromium[1]	
NBH30	0.5	4	0	Arsenic, Chromium[1], Lead, Mercury	
NBH31	1	3	0	Arsenic, Chromium[1], Lead	
Within 250m of Works Area					
NBH222B	0.3	9	1	Residential	Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Chrysene, Dibenz(a,h)Anthracene, Naphthalene, Aromatic TPH >C16-C21, Aromatic TPH >C21-C35, Aromatic TPH >C35-C44
				Commercial	Dibenz(a,h)Anthracene
NBH222B	0.6	5	0	Benzo[a]pyrene, Benzo[b]fluoranthene, Dibenz(a,h)Anthracene, Lead, Mercury	
SURGE_2003	0.1	2	0	Lead, Beryllium	

Notes
1 - Chromium (Hexavalent) not tested - most conservative assessment criteria used.
Results reported below Laboratory Method Detection Limit (MDL) but greater than GAC are not presented in this table.

Table 20.53: Detail of Soil VOC/SVOC Detections in the Charlemont Station Area

Exploratory Location	Sample Depth (m)	No. of VOCs/SVOCs >LOD	Detail
Inside Works Area			
NBH30	0.5	1	1,2,4-trichlorobenzene
Within 250m of Works Area			
NBH222B	0.3	1	Carbazole

Table 20.54: Summary of CWSC Exceedances (Groundwater) in the Vicinity of Charlemont Station

Exploratory Location	No. of GAC Exceedances	Criteria Source	Details of Exceedances
NBH30W	1	IGV	Chloride
NBH31	1	DWS	Ammoniacal Nitrogen as N
	5	IGV	Nitrite, Chloride, Manganese, Boron, Potassium
ABH59	1	DWS	Ammoniacal Nitrogen as N
	5	IGV	Chloride, Potassium

Table 20.55: Summary of CWSC Exceedances (Leachate) in the Vicinity of Charlemont Station

Exploratory Location	Sample Depth (m)	No. of GAC Exceedances	Criteria Source	Details of Exceedances
Inside Works Area				
ABH56	25.5	1	DWS	Antimony
ABH57	2.4	1	DWS	Selenium
	4.5	1	DWS	Selenium
	5.5	2	DWS	Antimony, Selenium
	15.5	1	DWS	Antimony
ABH58	28.5	2	DWS	Antimony, Selenium
ABH59	22.2	1	DWS	Antimony
NBH29	0.5	1	IGV	Chloride
NBH31	1	1	DWS	Antimony
Within 250m of Works Area				
NBH110	0.5	5	IGV	Mercury, Barium, Chromium, Total Dissolved Solids, pH
NBH222	0.3	1	DWS	Antimony
	0.3	1	IGV	pH