S4UL - PAHs (Residential with Homegrown Produce), Sandford Park, January 2020

	CBR01	CBR02	CBR03	CBR04	CBR06	CBR07	CBR08	CBR09	CBR10	WS01	Max Level Detected	Units	Residential with homegrown produce LQM/CIEH Suitable 4 Use Levels (S4ULs) [mg/kg DW]		
	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7			1 % SOM	2.5 % SOM	6 % SOM
Naphthalene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2.3	5.6	13
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	170	420	920
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	210	510	1,100
Fluorene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	170	400	860
Phenanthrene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.16	0.16	mg/kg	95	220	440
Anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.06	0.06	mg/kg	2,400	5,400	11,000
Fluoranthene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.25	0.25	mg/kg	280	560	890
Pyrene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.22	0.22	mg/kg	620	1,200	2,000
Benzo(a)anthracene	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.13	0.13	mg/kg	7.2	11	13
Chrysene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.11	0.11	mg/kg	15	22	27
Benzo(bk)fluoranthene	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.21	0.21	mg/kg	ne	ne	ne
Benzo(a)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.1	0.10	mg/kg	2.2	2.7	3
Indeno(123cd)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.08	0.08	mg/kg	27	36	41
Dibenzo(ah)anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	0.24	0.28	0.3
Benzo(ghi)perylene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.08	0.08	mg/kg	320	340	350
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	ne	ne	ne
PAH 6 Total	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.72	0.72	mg/kg	ne	ne	ne
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	1.4	1.40	mg/kg	ne	ne	ne
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.15	0.15	mg/kg	2.6	3.3	3.7
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.06	mg/kg	77	93	100
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.00	mg/kg	ne	ne	ne
TOC	0.86	0.8	0.68	0.65	0.65	0.49	0.81	1.01	0.79	0.43		%			
SOM (Note 1)	1.48	1.38	1.17	1.12	1.12	0.84	1.40	1.74	1.36	0.74					

Note 1 - TOC * 1.724

S4UL - PAHs (Residential with Homegrown Produce), Sandford Park, January 2020

	WS01	WS01	WS02	WS02	WS02	WS03	WS03	WS03	WS04	WS04	Max Level Detected	Units	Residential with homegrown produce LQM/CIEH Suitable 4 Use Levels (S4ULs) [mg/kg DW]		
	1.7	2.4	0.7	1.7	2.5	0.7	1.7	2.7	0.7	1.7			1 % SOM	2.5 % SOM	6 % SOM
Naphthalene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2.3	5.6	13
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	170	420	920
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	210	510	1,100
Fluorene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	170	400	860
Phenanthrene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	95	220	440
Anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2,400	5,400	11,000
Fluoranthene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	280	560	890
Pyrene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	620	1,200	2,000
Benzo(a)anthracene	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.00	mg/kg	7.2	11	13
Chrysene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.00	mg/kg	15	22	27
Benzo(bk)fluoranthene	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.00	mg/kg	ne	ne	ne
Benzo(a)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2.2	2.7	3
Indeno(123cd)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	27	36	41
Dibenzo(ah)anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	0.24	0.28	0.3
Benzo(ghi)perylene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	320	340	350
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	ne	ne	ne
PAH 6 Total	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.00	mg/kg	ne	ne	ne
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	0.00	mg/kg	ne	ne	ne
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	2.6	3.3	3.7
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.00	mg/kg	77	93	100
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.00	mg/kg	ne	ne	ne
TOC	0.35	0.37	0.48	0.4	0.39	0.37	0.33	0.49	0.37	0.38		%			
SOM (Note 1)	0.60	0.64	0.83	0.69	0.67	0.64	0.57	0.84	0.64	0.66					

Note 1 - TOC * 1.724

S4UL - PAHs (Residential with Homegrown Produce), Sandford Park, January 2020

	WS05	WS05	WS06	WS06	WS07	WS07	WS07	WS08	WS08	WS08	Max Level	Units	Residential with homegrown produce		
													LQM/CIEH Suitable 4 Use Levels (S4ULs) [mg/kg DW]		
	0.7	1.7	0.7	1.7	0.7	1.7	2.6	0.7	1.7	2.6	Detected		1 % SOM	2.5 % SOM	6 % SOM
Naphthalene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2.3	5.6	13
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	170	420	920
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	210	510	1,100
Fluorene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	170	400	860
Phenanthrene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	95	220	440
Anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2,400	5,400	11,000
Fluoranthene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	280	560	890
Pyrene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	620	1,200	2,000
Benzo(a)anthracene	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.00	mg/kg	7.2	11	13
Chrysene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.00	mg/kg	15	22	27
Benzo(bk)fluoranthene	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.00	mg/kg	ne	ne	ne
Benzo(a)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2.2	2.7	3
Indeno(123cd)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	27	36	41
Dibenzo(ah)anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	0.24	0.28	0.3
Benzo(ghi)perylene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	320	340	350
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	ne	ne	ne
PAH 6 Total	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.00	mg/kg	ne	ne	ne
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	0.00	mg/kg	ne	ne	ne
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	2.6	3.3	3.7
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.00	mg/kg	77	93	100
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.00	mg/kg	ne	ne	ne
TOC	0.38	0.4	0.55	0.37	0.32	0.41	0.61	0.44	0.36	0.69		%			
SOM (Note 1)	0.66	0.69	0.95	0.64	0.55	0.71	1.05	0.76	0.62	1.19					

Note 1 - TOC * 1.724

S4UL - PAHs (Residential with Homegrown Produce), Sandford Park, January 2020

													Residential with homegrown produce		
	WS09	WS09	WS09	WS10	WS10	WS10	WS11	WS11	WS11	WS12	Max Level	Units	LQM/CIEH Suitable 4 Use Levels (S4ULs) [mg/kg DW]		
	0.7	1.7	2.6	0.7	1.7	2.3	0.7	1.7	2.2	0.7	Detected		1 % SOM	2.5 % SOM	6 % SOM
Naphthalene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2.3	5.6	13
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	170	420	920
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	210	510	1,100
Fluorene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	170	400	860
Phenanthrene	<0.03	<0.03	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	mg/kg	95	220	440
Anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2,400	5,400	11,000
Fluoranthene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	280	560	890
Pyrene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	620	1,200	2,000
Benzo(a)anthracene	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.00	mg/kg	7.2	11	13
Chrysene	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	mg/kg	15	22	27
Benzo(bk)fluoranthene	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.00	mg/kg	ne	ne	ne
Benzo(a)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2.2	2.7	3
Indeno(123cd)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	27	36	41
Dibenzo(ah)anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	0.24	0.28	0.3
Benzo(ghi)perylene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	320	340	350
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	ne	ne	ne
PAH 6 Total	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.00	mg/kg	ne	ne	ne
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	0.00	mg/kg	ne	ne	ne
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	2.6	3.3	3.7
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.00	mg/kg	77	93	100
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.00	mg/kg	ne	ne	ne
TOC	0.38	0.4	0.69	0.37	0.37	0.49	0.39	0.36	0.3	1.06		%			
SOM (Note 1)	0.66	0.69	1.19	0.64	0.64	0.84	0.67	0.62	0.52	1.83					

Note 1 - TOC * 1.724

S4UL - PAHs (Residential with Homegrown Produce), Sandford Park, January - March 2020

	WS12	WS12	WS13	WS13	WS14	WS14	WS14	BH03	BH04	BH05	Max Level Detected	Units	Residential with homegrown produce LQM/CIEH Suitable 4 Use Levels (S4ULs) [mg/kg DW]		
	1.7	2.5	0.7	1.4	0.7	1.7	2.7	3	3	3			1 % SOM	2.5 % SOM	6 % SOM
Naphthalene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2.3	5.6	13
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	170	420	920
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	210	510	1,100
Fluorene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	170	400	860
Phenanthrene	<0.03	0.06	<0.03	<0.03	<0.03	<0.03	0.05	<0.03	<0.03	<0.03	0.06	mg/kg	95	220	440
Anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2,400	5,400	11,000
Fluoranthene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	280	560	890
Pyrene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	620	1,200	2,000
Benzo(a)anthracene	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.00	mg/kg	7.2	11	13
Chrysene	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.03	mg/kg	15	22	27
Benzo(bk)fluoranthene	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.00	mg/kg	ne	ne	ne
Benzo(a)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2.2	2.7	3
Indeno(123cd)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	27	36	41
Dibenzo(ah)anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	0.24	0.28	0.3
Benzo(ghi)perylene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	320	340	350
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	ne	ne	ne
PAH 6 Total	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.00	mg/kg	ne	ne	ne
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	0.00	mg/kg	ne	ne	ne
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	2.6	3.3	3.7
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.00	mg/kg	77	93	100
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.00	mg/kg	ne	ne	ne
TOC	0.35	0.66	0.32	0.37	0.36	0.34	0.69	0.54	0.57	0.63		%			
SOM (Note 1)	0.60	1.14	0.55	0.64	0.62	0.59	1.19	0.93	0.98	1.09					

Note 1 - TOC * 1.724

S4UL - PAHs (Residential with Homegrown Produce), Sandford Park, January - March 2020

	BH06	BH07	BH08	BH09	BH10	BH11	BH12	Max Level Detected	Units	Residential with homegrown produce LQM/CIEH Suitable 4 Use Levels (S4ULs) [mg/kg DW]		
	3	3	3	3	3	3	3			1 % SOM	2.5 % SOM	6 % SOM
Naphthalene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2.3	5.6	13
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	170	420	920
Acenaphthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	210	510	1,100
Fluorene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	170	400	860
Phenanthrene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	95	220	440
Anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2,400	5,400	11,000
Fluoranthene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	280	560	890
Pyrene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.00	mg/kg	620	1,200	2,000
Benzo(a)anthracene	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.00	mg/kg	7.2	11	13
Chrysene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.00	mg/kg	15	22	27
Benzo(bk)fluoranthene	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.00	mg/kg	ne	ne	ne
Benzo(a)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	2.2	2.7	3
Indeno(123cd)pyrene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	27	36	41
Dibenzo(ah)anthracene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	0.24	0.28	0.3
Benzo(ghi)perylene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	320	340	350
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.00	mg/kg	ne	ne	ne
PAH 6 Total	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.00	mg/kg	ne	ne	ne
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	0.00	mg/kg	ne	ne	ne
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.00	mg/kg	2.6	3.3	3.7
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.00	mg/kg	77	93	100
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	0.00	mg/kg	ne	ne	ne
TOC	0.67	0.71	0.63	0.63	0.68	0.66	0.98		%			
SOM (Note 1)	1.16	1.22	1.09	1.09	1.17	1.14	1.69					

Note 1 - TOC * 1.724

APPENDIX 10 – Potential Material Outlets

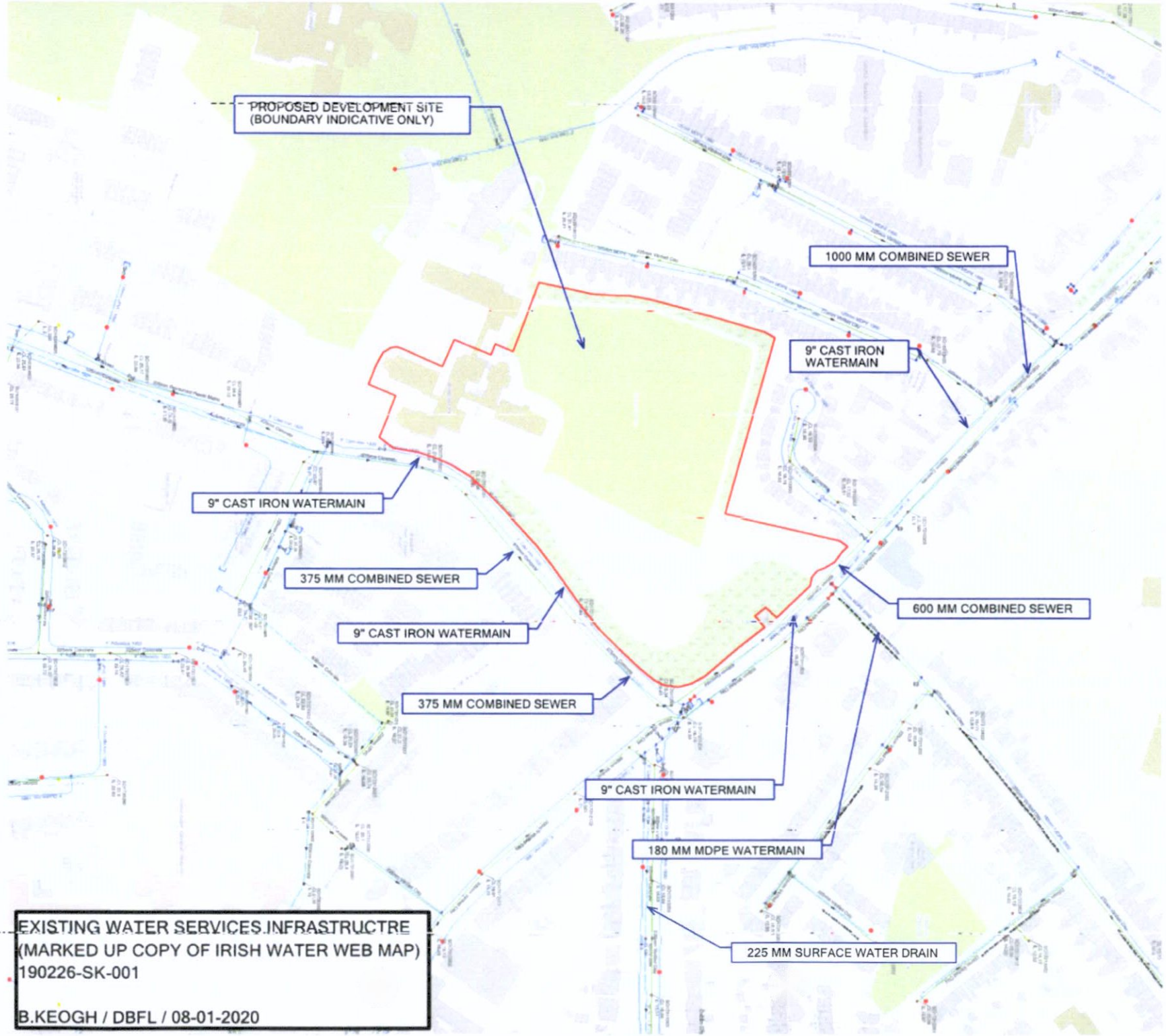
Waste Category	Classification Criteria	Potential Outlets
Category A Unlined Soil Recovery Facilities	Soil and Stone only which are free from[12] anthropogenic materials such as concrete, brock timber. Soil must be free from "contamination" e.g. PAHs, Hydrocarbons.	Soil Recovery Facilities, Waste Facility Permitted Sites, COR Sites or potential by-product if deemed not to be a waste and complying with requirements under Article 27 of European Waste Directive Regulations (2011).[13]
Category B1 Inert Landfill	Reported concentrations within inert waste limits, which are set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results also found to be non-hazardous using the HWOL application.	Integrated Materials Solutions Limited Partnership (IMS), Naul, County Dublin W0129-02 Walshestown Landfill Walshestown, Blackhall, Tipperkevin & Bawnoge, Naas, County Kildare W0254-01
Category B2 Inert Landfill	Reported concentrations greater than Category B1 criteria but less than IMS Hollywood Landfill acceptance criteria, as set out in their Waste Licence W0129-02. Results also found to be non-hazardous using the HWOL application*	Integrated Materials Solutions Limited Partnership (IMS), Naul, County Dublin W0129-02 Walshestown Landfill Walshestown, Blackhall, Tipperkevin & Bawnoge, Naas, County Kildare W0254-01[14]
Category C Non-Haz Landfill	Reported concentrations greater than Category B2 criteria but within non-haz landfill waste acceptance limits set out by the adopted EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). Results also found to be non-hazardous using the HWOL application.	Walshestown Landfill Walshestown, Blackhall, Tipperkevin & Bawnoge, Naas, County Kildare W0254-01[15] Ballynagran Landfill, Co. Wicklow. W165-02 Drehid Landfill, Co. Kildare. W0201-01 East Galway Landfill, Co. Galway. W0178-02 Knockharley Landfill, Co. Meath. W0146-02
Category C 1 Non-Haz Landfill	As Category C but containing < 0.001% w/w asbestos fibres.	RILTA Environmental LTD. W0192-03 Enva Portlaoise.

[12] Free from equates to less than 2%.
[13] S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011 (Article 27).
[14] Licenced to accept Category B2 material for recovery.
[15] Licenced to accept Category C material for recovery.

		W0184-02
Category C 2 Non-Haz Landfill	As Category C but containing >0.001% and <0.01% w/w asbestos fibres	RILTA Environmental LTD. W0192-03 Enva Portlaoise. W0184-02
Category C Non-Haz Landfill	As Category C but containing >0.01% and <0.1% w/w asbestos fibres.	RILTA Environmental LTD. W0192-03 Enva Portlaoise. W0184-02
Category D Hazardous Treatment	Results found to be hazardous using HWOL Application.	RILTA Environmental LTD. W0192-03 Enva Portlaoise. W0184-02
Category D 1 Hazardous Treatment	Results found to be hazardous due to the presence of asbestos (>0.1%).	RILTA Environmental LTD. W0192-03

APPENDIX 11.1

EXISTING IRISH WATER SERVICES INFRASTRUCTURE



EXISTING WATER SERVICES INFRASTRUCTRE
(MARKED UP COPY OF IRISH WATER WEB MAP)
190226-SK-001

B.KEOGH / DBFL / 08-01-2020

APPENDIX 11.2

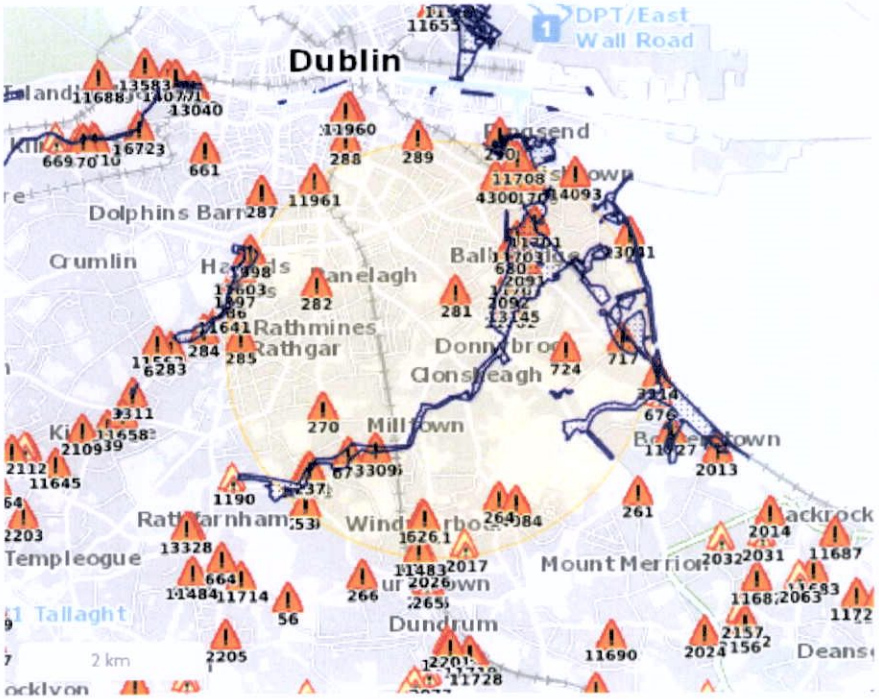
FLOOD HAZARD INFORMATION

Past Flood Event Local Area Summary Report

OPW Oifig na nOibreacha Poibli Office of Public Works

Report Produced: 6/12/2022 16:48

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

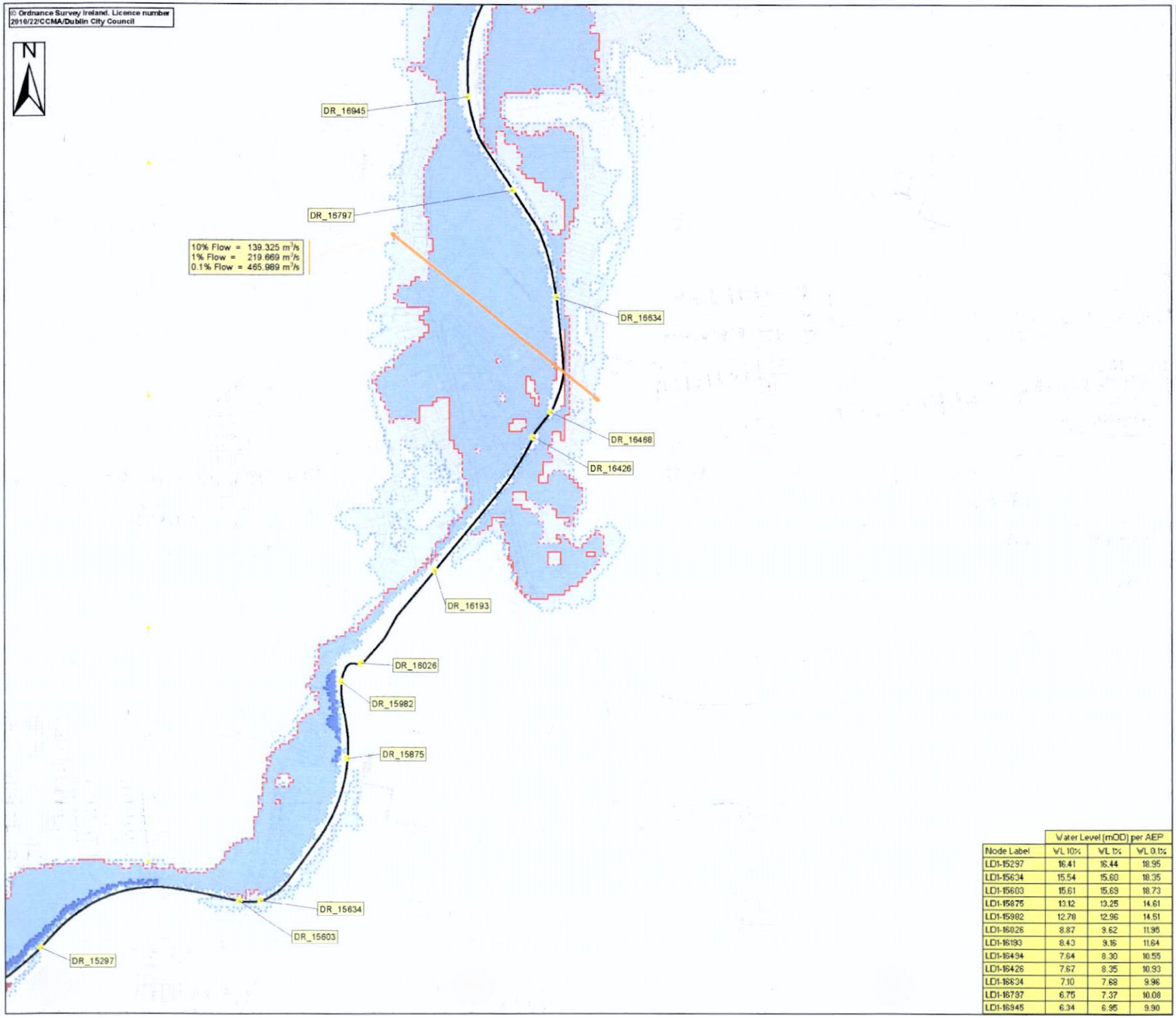
54 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Dodder Oct 1987 (ID-680)	20/10/1987	Approximate Point
	Additional Information: Reports (3) Press Archive (0)		
2.	Poddle August 1986 (ID-32)	24/08/1986	Area
	Additional Information: Reports (9) Press Archive (1)		
3.	Dodder Ballsbridge Sept 1931 (ID-2091)	02/09/1931	Approximate Point
	Additional Information: Reports (8) Press Archive (7)		
4.	Dodder Anglesea Road Dec 1958 (ID-2092)	18/12/1958	Approximate Point
	Additional Information: Reports (7) Press Archive (0)		
5.	Dodder Classon's Bridge Nov 2000 (ID-3309)	05/11/2000	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
6.	Bath Avenue June 1963 (ID-4300)	10/06/1963	Exact Point
	Additional Information: Reports (4) Press Archive (0)		

	Name (Flood_ID)	Start Date	Event Location
	Nutley Elm Park Streams June 1963 (ID-118) Additional Information: Reports (14) Press Archive (20)	10/06/1963	Area
8.	Dodder August 1986 (ID-1) Additional Information: Reports (21) Press Archive (18)	25/08/1986	Area
9.	Slang River 24th Oct 2011 Frankfort (ID-11483) Additional Information: Reports (1) Press Archive (0)	23/10/2011	Approximate Point
10.	Little Dargle Sept 1931 (ID-53) Additional Information: Reports (4) Press Archive (0)	02/09/1931	Approximate Point
11.	Dodder Sept 1931 (ID-237) Additional Information: Reports (9) Press Archive (3)	02/09/1931	Approximate Point
12.	Little Dargle Dec 1956 (ID-259) Additional Information: Reports (3) Press Archive (0)	25/12/1956	Approximate Point
13.	Roebuck June 1963 (ID-264) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
14.	Rathgar June 1963 (ID-270) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
15.	Dodder Donnybrook June 1963 (ID-281) Additional Information: Reports (4) Press Archive (3)	10/06/1963	Exact Point
16.	Rathmines Lower June 1963 (ID-282) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
17.	Harold's Cross June 1963 (ID-285) Additional Information: Reports (4) Press Archive (2)	10/06/1963	Exact Point
18.	Flooding at Roebuck Road on 21/08/2021 (ID-14084) Additional Information: Reports (0) Press Archive (0)	21/08/2021	Approximate Point
19.	Dundrum River Sept 1957 (ID-626) Additional Information: Reports (1) Press Archive (0)	23/09/1957	Exact Point
20.	Dodder August 1905 (ID-657) Additional Information: Reports (5) Press Archive (4)	24/08/1905	Approximate Point
21.	Dodder August 1946 (ID-658) Additional Information: Reports (7) Press Archive (2)	10/08/1946	Approximate Point
22.	Dodder October 1886 (ID-659) Additional Information: Reports (4) Press Archive (2)	16/10/1886	Approximate Point
23.	Dodder August 1912 (ID-660) Additional Information: Reports (5) Press Archive (0)	26/08/1912	Approximate Point
24.	Dodder Dartry Cottages Nov 2000 (ID-673) Additional Information: Reports (3) Press Archive (0)	05/11/2000	Approximate Point

	Name (Flood_ID)	Start Date	Event Location
25.	Booterstown/Ailesbury Park November 1965 (ID-717) Additional Information: Reports (1) Press Archive (0)	17/11/1965	Approximate Point
26.	Nutley Stream June 1989 (ID-724) Additional Information: Reports (1) Press Archive (0)	13/06/1989	Exact Point
27.	Dodder Sept 1957 (ID-731) Additional Information: Reports (5) Press Archive (0)	23/09/1957	Approximate Point
28.	Dodder November 1968 (ID-1231) Additional Information: Reports (2) Press Archive (0)	01/11/1968	Approximate Point
29.	Dodder 24th Oct 2011 Waldron's Br (ID-11482) Additional Information: Reports (1) Press Archive (0)	23/10/2011	Approximate Point
30.	Dodder Oct 1880 (ID-1228) Additional Information: Reports (2) Press Archive (0)	27/10/1880	Approximate Point
31.	Dodder October 1891 (ID-1229) Additional Information: Reports (3) Press Archive (0)	19/10/1891	Approximate Point
32.	Dodder November 1898 (ID-1230) Additional Information: Reports (2) Press Archive (0)	23/11/1898	Approximate Point
33.	Dodder November 1901 (ID-1232) Additional Information: Reports (2) Press Archive (0)	10/11/1901	Approximate Point
34.	Dodder November 1915 (ID-1233) Additional Information: Reports (3) Press Archive (0)	11/11/1915	Approximate Point
35.	Dodder September 1883 (ID-1234) Additional Information: Reports (2) Press Archive (0)	03/09/1883	Approximate Point
36.	Dodder December 1956 (ID-1235) Additional Information: Reports (2) Press Archive (0)	29/12/1956	Approximate Point
37.	Larchfield Estate Recurring (ID-2017) Additional Information: Reports (5) Press Archive (0)	n/a	Exact Point
38.	Dodder Orwell Gardens Nov 1965 (ID-3342) Additional Information: Reports (10) Press Archive (0)	17/11/1965	Approximate Point
39.	Flooding at Ballsbridge on 14/11/2014 (ID-13145) Additional Information: Reports (0) Press Archive (0)	14/11/2014	Approximate Point
40.	Dublin City Tidal Feb 2002 (ID-456) Additional Information: Reports (45) Press Archive (27)	01/02/2002	Area
41.	Flooding at Bath Avenue, Sandymount, Dublin 4 on 24th Oct 2011 (ID-11706) Additional Information: Reports (1) Press Archive (0)	23/10/2011	Exact Point
42.	Flooding at Anglesea Road, Ballsbridge, Dublin 4 on 24th Oct 2011 (ID-11702)	23/10/2011	Exact Point

	Name (Flood_ID)	Start Date	Event Location
	Additional Information: Reports (1) Press Archive (0)		
43.	Flooding at Herbert Cottages, Ballsbridge, Dublin 4 on 24th Oct 2011 (ID-11703)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
44.	Flooding at Milltown, Dublin 6 on 24th Oct 2011 (ID-11705)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
45.	Flooding at RDS, Ballsbridge, Dublin 4 on 24th Oct 2011 (ID-11707)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
46.	Flooding at Havelock Square, Sandymount, Dublin 4 on 24th Oct 2011 (ID-11725)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
47.	Little Dargle Feb 1958 (ID-60)	10/02/1958	Approximate Point
	Additional Information: Reports (2) Press Archive (0)		
48.	Dodder Lr Dodder Road Orwell Gardens Dec 1958 (ID-77)	18/12/1958	Approximate Point
	Additional Information: Reports (7) Press Archive (0)		
49.	Dodder Anglesea Road Nov 1965 (ID-238)	17/11/1965	Approximate Point
	Additional Information: Reports (11) Press Archive (10)		
50.	Dodder Dec 2003 (ID-349)	02/12/2003	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
51.	Flooding at Railway Cottages, Ballsbridge, Dublin 4 on 24th Oct 2011 (ID-11701)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
52.	Slang Frankfort August 1986 (ID-1267)	24/08/1986	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
53.	Flooding at ESB Sportsco, Ringsend, Dublin 4 on 24th Oct 2011 (ID-11708)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
54.	Flooding at Dundrum, Dublin 14 on 24th Oct 2011 (ID-11711)	23/10/2011	Exact Point
	Additional Information: Reports (1) Press Archive (0)		



Node Label	Water Level (mOD) per AEP		
	WL 10%	WL 1%	WL 0.1%
LDI-15297	16.41	16.44	16.95
LDI-15634	15.54	15.60	16.35
LDI-15603	15.61	15.69	16.73
LDI-15875	13.12	13.25	14.61
LDI-15982	12.78	12.96	14.51
LDI-16026	8.87	9.62	11.95
LDI-16193	8.43	9.16	11.64
LDI-16494	7.64	8.30	10.55
LDI-16426	7.67	8.35	10.93
LDI-16634	7.10	7.68	9.96
LDI-16797	6.75	7.37	10.08
LDI-16945	6.34	6.95	9.90

Location Plan:

Legend:

- 10 % AEP Flood Extent (1 in 10 chance in any given year)
- 1 % AEP Flood Extent (1 in 100 chance in any given year)
- 0.1 % AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- High Confidence (<20m) (10% AEP)
- Medium Confidence (<40m) (10% AEP)
- Low Confidence (>40m) (10% and 0.1% AEP)
- High Confidence (<20m) (1% AEP)
- Medium Confidence (<40m) (1% AEP)
- Low Confidence (>40m) (1% AEP)
- River Centreline
- Node Point
- OS_2975 Node Label (refer to table)
- Flow reporting location
- 10% Flow = 1.20 1% Flow = 1.55 0.1% Flow = 2.17 Peak flow during design flood extent

USER NOTE

USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION, LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME. IF THIS MAP DOES NOT FORM PART OF BOUND VOLUME, IT SHOULD NOT BE USED FOR ANY PURPOSE.

Client:

Project:
DODDER CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT STUDY

Map:
PRESENT DAY DODDER

Map Type: FLOOD EXTENT
Source: FLUVIAL FLOODING
Map Area: URBAN AREA
Scenario: CURRENT

Drawn By : A.A.B Date : 26 November 2010
Checked By : A.J. Date : 26 November 2010
Approved By : A.G.B Date : 26 November 2010

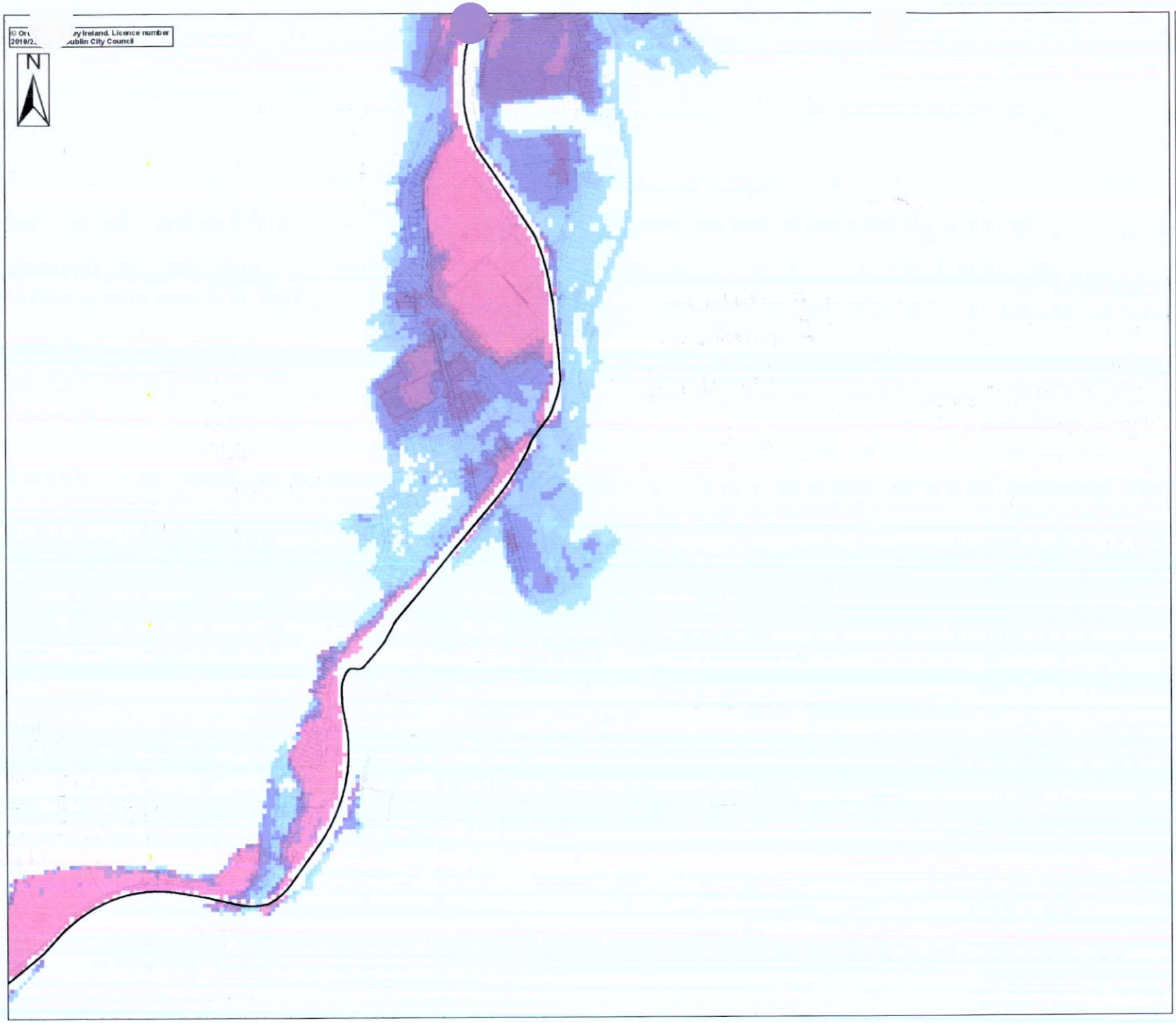
Figure No. :
DR/EXT/UA/CURS/101

Map Series : Page 8 of 12

Drawing Scale : 1: 5,000 Plot Scale : 1:1 @ A3

0 0.1 0.2
Kilometers

RPS Consulting Engineers
ELMWOOD HOUSE
74 BOUCHER ROAD
BELFAST BT12 6RZ
T: 066 7914
F: 066 8286
W: jup.com/ireland



Location Plan:

Legend:

Depth Grid [m]

- 0 - 0.25 m
- 0.25 - 0.50 m
- 0.50 - 1.00 m
- 1.00 - 1.50 m
- 1.5 - 2.00 m
- > 2.00 m
- River Centreline

USER NOTE

USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION, LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME. IF THIS MAP DOES NOT FORM PART OF BOUND VOLUME, IT SHOULD NOT BE USED FOR ANY PURPOSE.

Client:

South Dublin County Council

OPW

Project:

DODDER CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT STUDY

Map:

DODDER

Map Type:	DEPTH
Return Period:	0.1% AEP EVENT
Source:	FLUVIAL FLOODING
Map Area:	URBAN AREA
Scenario:	CURRENT

Drawn By :	A.A.B	Date : 26 November 2010
Checked By :	A.J.	Date : 26 November 2010
Approved By :	A.G.B	Date : 26 November 2010

Figure No. :

DR/EXT/UA/DEP/1000/101A

Map Series : Page 8 of 12

Drawing Scale : 1: 5,000 Plot Scale : 1:1 @ A3

0 0.1 0.2
Kilometers

RPS Consulting Engineers
ELMWOOD HOUSE
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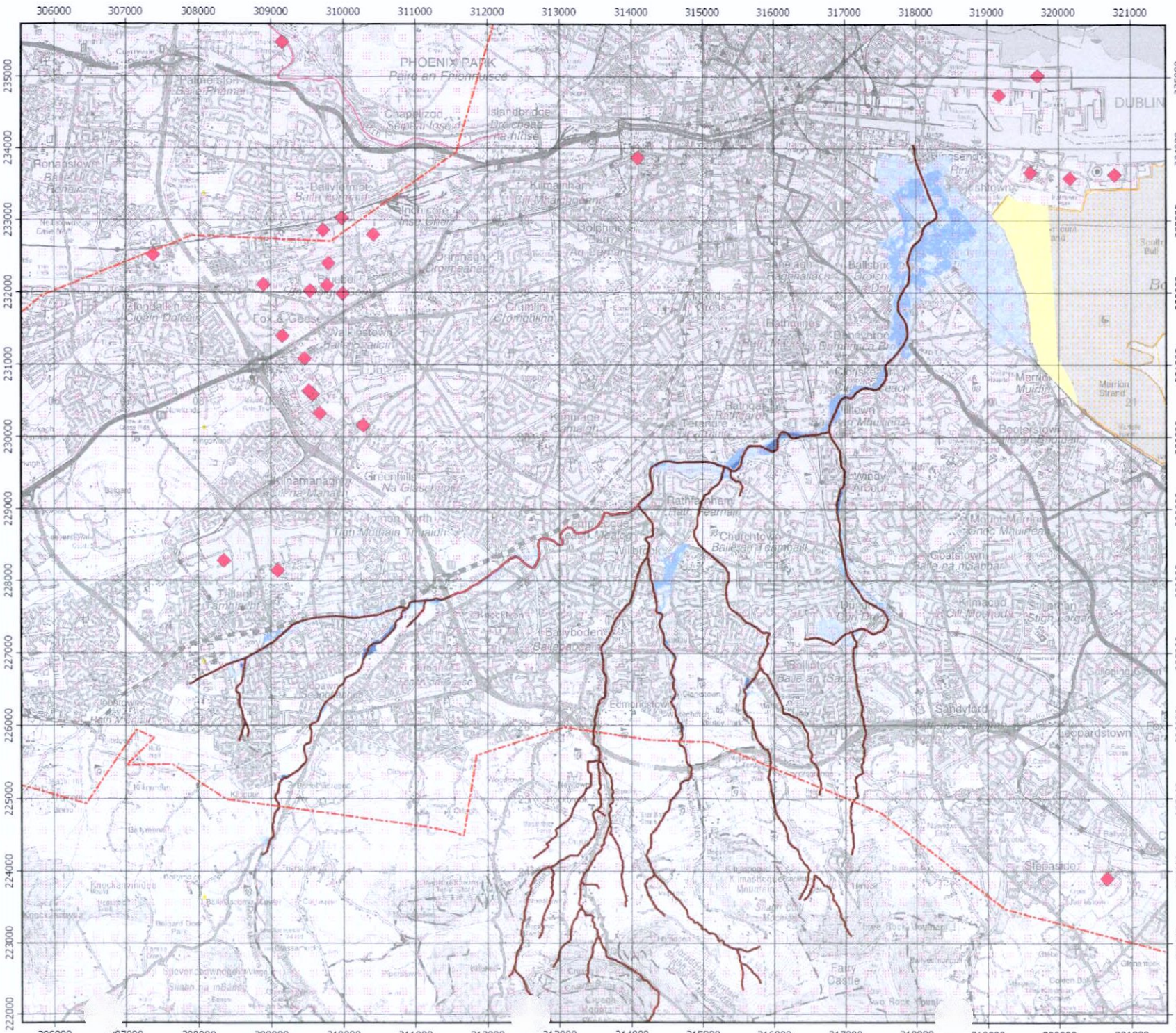
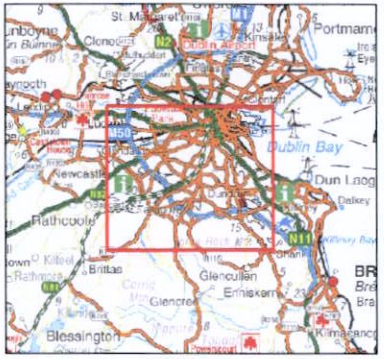


Location Plan:



LEGEND

- AFA Boundary
- IED Sites
- Designated for Drinking Water Abstraction
- Designated for Drinking Water Abstraction
- Recreational Waters
- SAC Water Dependent
- SAC Water Dependent
- SAC Water Dependent
- SPA Water Dependent
- Modelled River Centreline
- 10% AEP Fluvial
- 1% AEP Fluvial
- 0.1% AEP Fluvial

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

OPW

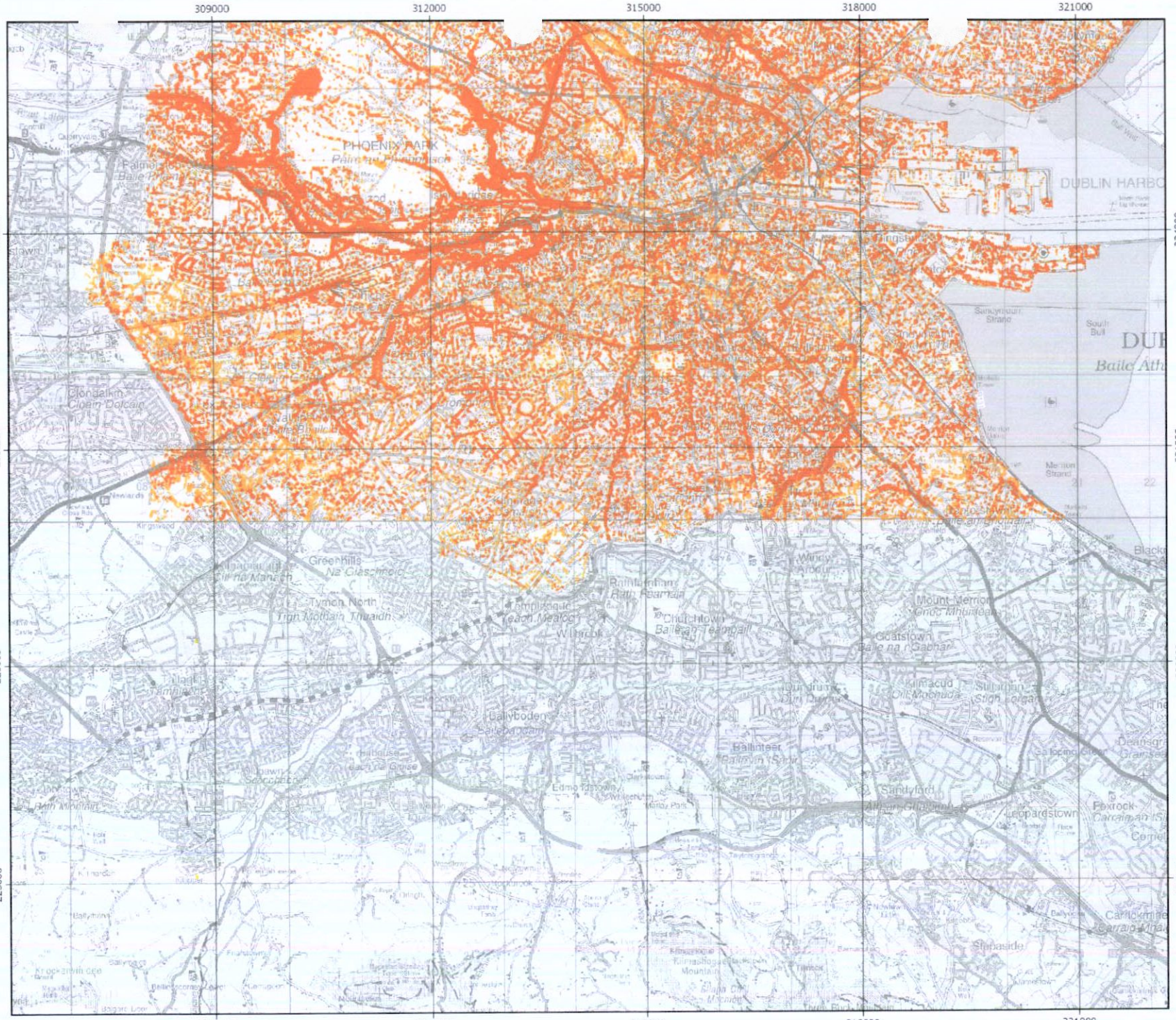
The Office of Public Works
Jonathan Swift Street
Trim
Co. Meath

Project:
DODDER STUDY

Map: **DUBLIN CITY**
FLUVIAL GENERAL RISK - ENVIRONMENT

Map Type:	GENERAL RISK ENVIRONMENT	
Source:	FLUVIAL	
Map Area	HPW	
Scenario:	CURRENT	
Drawn by:	IH	Date: Sep - 2016
Checked by:	MC	Date: Sep - 2016
Approved by:	JM	Date: Sep - 2016

Map No:
E09DCD_RVFCD_F0_01
Revision: F0
Map Scale: 1:50,000 Plot Scale: 1:1 @ A3



Location Plan:

LEGEND

- 10% AEP Pluvial
- 1% AEP Pluvial
- 0.5% AEP Pluvial

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

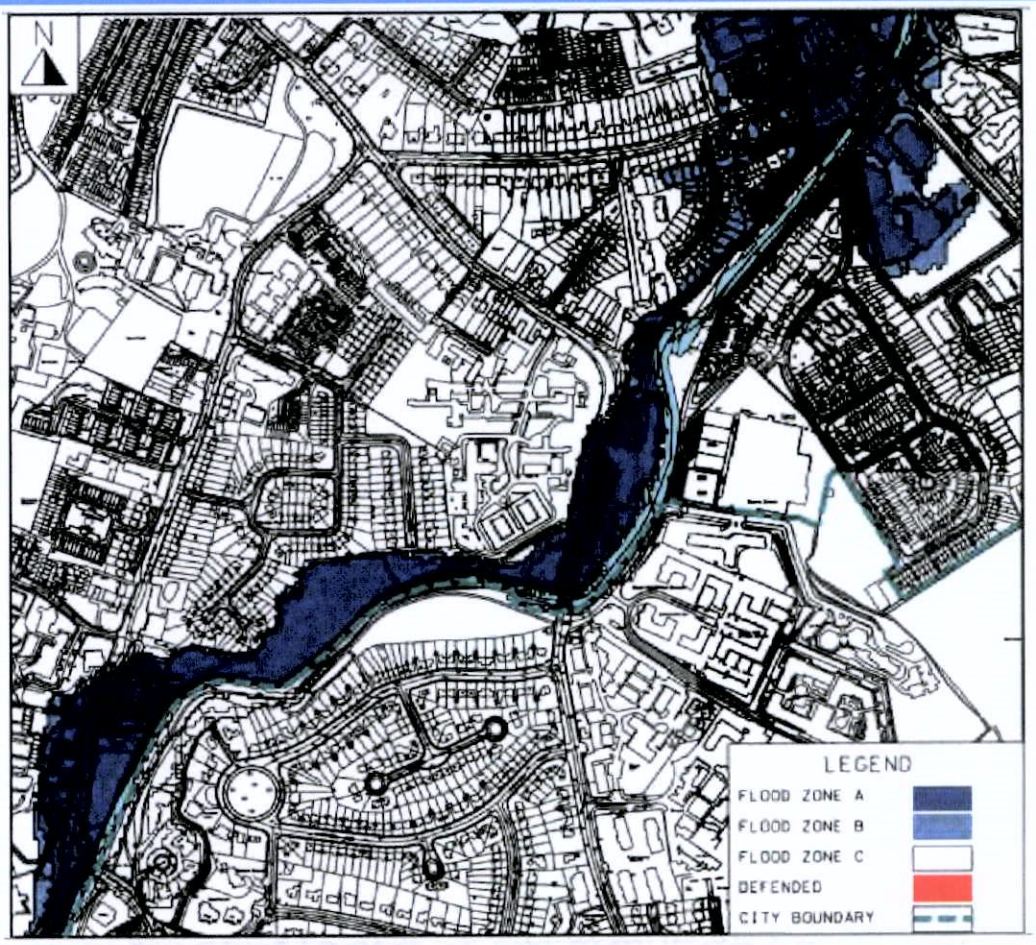
OPW
The Office Of Public Works
Jonathan Swift Street
Trim
Co. Meath

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council
Dublin City Council
Civic Offices
Wood Quay
Dublin 8

Project:
DUBLIN PLUVIAL STUDY (FloodResilienCity)

Map	DUBLIN CITY - PLUVIAL FLOOD EXTENT MAP
Map Type:	EXTENT - 180min Rainfall
Source:	PLUVIAL
Map Area:	URBAN
Scenario:	CURRENT
Drawn by:	IH Date: Aug - 2016
Checked by:	MC Date: Aug - 2016
Approved by:	JM Date: Aug - 2016
Map No.:	E09DCC_EXPCD_F0_03
Revision:	F0
Map Scale:	1:50,000 Plot Scale: 1:1 @ A3

Area: 11. Dodder: Donnybrook Bridge – Dundrum Road



For Land Use Zoning Maps Overlaid with Flood Zones see Dublin City Council Development Plan 2022 - 2028, Flood Map H.

Area Description	This area on the Dodder river goes from Donnybrook (Anglesea) Bridge to Clonskeagh Bridge to Dundrum Road Bridge. To the southeast it includes Beaver Row and Beech Hill Road (in Dun Laoghaire-Rathdown County Council). To the northwest it includes the rear of the lower part of Eglington Road, Dunbar, Brookvale Road, two Smurfit Weirs, Ashton's Pub and the Smurfit Site. Upstream of Clonskeagh Bridge it includes Clonskeagh House, Scully's Field, Strand Terrace in Milltown. The southern floodplains are in Dun Laoghaire-Rathdown County Council's area and it should be consulted on any proposed development in or adjacent to its area. The area has only fluvial and pluvial rainfall influences. Development in this area is a mixture of low to high density commercial and residential with infill development of both.

Area: 11. Dodder: Donnybrook Bridge – Dundrum Road	
SDRAs within this Area	N/A
Benefitting from Defences (flood relief scheme works)	Defences up to the first Smurfit Weir are under construction.
Sensitivity to Climate Change	An increase of 20% on top of the estimated 100-year fluvial level is planned to be catered for by storage upstream of where the Tallaght Stream joins the River Dodder. A 30% increase in fluvial flows should be used when assessing the viability of any critical development/ infrastructure.
Residual Risk	As no existing defences are utilised this is not currently applicable, but assessment of residual risks will be required when new flood defences are in place.
Historical Flooding	The SFRA flood maps are consistent with previous flooding of this section of the River Dodder in 1986 and 2011.
Surface Water	All surface water in this area needs to be carefully managed and provision made for significant rainfall events during high river flows. Should development be permitted, best practice with regard to surface water management should be implemented across the development area, to limit surface water run-off to current values. Separation of surface water and foul sewage flows should be carried out where possible. All developments shall have regard to the Pluvial Flood Maps in their Site Specific Flood Risk Assessment, see FloodResilienCity Project, Volume 2 City Wide Pluvial Flood Risk Assessment at http://www.dublincity.ie/main-menu-services-water-waste-and-environment-drains-sewers-and-waste-water/flood-prevention-plans.
Commentary on Flood Risk: The flood extents indicate flow paths generally coming directly out of the river channel. These can be compounded with local pluvial flooding if heavy rainfall coincides with high river flows. Backing up of the local combined and surface water network can occur when heavy rainfall coincides with high river flows. Some fluvial flood routes are modelled to leave upstream of the Lower Smurfit Weir and carry on down Beaver Row flooding Simmonscourt Terrace before draining slowly back into the river. Pluvial flooding in the past has exacerbated this flooding. Another flood route is from Strand Terrace through Scully's Field and down	

Area: 11. Dodder: Donnybrook Bridge – Dundrum Road

to Clonskeagh House, across the Clonskeagh Road into the Smurfit site and back into the river. Any development to alter these flood routes needs to be carefully planned.

These flood maps were produced based on the OPW CFRAM Dodder Pilot Study and checked against historic flooding in the area. A new flood study for this site started in 2020 and remains ongoing.

Development Options:

The main flood cells in this area are located in parkland and in small residential developments. No new development should be allowed in these green areas unless they are water compatible. All existing embankments and walls should be evaluated for new developments behind them.

Residential development (mainly infill) with a small amount of commercial would be a natural extension of existing development in this area. However, any development could reasonably be accommodated within the extents of Flood Zone C and should not need to extend into Flood Zone A or B unless defended. Some development may require to await future flood defence works in this area.

Justification Test for Development Plans

1. **Part 1 of the Justification Test is covered under Section 3.2.1 in the main body of the SFRA report.**

2. **The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:**

(i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement.

Answer: Yes: This area is an established residential suburb of Dublin City. This stretch of the Dodder goes from Donnybrook (Anglesea) Bridge to Clonskeagh Bridge to Dundrum Road Bridge. To the southeast, it includes Beaver Row and Beech Hill Road (in Dun Laoghaire Rathdown County Council's area). To the northwest, it includes the rear of lower part of Eglington Road, Dunbar, Brookvale Road, two Smurfit Weirs, Ashton's Pub and the Smurfit Site.

Upstream of Clonskeagh Bridge it includes the Clonskeagh House, Scully's field, Strand Terrace in Milltown. This area is essential to facilitate the expansion of the city.

(ii) Comprises significant previously developed and/or under-utilised lands.

Answer: Yes: The River along this stretch primarily flows through built-up established residential suburbs. Sites would generally consist of brownfield sites.

Area: 11. Dodder: Donnybrook Bridge – Dundrum Road

(iii) Is within or adjoining the core of an established or designated urban settlement.

Answer: Yes: The lands form part of the established / designated urban settlement of Dublin City.

(iv) Will be essential in achieving compact and sustainable urban growth.

Answer: Yes: (see response to (iii) above).

(v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

Answer: There are no suitable alternative lands for the particular uses or development type in areas at lower risk of flooding, within or adjoining the urban settlement.

3. Specific Flood Risk Assessment

- Some areas within Flood Zone A and B are open space, providing a river corridor along the Dodder. These lands should be retained as they will provide moderation of flows to currently developed areas.
- Larger scale development or regeneration should be configured to avoid development within Flood Zone A and B, thus reconnecting the floodplain and minimising downstream flows.
- Development within Flood Zone A and B should be limited to small residential/ commercial extensions or changes of use. Surface water and overland flows have been identified as being important in this area, so should be fully assessed in any site specific flood risk assessment.
- Liaison with Dun Laoghaire-Rathdown County Council is required for any proposed development which may have cause a change in flood risk in its area.

Conclusion: The subject area passes Part 1 and 2 of the Justification Test for Development Plans and although Part 3 has found that new development should be located in Flood Zone C and avoid Flood Zone A and B, in situations where the applicant can demonstrate compliance with the Development Management Justification Test in Box 5.1 of the Flood Risk Management Guidelines, applications will be considered on their merits, having regard to the mitigation and management measures which the development can put in place.

APPENDIX 11.3

IRISH WATER CORRESPONDENCE

UISCE ÉIREANN : IRISH WATER

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

CONFIRMATION OF FEASIBILITY

Sean Byrne

DBFL Consulting
Ormond House
Upper Ormond Quay
Dublin 7

D07 W704

18 October 2022

Our Ref: CDS22007307 Pre-Connection Enquiry
Sanford Road, Ranelagh, Dublin

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Irish Water has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 650 unit(s) at Sanford Road, Ranelagh, Dublin, (the **Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible without infrastructure upgrade by Irish Water

- The development can be supplied from the two proposed connections. Half the development (approx. 10 l/s) can be supplied from the Milltown Rd connection (Milltown Rd DMA) and the other half (approx. 10 l/s) from the Sandford Rd (Belmont DMA). Strategic SVs (in closed positions) would need to be located within the Development to established new boundaries. The valves can be opened temporarily during supply disruption to either DMAs.

- **Wastewater Connection** - Feasible without infrastructure upgrade by Irish Water

- Separate storm and foul water connection services have to be provided for the Development. Current storm water discharge, from the site, must be removed from the combined network. The storm water from the site must be discharged only into the existing storm water network that does

not discharge to an Irish Water combined / foul sewer. The connection arrangement should be agreed with the Local Authority Drainage Division.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Irish Water.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

Where can you find more information?

- **Section A** - What is important to know?
- **Section B** - Details of Irish Water's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Irish Water's network(s). This is not a connection offer and capacity in Irish Water's network(s) may only be secured by entering into a connection agreement with Irish Water.

For any further information, visit **www.water.ie/connections**, **email** newconnections@water.ie or contact 1800 278 278.

Yours sincerely,

Yvonne Harris

Yvonne Harris
Head of Customer Operations

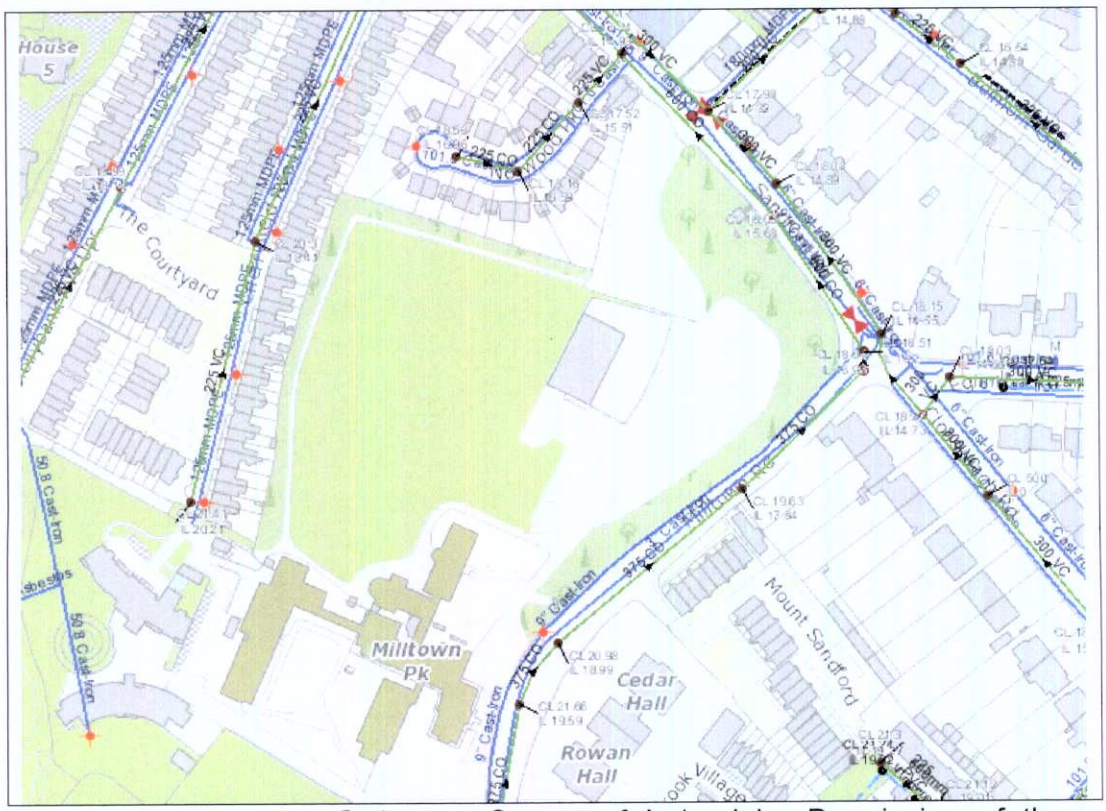
Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Irish Water's network(s). • Before the Development can connect to Irish Water's network(s), you must submit a connection application and be granted and sign a connection agreement with Irish Water.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Irish Water connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Irish Water's network(s), including works in the public space, must be carried out by Irish Water*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Irish Water's network(s)?	• Requests for maps showing Irish Water's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Irish Water Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Irish Water's Network(s)

The map included below outlines the current Irish Water infrastructure adjacent the Development: To access Irish Water Maps email datarequests@water.ie



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Note: The information provided on the included maps as to the position of Irish Water's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Irish Water.

Whilst every care has been taken in respect of the information on Irish Water's network(s), Irish Water assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Irish Water's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Irish Water's underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

Emma Daly
DBFL Consulting
Ormond House
Upper Ormond Quay
Dublin 7
Co. Dublin
D07W704

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448
South City
Delivery Office,
Cork City

www.water.ie

13 April 2023

Re: Design Submission for Sandford Road, Ranelagh, Dublin (the "Development") (the "Design Submission") / Connection Reference No: CDS19008588

Dear Emma Daly,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Irish Water has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before you can connect to our network you must sign a connection agreement with Irish Water. This can be applied for by completing the connection application form at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Irish Water's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Irish Water does not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Irish Water representative:
Name: Antonio Garzón
Email: antonio.garzon@water.ie

Yours sincerely,

Yvonne Harris

Yvonne Harris
Head of Customer Operations

Appendix A

Document Title & Revision

- 190226-DBFL-CS-SP-DR-C-1301 Site Services Layout
- 190226-DBFL-FW-SP-DR-C-3311 Foul Water Longsections Sheet 1
- 190226-DBFL-FW-SP-DR-C-3312 Foul Water Longsections Sheet 2
- 190226-DBFL-WM-SP-DR-C-1311 Site Watermain Layout

Additional Comments

The design submission will be subject to further technical review at connection application stage.

Irish Water cannot guarantee that its Network in any location will have the capacity to deliver a particular flow rate and associated residual pressure to meet the requirements of the relevant Fire Authority, see Section 1.17 of Water Code of Practice.

Note: meters for apartments or similar properties will be installed internally within the premises in accordance with the Building Controls Authority Requirements and subject to review by Irish Water.

For further information, visit ***www.water.ie/connections***

Notwithstanding any matters listed above, the Customer (including any appointed designers/contractors, etc.) is entirely responsible for the design and construction of the Self-Lay Works. Acceptance of the Design Submission by Irish Water will not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

APPENDIX 12.1

DUST MANAGEMENT PLAN

Dust Management Plan

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK (IAQM (2014), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997).

Site Management
The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 9.1 for the windrose for Dublin Airport). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (IAQM, 2014; UK ODPM, 2002). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods were care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of

dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Demolition

- Prior to demolition blocks should be soft striped inside buildings (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
- During the demolition process, water suppression should be used, preferably with a hand-held spray. Only the use of cutting, grinding or sawing equipment fitted or used in conjunction with a suitable dust suppression technique such as water sprays/local extraction should be used.
- Drop heights from conveyors, loading shovels, hoppers and other loading equipment should be minimised, if necessary fine water sprays should be employed.

Site Roads / Haulage Routes

Movement of construction trucks along site roads (particularly unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK ODPM, 2002).

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved site roads;
- Access gates to the site shall be located at least 10m from sensitive receptors where possible;
- Bowsers or suitable watering equipment will be available during periods of dry weather throughout the construction period. Research has found that watering can reduce dust emissions by 50% (USEPA, 1997). Watering shall be conducted during sustained dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use;
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.

Land Clearing / Earth Moving

Land clearing / earth-moving works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided.

Storage Piles

The location and moisture content of storage piles are important factors which determine their potential for dust emissions.

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors;

- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency (UK ODPM, 2002).
- Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger particles from impacting on nearby sensitive receptors.

Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads should be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- At the main site traffic exits, a wheel wash facility shall be installed if feasible. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

APPENDIX 14.1

RESOURCE & WASTE MANAGEMENT PLAN

awnconsulting
A Trinity Consultants Company

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

RESOURCE & WASTE MANAGEMENT PLAN FOR A PROPOSED RESIDENTIAL DEVELOPMENT

AT

MILLTOWN PARK, SANDFORD ROAD, DUBLIN 6

Report Prepared For

Sandford Living Limited

Report Prepared By

Chonaill Bradley
Principal Environmental Consultant

Our Reference

CB/227501.0715WMR01

Date of Issue

1 June 2023

AWN Consulting Limited
Registered in Ireland No. 319812

Document History

Document Reference		Original Issue Date	
CB/227501.00715WMR01		1 June 2023	
Revision Level	Revision Date	Description	Sections Affected

Record of Approval

Details	Written by	Approved by
Signature		
Name	Chonaill Bradley	Fergal Callaghan
Title	Principal Environmental Consultant	Director
Date	1 June 2023	1 June 2023

Contents

Page

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Resource and Waste Management Plan (RWMP) on behalf of behalf of Sandford Road Living. The development will principally consist of the reuse and refurbishment of Tabor House and The Chapel while demolishing the remaining structures on site and the provision of a predominantly residential development comprising residential duplexes and apartments with heights principally ranging from part 2 – part 10 storeys over part basement and ground level. The development will also include for a creche, community/cultural amenities, landscaping, services and internal roads.

This plan will provide information necessary to ensure that the management of Construction & Demolition (C&D) waste at the site is undertaken in accordance with the current legal and industry standards including the *Waste Management Acts 1996 - 2011* and associated Regulations [1], *Protection of the Environment Act 2003* as amended [2], *Litter Pollution Act 1997* as amended [3] and the *Eastern-Midlands Region Waste Management Plan 2015 – 2021* [4]. In particular, this Plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This RWMP includes information on the legal and policy framework for C&D waste management in Ireland, estimates of the type and quantity of waste to be generated by the proposed development and makes recommendations for management of different waste streams.

2.0 C&D RESOURCE & WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Irish Government issued a policy statement in September 1998 known as *'Changing Our Ways'* [5], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2013).

In response to the *Changing Our Ways* report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report entitled '*Recycling of Construction and Demolition Waste*' [6] concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

In September 2020, the Irish Government published a policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan, *'A Waste Action Plan for a Circular Economy'* [7] (WAPCE), replaces the previous national waste management plan, *"A Resource Opportunity"* (2012), and was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to an altered economical model, where climate and environmental challenges are turned into opportunities.

The WAPCE sets the direction for waste planning and management in Ireland up to 2025. This reorientates policy from a focus on managing waste to a much greater focus on creating circular patterns of production and consumption. Other policy statements

of a number of public bodies already acknowledge the circular economy as a national policy priority.

The policy document contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

One of the first actions to be taken was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021) [8] to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021. It is anticipated that the Strategy will be updated in full every 18 months to 2 years.

The Circular Economy and Miscellaneous Provisions Act 2022 [9] was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions, tackling the delays which can be encountered by industry, and supporting the availability of recycled secondary raw materials in the Irish market, and tackles illegal fly-tipping and littering.

The Environmental Protection Agency (EPA) of Ireland issued '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects' in November 2021* [10]. These guidelines replace the previous 2006 guidelines issued by The National Construction and Demolition Waste Council (NCDWC) and the Department of the Environment, Heritage and Local Government (DoEHLG) in 2006 [10]. The guidelines provide a practical approach which is informed by best practice in the prevention and management of C&D wastes and resources from design to construction of a project, including consideration of the deconstruction of a project. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Design teams roles and approach;
- Relevant EU, national and local waste policy, legislation and guidelines;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for Resource Manager (RM) and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies, Local Authority, etc.

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a RWMP for developments. The new guidance classifies developments on a two-tieredsystem. Developments which do not exceed any of the following thresholds may be classed as Tier 1 development:

- New residential development of less than 10 dwellings.
- Retrofit of 20 dwellings or less.

- New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m^2.
- Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m^2; and
- Demolition projects generating in total less than 100m^3 in volume of C&D waste.

A development which exceeds one or more of these thresholds is classed as Tier-2 projects.

This development requires a RWMP as a Tier 2 development as it is above following criterion:

- New residential development of less than 10 dwellings; and
- Demolition projects generating in total less than 100m^3 in volume of C&D waste.

Other guidelines followed in the preparation of this report include *'Construction and Demolition Waste Management – a handbook for Contractors and Site Managers'* [11], published by FÁS and the Construction Industry Federation in 2002 and the previous guildines, 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' (2006).

These guidance documents are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

2.2 Regional Level

The proposed development is located in the Local Authority area of Dublin City Council (DCC). The *Eastern-Midlands Region Waste Management Plan 2015 – 2021* is the regional waste management plan for the DCC area published in May 2015. The plan is set to be replaced in 2023 with a new national waste management plan.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of *"70% preparing for reuse, recycling and other recovery of construction and demolition waste"* (excluding natural soils and stones and hazardous wastes) to be achieved by 2020.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €130 - €150 per tonne of waste which includes a €75 per tonne landfill levy introduced under the *Waste Management (Landfill Levy) (Amendment) Regulations 2012.*

The *Dublin City Development Plan 2022 – 2028* [12] sets out a number of policies and objectives for Dublin City in line with the objectives of the National climate action policy and emphasises the need to take action to address climate action across all sectors of society and the economy. In the waste sector, policy on climate action is focused on a shift towards a 'circular economy' encompassing three core principles: designing out waste and pollution; keeping products and material in use; and regenerating natural systems. Further policies and objectives can be found within the development plan.
Policies:

- *CA7 F: minimising the generation of site and construction waste and maximising reuse or recycling.*

- *CA22: The Circular economy: To support the shift towards the circular economy approach as set out in 'a Waste Action Plan for a Circular Economy 2020 to 2025, Ireland's National Waste Policy, or as updated.*
- *CA23: To have regard to existing Best Practice Guidance on Waste Management Plans for Construction and Demolition Projects as well as any future updates to these guidelines in order to ensure the consistent application of planning requirements.*
- *SI27: Sustainable Waste Management: To support the principles of the circular economy, good waste management and the implementation of best practice in relation to waste management in order for Dublin City and the Region to become self-sufficient in terms of resource and waste management and to provide a waste management infrastructure that supports this objective.*
- *SI29: Segregated Storage and Collection of Waste Streams: To require new commercial and residential developments, to include adequate and easily accessible storage space that supports the separate collection of as many waste and recycling streams as possible, but at a minimum general domestic waste, dry recyclables and food waste as appropriate.*
- *SI30: To require that the storage and collection of mixed dry recyclables, organic and residual waste materials within proposed apartment schemes have regard to the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities 2020 (or and any future updated versions of these guidelines produced during the lifetime of this plan).*

Objectives:

- *SIO14 Local Recycling Infrastructure: To provide for a citywide network of municipal civic amenity facilities/ multi-material public recycling and reuse facilities in accessible locations throughout the city in line with the objectives of the circular economy and 15 minute city.*
- *SIO16 Eastern-Midlands Region Waste Management Plan: To support the implementation of the Eastern-Midlands Regional Waste Management Plan 2015–2021 and any subsequent plans in order to facilitate the transition from a waste management economy towards a circular economy.*

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 as amended.
- Environmental Protection Act 1992 as amended.
- Litter Pollution Act 1997 as amended.
- Planning and Development Act 2000 as amended [13]
- Circular Economy and Miscellaneous Provisions Act 2022.

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996 - 2001* and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal recycling, recovery or disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final destination. Following on from this is the concept of *"Polluter Pays"* whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise

from the incorrect management of waste produced, including the actions of any contractors engaged (e.g. for transportation and disposal/recovery/recycling of waste).

It is therefore imperative that the developer ensures that the waste contractors engaged by demolition and construction contractors are legally compliant with respect to waste transportation, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments* or a waste or IE licence granted by the EPA. The COR/permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

3.0 Design Approach

The client and the design team have integrated the *'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects'* guidelines into the design workshops, to help review processes, identify and evaluate resource reduction measures and investigate the impact on cost, time, quality, buildability, second life and management post demolition and construction. Further details on these design principles can be found within the aforementioned guidance document.

The design team have undertaken the design process in line with the international best practice principles to firstly prevent wastes, reuse where possible and thereafter sustainably reduce and recover materials. The below sections have been the focal point of the design process and material selections and will continue to be analysed and investigated throughout the design process and when selecting material.

The approaches presented are based on international principles of optimising resources and reducing waste on construction projects through:

- Prevention;
- Reuse;
- Recycling;
- Green Procurement Principles;
- Off-Site Construction;
- Materials Optimisation; and
- Flexibility and Deconstruction.

3.1 Designing For Prevention, Reuse and Recycling

Undertaken at the outset and during project feasibility and evaluation the Client and Design Team considered:

- Establishing the potential for any reusable site assets (buildings, structures, equipment, materials, soils, etc.);

- The potential for refurbishment and refit of existing structures or buildings rather than demolition and new build;
- Assessing any existing buildings on the site that can be refurbished either in part or wholly to meet the Client requirements; and
- Enabling the optimum recovery of assets on site.

3.2 Designing for Green Procurement

Waste prevention and minimisation pre-procurement have been discussed and will be further discussed in this section. The Design Team will discuss proposed design solutions, encourage innovation in tenders and incentivise competitions to recognise sustainable approaches. They should also discuss options for packaging reduction with the main Contractor and subcontractors/suppliers using measures such as 'Just-in-Time' delivery and use ordering procedures that avoid excessive waste. The Green procurement extends from the planning stage into the detailed design and tender stage and will be an ongoing part of the long-term design and selection process for this development.

3.3 Designing for Off-Site Construction

Use of off-site manufacturing has been shown to reduce residual wastes by up to 90% (volumetric building versus traditional). The decision to use offsite construction is typically cost led but there are significant benefits for resource management. Some further considerations for procurement will be investigated as part of the detailed design process are listed as follows:

- Modular buildings as these can displace the use of concrete and the resource losses associated with concrete blocks such as broken blocks, mortars, etc.;
  - Modular buildings are typically pre-fitted with fixed plasterboard and installed insulation, eliminating these residual streams from site.
- Use of pre-cast structural concrete panels which can reduce the residual volumes of concrete blocks, mortars, plasters, etc.;
- The use of prefabricated composite panels for walls and roofing to reduce residual volumes of insulation and plasterboards;
- Using pre-cast hollow-core flooring instead of in-situ ready mix flooring or timber flooring to reduce the residual volumes of concrete/formwork and wood/packaging, respectively; and
- Designing for the preferential use of offsite modular units.

3.4 Designing for Materials Optimisation During Construction

To ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite. This helps to reduce the environmental impacts associated with transportation of materials and from waste management activities. This includes investigating the use of standardised sizes for certain materials to help reduce the amount of offcuts produced on site, focusing on promotion and development of off-site manufacture.

3.5 Designing for Flexibility and Deconstruction

Design flexibility has and will be investigated throughout the design process to ensure that where possible products (including buildings) only contain materials that can be recycled and are designed to be easily disassembled. Material efficiency is being considered for the duration and end of life of a building project to produce; flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use; durability of materials and how they can be recovered effectively when maintenance and refurbishment are undertaken and during disassembly/deconstruction.

4.0 DESCRIPTION OF THE PROJECT

4.1 Location, Size and Scale of the Development

Sandford Living Limited intend to apply for permission for a large-scale residential development at this c. 4.26 hectare site at Milltown Park, Sandford Road, Dublin 6, D06 V9K7. Works are also proposed on Milltown Road and Sandford Road to facilitate access to the development including improvements to pedestrian facilities on an area of c. 0.16 hectares. The development's surface water drainage network shall discharge from the site via a proposed 300mm diameter pipe along Milltown Road through the junction of Milltown Road / Sandford Road prior to outfalling to the existing drainage network on Eglinton Road (approximately 200 metres from the Sandford Road / Eglinton Road junction), with these works incorporating an area of c. 0.32 hectares. The development site area, road works and drainage works areas will provide a total application site area of c. 4.74 hectares.

The development will principally consist of: the demolition of c. 4,883.9 sq m of existing structures on site including Milltown Park House (880 sq m); Milltown Park House Rear Extension (2,031 sq m); the Finlay Wing (622 sq m); the Archive (1,240 sq m); the link building between Tabor House and Milltown Park House rear extension to the front of the Chapel (74.5 sq m); and 36.4 sq m of the 'red brick link building' (single storey over basement) towards the south-western boundary; the refurbishment and reuse of Tabor House (1,575 sq m) and the Chapel (767.84 sq m), and the provision of a single storey glass entrance lobby to the front and side of the Chapel (51.9 sq m); and the provision of 636 No. apartment and duplex units (87 No. studios, 227 No. one bed units, 296 No. two bed units and 26 No. three bed units).

Block A1 will range in height from part 5 No. storeys to part 10 No. storeys and will comprise 96 No. apartments; Block A2 will range in height from part 6 No. storeys to part 8 No. storeys (including part double height at ground floor level) and will comprise 128 No. apartments; Block B will range in height from part 3 No. to part 7 No. storeys and will comprise 93 No. apartments; Block C will range in height from part 2 No. storeys to part 8 No. storeys (including part double height at ground floor level) and will comprise 163 No. apartments; Block D will range in height from 3 No. storeys to 5 No. storeys and will comprise 39 No. apartments; Block E will be 3 No. storeys in height and will comprise 24 No. duplex units and apartments; and Block F will range in height from 5 No. storeys to part 7 No. storeys and will comprise 93 No. apartments.

The development also includes the refurbishment of Tabor House (4 No. storeys including lower ground floor level) and the Chapel to provide cultural/community space; and the provision of a creche within Block F (380 sq m) with an outdoor play area.

The proposed works also include a new 2.4 metre high boundary wall across the site from east to west (towards the southern boundary) requiring the demolition of a portion of the red brick link building that lies within the subject site towards the south-western boundary (36.4 sq m) and the making good of the façade at the boundary. The existing Link Building is the subject of a separate planning application (granted permission under DCC Reg. Ref. No. 3866/20 and ABP Reg. Ref. ABP-311552-21) that included a request for permission to demolish that Link Building, including the part of the building on the lands the subject of this application for LRD permission. If that application is first implemented, no demolition works to the Link Building will be required under this application for LRD permission. If that application is not first implemented, permission is here sought to demolish only that part of the Link Building now existing on the lands the subject of this application for permission and to make good the balance at the red line with a blank wall.

The development also provides a new access from Milltown Road (which will be the principal vehicular entrance to the site) in addition to utilising and upgrading the existing access from Sandford Road as a secondary access principally for deliveries, emergencies and taxis; new pedestrian access points; pedestrian/bicycle connections through the site; 337 No. car parking spaces (288 No. at basement level and 49 No. at surface level); bicycle parking; 18 No. motorcycle spaces; bin storage; boundary treatments; private balconies and terraces facing all directions; external gantry access in sections of Blocks A1, A2 and C; hard and soft landscaping including public open space and communal open space; sedum roofs; PV panels; substations; lighting; plant; lift cores; and all other associated site works above and below ground.

The proposed development has a gross floor space of c. 54,507 sq m above ground level over a partial basement (under part of Block A1 and under Blocks A2, B and C) measuring c. 10,607 sq m, which includes parking spaces, bin storage, bike storage and plant.

Figure 4.1 Proposed Site Layout and Location(Source HJL)

4.2 Details of the Non-Hazardous Wastes to be produced

There will be waste materials generated from the demolition and refurbishment of the existing buildings onsite, to accommodate the proposed development. The Masterplan + Architectural Design Statement submitted with this application goes into further detail regarding which buildings are to be demolished and which are to be renovated and retained.

The volume of waste generated from demolition and renovations will be more difficult to segregate than waste generated from the construction phase, as many of the materials will be bonded together or integrated i.e. plasterboard on timber ceiling joists, steel embedded in concrete etc.

There will be soil, stones, clay and made ground excavated to facilitate construction of new foundations, underground services, and the installation of the proposed basement. The project engineers (DBFL Consulting Engineers) have estimated that between 74,000m^3 and 80,000m^3 of material will need to be excavated to do so. It is currently envisaged that 10,000m^3 will be able to be retained and reused onsite for landscaping, the remaining material, will need to be removed offsite due to the limited opportunities for reuse on site. This will be taken for appropriate offsite reuse, recovery, recycling and/or disposal.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be generated. The contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided on site during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

4.3 Potential Hazardous Wastes Arising

4.3.1 Contaminated Soil

Site investigations and environmental soil testing were undertaken between January and June 2020 by Ground Investigations Ireland (GII). A number of samples were analysed for a suite of parameters which allows for the assessment of the sampled material in terms of total pollutant content for classification of materials as hazardous or non-hazardous. The suite also allows for the assessment of the sampled material in terms of suitability for placement at licenced landfills (inert, stable non-reactive, hazardous etc.). The parameter list for the suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen.

The suite also includes those parameters specified in the EU Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC), which for the solid samples are total organic carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH.

If any potentially contaminated material is encountered, it will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' [12] using the HazWasteOnline application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC [13], which establishes the criteria for the acceptance of waste at landfills.

No asbestos was detected in the samples taken, however in the event that Asbestos containing materials (ACMs) are found, the removal will only be carried out by a suitably permitted waste contractor, in accordance with S.I. No. 386 of 2006 Safety,

Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. All asbestos will be taken to a suitably licensed or permitted facility.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the contractor will notify DCC and provide a Hazardous/Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the authorised waste collector(s).

4.3.2 Fuel/Oils

Fuels and oils are classed as hazardous materials; any on-site storage of fuel/oil, and all storage tanks and all draw-off points will be bunded and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and the site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel/oil waste generated at the site.

4.3.3 Invasive Plant Species

A site invasive species surveys were undertaken by Invasive Plant Solutions (IPS) in December 2020 and follow up surveys were undertaken in 2021, 2022 and 2023. The survey area included a site walkover survey of the entire site, and around part of the outside perimeter to search for any schedule 3 invasive species. Japanese Knotweed Fallopia japonica, which is listed on the Third Schedule of the Birds and Habitats Regulations, was not recorded on the site.

Japanese Knotweed (Fallopia japonica) is an alien invasive species listed under schedule 3 of Regulations SI No. 355/2015. IPS's report concludes that it is not present on this site and there was no indication that it is growing in the immediate vicinity.

The surveys detected the presence of spring emerging IAPS, namely Three Cornered Garlic and Spanish/Hybrid Spanish Bluebell, mainly concentrated within the woodland fringe running along the western end of the northern boundary, with an additional stand in the eastern sector of the site. These are being treated onsite.

No other invasive plant species that could hinder removal of soil from the site during groundworks, such as Japanese knotweed, giant rhubarb or Himalayan balsam were noted on site.

4.3.4 Asbestos

Multiple asbestos refurbishment/demolition surveys were undertaken by Asbestos Safe in June 2020 and again 2023 for areas that were unable to be reached during the initial survey. The surveys were confined to all accessible areas of the existing buildings which are due for demolition and/or refurbishment in the future.

Asbestos Containing Materials (ACM) were detected in several locations within some of the buildings including in floor tiling, rope seals, bitumen and stair nosing's.

Removal of asbestos or ACMs will be carried out by a suitably qualified contractor and ACM's will only be removed from site by a suitably permitted/licenced waste contractor. in accordance with S.I. No. 589 of 2010 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010. All material will be taken to a suitably licensed or permitted facility.

4.3.5 Other known Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner/cartridges, batteries (Lead, Ni-Cd or Mercury) and/or fluorescent tubes and other mercury containing waste may be generated from during C&D activities or temporary site offices. These wastes, if generated, will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

4.4 Main Construction and Demolition Waste Categories

The main non-hazardous and hazardous waste streams that could be generated by the construction activities at a typical site are shown in Table 6.1. The List of Waste (LoW) code (as effected from 1 June 2015) (also referred to as the European Waste Code or EWC) for each waste stream is also shown.

5.0 Roles and Responsibilities

The *Best Practice Guidelines on the Preparation of Resource Waste Management Plans for Construction and Demolition Projects* promotes that a RM should be appointed. The RM may be performed by number of different individuals over the life-cycle of the Project, however it is intended to be a reliable person chosen from within the Planning/Design/Contracting Team, who is technically competent and appropriately trained, who takes the responsibility to ensure that the objectives and measures within the Project RWMP are complied with. The RM is assigned the requisite authority to meet the objective and obligations of the RWMP. The role will include the important activities of conducting waste checks/audits and adopting construction and demolition methodology that is designed to facilitate maximum reuse and/or recycling of waste.

5.1 Role of the Client

The Client are the body establishing the aims and the performance targets for the project.

- The Client has commissioned the preparation and submission of a preliminary RWMP as part of the design and planning submission;
- The Client is to commission the preparation and submission of an updated RWMP as part of the construction tendering process;
- The Client will ensure that the RWMP is agreed on and submitted to the local authority prior to commencement of works on site;
- The Client is to request the end-of-project RWMP from the Contractor.

5.2 Role of the Client Advisory Team

The Client Advisory Team or Design Team is formed of architects, consultants, quantity surveyors and engineers and is responsible for:

- Drafting and maintaining the RWMP through the design, planning and procurement phases of the project;

- Appointing a RM to track and document the design process, inform the Design Team and prepare the RWMP.
- Including details and estimated quantities of all projected waste streams with the support of environmental consultants/scientists. This should also include data on waste types (e.g. waste characterisation data, contaminated land assessments, site investigation information) and prevention mechanisms (such as by-products) to illustrate the positive circular economy principles applied by the Design Team;
- Managing and valuing the demolition work with the support of quantity surveyors;
- Handing over of the RWMP to the selected Contractor upon commencement of construction of the development, in a similar fashion to how the safety file is handed over to the Contractor;
- Working with the Contractor as required to meet the performance targets for the project.

5.3 Future Role of the Contractor

The future demolition and construction Contractors have not yet been decided upon for this RWMP. However, once select they will have major roles to fulfil. They will be responsible for:

- Preparing, implementing and reviewing the (including the Pre-Demolition) RWMP throughout the demolition and construction phases (including the management of all suppliers and sub-contractors) as per the requirements of these guidelines;
- Identifying a designated and suitably qualified RM who will be responsible for implementing the RWMP;
- Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- Implementing waste management policies whereby waste materials generated on site are to be segregated as far as practicable;
- Renting and operating a mobile-crusher to crush concrete for temporary reuse onsite during construction and reduce the amount of HGV loads required to remove material from site;
- Applying for the appropriate waste permit to crush concrete onsite;
- Identifying all destinations for resources taken off-site. As above, any resource that is legally classified as a 'waste' must only be transported to an authorised waste facility;
- End-of-waste and by-product notifications addressed with the EPA where required;
- Clarification of any other statutory waste management obligations, which could include on-site processing;
- Full records of all resources (both wastes and other resources) should be maintained for the duration of the project; and
- Preparing a RWMP Implementation Review Report at project handover.

6.0 Key Materials & Quantities

6.1 Project Resource Targets

Project specific resource and waste management targets for the site have not yet been set and this information should be updated for these targets once these targets have been confirmed by the client. However, it is expected for projects of this nature that a