6. Railway yards including goods-handling yards, workshops, refuelling facilities or maintenance areas
7. Service stations including retail or commercial refuelling facilities
8. Transport depots or yards including areas used for refuelling or the bulk storage of hazardous substances

G Cemeteries and waste recycling, treatment and disposal

1. Cemeteries
2. Drum or tank reconditioning or recycling
3. Landfill sites
4. Scrap yards including automotive dismantling, wrecking or scrap metal yards
5. Waste disposal to land (excluding where biosolids have been used as soil conditioners)
6. Waste recycling or waste or wastewater treatment

H Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment

I Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment

Appendix C – RPD Calculations

RPD Calculations: 80 Hamlin Road, Ardmore

Parameter	SR02	SR02 (DUP)	RPD (%)	CSP SUR	CSP SUR (DUP)	RPD (%)	HB02	HB02 (DUP)	RPD (%)	HB20	HB20 (DUP)	RPD (%)
Total Recoverable Arsenic	15	15	0.00	22	39	*55.74*	-	-	-	-	-	-
Total Recoverable Cadmium	-	-	-	-	-	-	-	-	-	-	-	-
Total Recoverable Chromium	-	-	-	18	33	*58.82*	-	-	-	-	-	-
Total Recoverable Copper	17	19	11.11	39	57	37.50	-	-	-	-	-	-
Total Recoverable Lead	13	13.3	2.28	-	-	-	59	58	1.71	17	16.1	5.44
Total Recoverable Nickel	-	-	-	-	-	-	-	-	-	-	-	-
Total Recoverable Zinc	-	-	-	-	-	-	-	-	-	-	-	-

Note: Results in *I talics* exceed 30% RPD. Results in red exceed 50% RPD

Appendix D – Tabulated Lead Results

Sample	Pb
Pb01	55
Pb02	34
Pb03	***280***
Pb04	***640***
Pb05	***1060***
Pb06	14.4
Pb07	*142*
Pb08	***500***
Pb09	***4300***
Pb10	***800***
Pb11	*91*
Pb12	52
Pb13	48
Pb14	59
Pb15	*143*
Pb16	*93*
Pb17	*158*
HB01	*83*
HB02	59
HB03	27
HB04	39
HB05	*186*
HB06	*104*
HB08	***300***
HB09	50
HB10	*70*
HB11	***340***
HB12	52
HB13	65
HB14	20
HB15	63
HB16	45
HB17	28
HB18	49
HB19	53
HB20	17
HB21	37
HB22	26

Note: All results in mg/kg. Results in Red exceed the SCS(health) for residential land use. Results in blue also exceed the Soil Contaminant Standards for health (SCSs(health)) for commercial/industrial worker Results in **Bold** exceed the discharge criteria of the AUP: OP. Results in *Italics* exceed the maximum Auckland background concentrations for non-volcanic soils outlined in the Auckland Regional Council Technical Publication No.153, Oct 2001.

Appendix E – Laboratory Transcripts

Hill Laboratories
TRIED, TESTED AND TRUSTED

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Certificate of Analysis

Client:	Focus Environmental Services Limited	**Lab No:**	2569586	SPv4
Contact:	Joseph McLay	**Date Received:**	27-Mar-2021	
	C/- Focus Environmental Services Limited	**Date Reported:**	09-Apr-2021	
	PO Box 11455	**Quote No:**	80876	
	Ellerslie	**Order No:**		
	Auckland 1542	**Client Reference:**	1443.009	
		Submitted By:	Joseph McLay	

Sample Type: Soil

Sample Name:		SR01 25-Mar-2021	SR02 25-Mar-2021	Pb01 25-Mar-2021	Pb02 25-Mar-2021	Pb03 25-Mar-2021
Lab Number:		2569586.1	2569586.2	2569586.3	2569586.4	2569586.5
Individual Tests						
Dry Matter	g/100g as rcvd	76	77	-	-	-
Total Recoverable Arsenic	mg/kg dry wt	130	15	-	-	-
Total Recoverable Copper	mg/kg dry wt	144	17	-	-	-
Total Recoverable Lead	mg/kg dry wt	40	13.0	55	34	280
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.013	< 0.013	-	-	-
alpha-BHC	mg/kg dry wt	< 0.013	< 0.013	-	-	-
beta-BHC	mg/kg dry wt	< 0.013	< 0.013	-	-	-
delta-BHC	mg/kg dry wt	< 0.013	< 0.013	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013	< 0.013	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.013	< 0.013	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.013	< 0.013	-	-	-
2,4'-DDD	mg/kg dry wt	< 0.013	< 0.013	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.013	< 0.013	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.013	< 0.013	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.013	< 0.013	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.013	< 0.013	-	-	-
4,4'-DDT	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Total DDT Isomers	mg/kg dry wt	< 0.08	< 0.08	-	-	-
Dieldrin	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Endosulfan I	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Endosulfan II	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Endrin	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Endrin ketone	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Heptachlor	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.013	< 0.013	-	-	-
Methoxychlor	mg/kg dry wt	< 0.013	< 0.013	-	-	-

Sample Name:	Pb04 25-Mar-2021	Pb05 25-Mar-2021	Pb06 25-Mar-2021	Pb07 25-Mar-2021	Pb08 25-Mar-2021
Lab Number:	2569586.6	2569586.7	2569586.8	2569586.9	2569586.10

Sample Type: Soil						
Sample Name:		Pb04 25-Mar-2021	Pb05 25-Mar-2021	Pb06 25-Mar-2021	Pb07 25-Mar-2021	Pb08 25-Mar-2021
Lab Number:		2569586.6	2569586.7	2569586.8	2569586.9	2569586.10
Individual Tests						
Total Recoverable Lead	mg/kg dry wt	640	1,060	14.4	142	500

Sample Name:		Pb09 25-Mar-2021	Pb10 25-Mar-2021	Pb11 25-Mar-2021	Pb12 25-Mar-2021	Pb13 25-Mar-2021
Lab Number:		2569586.11	2569586.12	2569586.13	2569586.14	2569586.15
Individual Tests						
Total Recoverable Lead	mg/kg dry wt	4,300	800	91	52	48

Sample Name:		Pb14 25-Mar-2021	Pb15 25-Mar-2021	Pb16 25-Mar-2021	Pb17 25-Mar-2021	HB01 25-Mar-2021
Lab Number:		2569586.16	2569586.17	2569586.18	2569586.19	2569586.20
Individual Tests						
Total Recoverable Lead	mg/kg dry wt	59	143	93	158	83

Sample Name:		HB02 25-Mar-2021	HB03 25-Mar-2021	HB04 25-Mar-2021	HB05 25-Mar-2021	HB06 25-Mar-2021
Lab Number:		2569586.21	2569586.22	2569586.23	2569586.24	2569586.25
Individual Tests						
Total Recoverable Lead	mg/kg dry wt	59	27	39	186	104

Sample Name:		HB08 25-Mar-2021	HB11 25-Mar-2021	HB13 25-Mar-2021	HB14 25-Mar-2021	HB15 25-Mar-2021
Lab Number:		2569586.26	2569586.27	2569586.28	2569586.29	2569586.30
Individual Tests						
Total Recoverable Lead	mg/kg dry wt	300	340	65	20	63

Sample Name:		HB16 25-Mar-2021	HB17 25-Mar-2021	HB18 25-Mar-2021	HB19 25-Mar-2021	HB20 25-Mar-2021
Lab Number:		2569586.31	2569586.32	2569586.33	2569586.34	2569586.35
Individual Tests						
Total Recoverable Lead	mg/kg dry wt	45	28	49	53	17.0

Sample Name:		HB21 25-Mar-2021	HB22 25-Mar-2021	TT01 25-Mar-2021	CSP SUR 25-Mar-2021	CSP 0.4m 25-Mar-2021
Lab Number:		2569586.36	2569586.37	2569586.46	2569586.47	2569586.48
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	91	73	83
Total Recoverable Lead	mg/kg dry wt	37	26	-	-	-
CCA by ICP-MS						
Total Recoverable Arsenic	mg/kg dry wt	-	-	8	22	34
Total Recoverable Chromium	mg/kg dry wt	-	-	21	18	53
Total Recoverable Copper	mg/kg dry wt	-	-	30	39	50
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
alpha-BHC	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
beta-BHC	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
delta-BHC	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
cis-Chlordane	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
trans-Chlordane	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
2,4'-DDD	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
4,4'-DDD	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
2,4'-DDE	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
4,4'-DDE	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
2,4'-DDT	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
4,4'-DDT	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
Total DDT Isomers	mg/kg dry wt	-	-	< 0.07	< 0.09	< 0.08
Dieldrin	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
Endosulfan I	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
Endosulfan II	mg/kg dry wt	-	-	< 0.011	< 0.06 #1	< 0.06 #1
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012

Sample Type: Soil						
Sample Name:		HB21 25-Mar-2021	HB22 25-Mar-2021	TT01 25-Mar-2021	CSP SUR 25-Mar-2021	CSP 0.4m 25-Mar-2021
Lab Number:		2569586.36	2569586.37	2569586.46	2569586.47	2569586.48
Organochlorine Pesticides Screening in Soil						
Endrin	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
Endrin aldehyde	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
Endrin ketone	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
Heptachlor	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
Methoxychlor	mg/kg dry wt	-	-	< 0.011	< 0.014	< 0.012
Haloethers in SVOC Soil Samples by GC-MS						
Bis(2-chloroethoxy) methane	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Bis(2-chloroethyl)ether	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Bis(2-chloroisopropyl)ether	mg/kg dry wt	-	-	-	< 0.5	< 0.5
4-Bromophenyl phenyl ether	mg/kg dry wt	-	-	-	< 0.4	< 0.4
4-Chlorophenyl phenyl ether	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Nitrogen containing compounds in SVOC Soil Samples by GC-MS						
2,4-Dinitrotoluene	mg/kg dry wt	-	-	-	< 1.0	< 1.0
2,6-Dinitrotoluene	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Nitrobenzene	mg/kg dry wt	-	-	-	< 0.5	< 0.5
N-Nitrosodi-n-propylamine	mg/kg dry wt	-	-	-	< 0.8	< 0.8
N-Nitrosodiphenylamine + Diphenylamine	mg/kg dry wt	-	-	-	< 0.8	< 0.8
Organochlorine Pesticides in SVOC Soil Samples by GC-MS						
Aldrin	mg/kg dry wt	-	-	-	< 0.5	< 0.5
alpha-BHC	mg/kg dry wt	-	-	-	< 0.5	< 0.5
beta-BHC	mg/kg dry wt	-	-	-	< 0.5	< 0.5
delta-BHC	mg/kg dry wt	-	-	-	< 0.5	< 0.5
gamma-BHC (Lindane)	mg/kg dry wt	-	-	-	< 0.5	< 0.5
4,4'-DDD	mg/kg dry wt	-	-	-	< 0.5	< 0.5
4,4'-DDE	mg/kg dry wt	-	-	-	< 0.5	< 0.5
4,4'-DDT	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Dieldrin	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Endosulfan I	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Endosulfan II	mg/kg dry wt	-	-	-	< 2	< 2
Endosulfan sulphate	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Endrin	mg/kg dry wt	-	-	-	< 0.8	< 0.8
Endrin ketone	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Heptachlor	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Heptachlor epoxide	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Hexachlorobenzene	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Polycyclic Aromatic Hydrocarbons in SVOC Soil Samples by GC-MS*						
Acenaphthene	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Acenaphthylene	mg/kg dry wt	-	-	-	0.8	1.7
Anthracene	mg/kg dry wt	-	-	-	3.1	2.7
Benzo[a]anthracene	mg/kg dry wt	-	-	-	0.6	1.3
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	-	0.6	1.0
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	-	0.5	1.3
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	-	0.6	0.7
Benzo[k]fluoranthene	mg/kg dry wt	-	-	-	< 0.5	< 0.5
1&2-Chloronaphthalene	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Chrysene	mg/kg dry wt	-	-	-	0.6	1.3
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Fluoranthene	mg/kg dry wt	-	-	-	1.8	7.0
Fluorene	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	-	0.5	0.6
2-Methylnaphthalene	mg/kg dry wt	-	-	-	< 0.5	< 0.5

Sample Type: Soil							
Sample Name:		HB21 25-Mar-2021	HB22 25-Mar-2021	TT01 25-Mar-2021	CSP SUR 25-Mar-2021	CSP 0.4m 25-Mar-2021
Lab Number:		2569586.36	2569586.37	2569586.46	2569586.47	2569586.48
Polycyclic Aromatic Hydrocarbons in SVOC Soil Samples by GC-MS*						
Naphthalene	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Phenanthrene	mg/kg dry wt	-	-	-	0.5	1.1
Pyrene	mg/kg dry wt	-	-	-	4.0	6.2
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	-	-	< 1.3	1.4
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	-	-	< 1.3	1.4
Phenols in SVOC Soil Samples by GC-MS						
4-Chloro-3-methylphenol	mg/kg dry wt	-	-	-	< 5	< 5
2-Chlorophenol	mg/kg dry wt	-	-	-	< 1.0	< 1.0
2,4-Dichlorophenol	mg/kg dry wt	-	-	-	< 1.0	< 1.0
2,4-Dimethylphenol	mg/kg dry wt	-	-	-	< 3	< 3
3 & 4-Methylphenol (m- + p-cresol)	mg/kg dry wt	-	-	-	< 3	< 3
2-Methylphenol (o-Cresol)	mg/kg dry wt	-	-	-	< 1.0	< 1.0
2-Nitrophenol	mg/kg dry wt	-	-	-	< 5	< 5
Pentachlorophenol (PCP)	mg/kg dry wt	-	-	-	76	< 30
Phenol	mg/kg dry wt	-	-	-	< 1.0	< 1.0
2,4,5-Trichlorophenol	mg/kg dry wt	-	-	-	< 1.0	< 1.0
2,4,6-Trichlorophenol	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Plasticisers in SVOC Soil Samples by GC-MS						
Bis(2-ethylhexyl)phthalate	mg/kg dry wt	-	-	-	< 5	< 5
Butylbenzylphthalate	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Di(2-ethylhexyl)adipate	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Diethylphthalate	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Dimethylphthalate	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Di-n-butylphthalate	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Di-n-octylphthalate	mg/kg dry wt	-	-	-	< 1.0	< 1.0
Other Halogenated compounds in SVOC Soil Samples by GC-MS						
1,2-Dichlorobenzene	mg/kg dry wt	-	-	-	< 0.8	< 0.8
1,3-Dichlorobenzene	mg/kg dry wt	-	-	-	< 0.8	< 0.8
1,4-Dichlorobenzene	mg/kg dry wt	-	-	-	< 0.8	< 0.8
Hexachlorobutadiene	mg/kg dry wt	-	-	-	< 0.8	< 0.8
Hexachloroethane	mg/kg dry wt	-	-	-	< 0.8	< 0.8
1,2,4-Trichlorobenzene	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Other compounds in SVOC Soil Samples by GC-MS						
Benzyl alcohol	mg/kg dry wt	-	-	-	< 10	< 10
Carbazole	mg/kg dry wt	-	-	-	< 0.5	0.7
Dibenzofuran	mg/kg dry wt	-	-	-	< 0.5	< 0.5
Isophorone	mg/kg dry wt	-	-	-	< 0.5	< 0.5

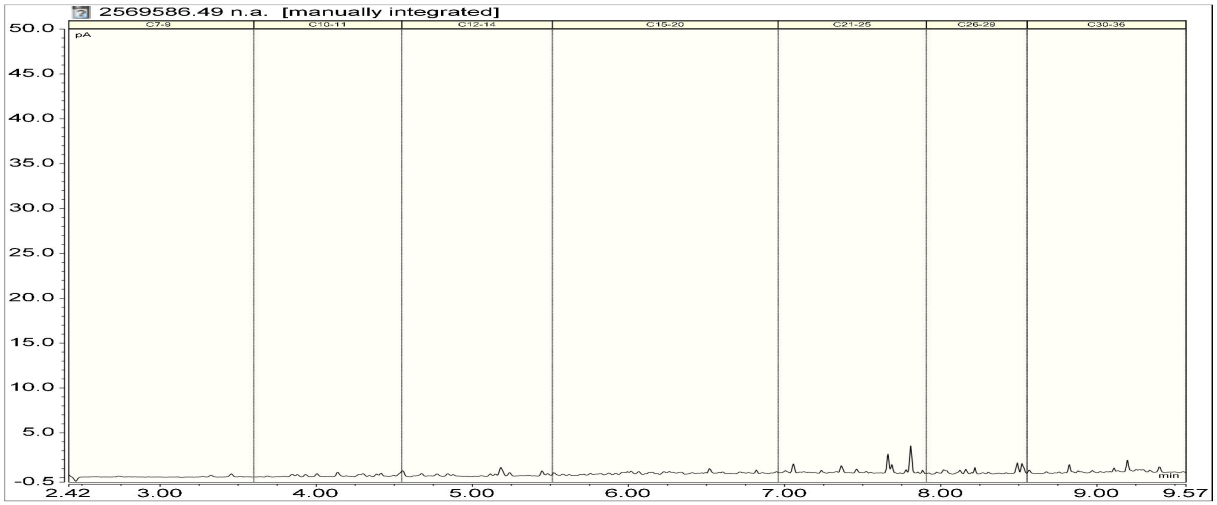
Sample Name:		FS01 25-Mar-2021	FS02 25-Mar-2021	FS03 25-Mar-2021	SR02 [Duplicate] 25-Mar-2021	CSP SUR [Duplicate] 25-Mar-2021
Lab Number:		2569586.49	2569586.50	2569586.51	2569586.52	2569586.53
Individual Tests						
Dry Matter	g/100g as rcvd	98	89	96	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	-	-	15	39
Total Recoverable Chromium	mg/kg dry wt	-	-	-	-	33 [#3]
Total Recoverable Copper	mg/kg dry wt	-	-	-	19	57
Total Recoverable Lead	mg/kg dry wt	-	-	-	13.3	-
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	2.1	2.6	2.4	-	-
1-Methylnaphthalene	mg/kg dry wt	0.68	< 0.011	0.050	-	-
2-Methylnaphthalene	mg/kg dry wt	0.42	< 0.011	0.040	-	-

Sample Type: Soil						
Sample Name:		FS01 25-Mar-2021	FS02 25-Mar-2021	FS03 25-Mar-2021	SR02 [Duplicate] 25-Mar-2021	CSP SUR [Duplicate] 25-Mar-2021
Lab Number:		2569586.49	2569586.50	2569586.51	2569586.52	2569586.53
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Acenaphthylene	mg/kg dry wt	< 0.010	< 0.011	< 0.010	-	-
Acenaphthene	mg/kg dry wt	< 0.010	< 0.011	< 0.010	-	-
Anthracene	mg/kg dry wt	0.072	< 0.011	0.053	-	-
Benzo[a]anthracene	mg/kg dry wt	< 0.10 #2	< 0.011	0.091	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.016	< 0.011	0.164	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	< 0.04	< 0.03	0.26	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	< 0.04	< 0.03	0.26	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	0.011	< 0.011	0.20	-	-
Benzo[e]pyrene	mg/kg dry wt	0.012	0.012	0.51	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	0.011	< 0.011	0.54	-	-
Benzo[k]fluoranthene	mg/kg dry wt	< 0.010	< 0.011	0.033	-	-
Chrysene	mg/kg dry wt	0.015	< 0.011	< 0.10 #2	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	< 0.010	< 0.011	0.036	-	-
Fluoranthene	mg/kg dry wt	0.046	< 0.011	0.045	-	-
Fluorene	mg/kg dry wt	0.103	< 0.011	< 0.010	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.011	< 0.011	0.26	-	-
Naphthalene	mg/kg dry wt	0.54	< 0.06	0.07	-	-
Perylene	mg/kg dry wt	< 0.010	< 0.011	0.020	-	-
Phenanthrene	mg/kg dry wt	0.114	< 0.011	0.012	-	-
Pyrene	mg/kg dry wt	0.046	2.6	0.21	-	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 8	< 8	< 8	-	-
C10 - C14	mg/kg dry wt	28	300	24	-	-
C15 - C36	mg/kg dry wt	173	8,700	630	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	200	9,000	650	-	-

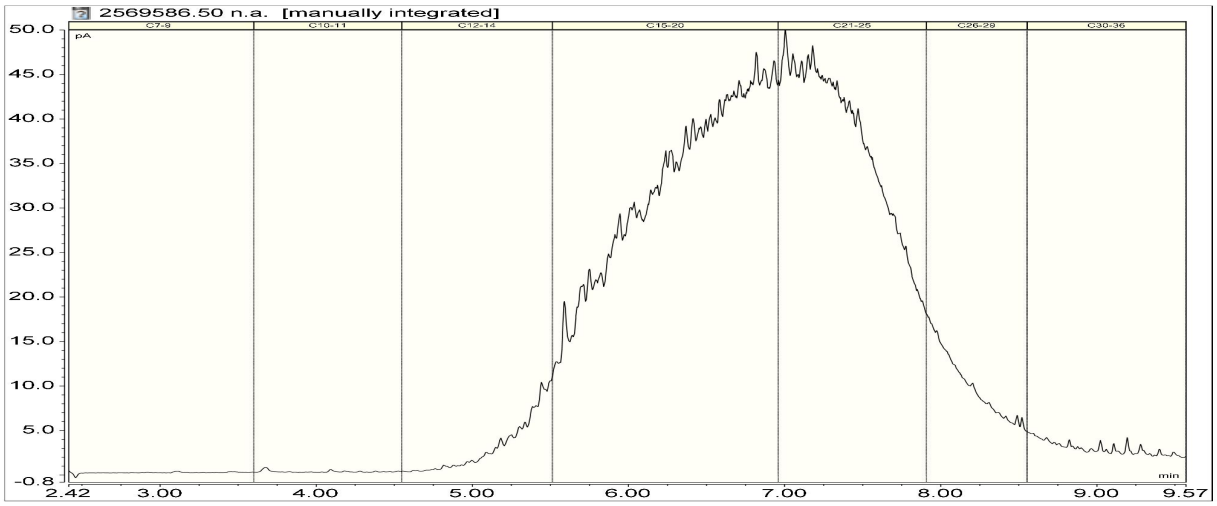
Sample Name:		HB02 [Duplicate] 25-Mar-2021	HB20 [Duplicate] 25-Mar-2021	Composite of Comp01 A, Comp01 B, Comp01 C and Comp01 D	Composite of Comp02 A, Comp02 B, Comp02 C and Comp02 D	
Lab Number:		2569586.54	2569586.55	2569586.56	2569586.57	
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	78	77	-
Total Recoverable Arsenic	mg/kg dry wt	-	-	6	6	-
Total Recoverable Copper	mg/kg dry wt	-	-	28	33	-
Total Recoverable Lead	mg/kg dry wt	58	16.1	39	34	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	< 0.013	< 0.013	-
alpha-BHC	mg/kg dry wt	-	-	< 0.013	< 0.013	-
beta-BHC	mg/kg dry wt	-	-	< 0.013	< 0.013	-
delta-BHC	mg/kg dry wt	-	-	< 0.013	< 0.013	-
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.013	< 0.013	-
cis-Chlordane	mg/kg dry wt	-	-	< 0.013	< 0.013	-
trans-Chlordane	mg/kg dry wt	-	-	< 0.013	< 0.013	-
2,4'-DDD	mg/kg dry wt	-	-	< 0.013	< 0.013	-
4,4'-DDD	mg/kg dry wt	-	-	< 0.013	< 0.013	-
2,4'-DDE	mg/kg dry wt	-	-	< 0.013	< 0.013	-
4,4'-DDE	mg/kg dry wt	-	-	< 0.013	< 0.013	-
2,4'-DDT	mg/kg dry wt	-	-	< 0.013	< 0.013	-
4,4'-DDT	mg/kg dry wt	-	-	< 0.013	< 0.013	-
Total DDT Isomers	mg/kg dry wt	-	-	< 0.08	< 0.08	-
Dieldrin	mg/kg dry wt	-	-	< 0.013	< 0.013	-
Endosulfan I	mg/kg dry wt	-	-	< 0.013	< 0.013	-

Sample Type: Soil						
Sample Name:		HB02 [Duplicate] 25-Mar-2021	HB20 [Duplicate] 25-Mar-2021	Composite of Comp01 A, Comp01 B, Comp01 C and Comp01 D	Composite of Comp02 A, Comp02 B, Comp02 C and Comp02 D	
Lab Number:		2569586.54	2569586.55	2569586.56	2569586.57	
Organochlorine Pesticides Screening in Soil						
Endosulfan II	mg/kg dry wt	-	-	< 0.013	< 0.013	-
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.013	< 0.013	-
Endrin	mg/kg dry wt	-	-	< 0.013	< 0.013	-
Endrin aldehyde	mg/kg dry wt	-	-	< 0.013	< 0.013	-
Endrin ketone	mg/kg dry wt	-	-	< 0.013	< 0.013	-
Heptachlor	mg/kg dry wt	-	-	< 0.013	< 0.013	-
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.013	< 0.013	-
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.013	< 0.013	-
Methoxychlor	mg/kg dry wt	-	-	< 0.013	< 0.013	-

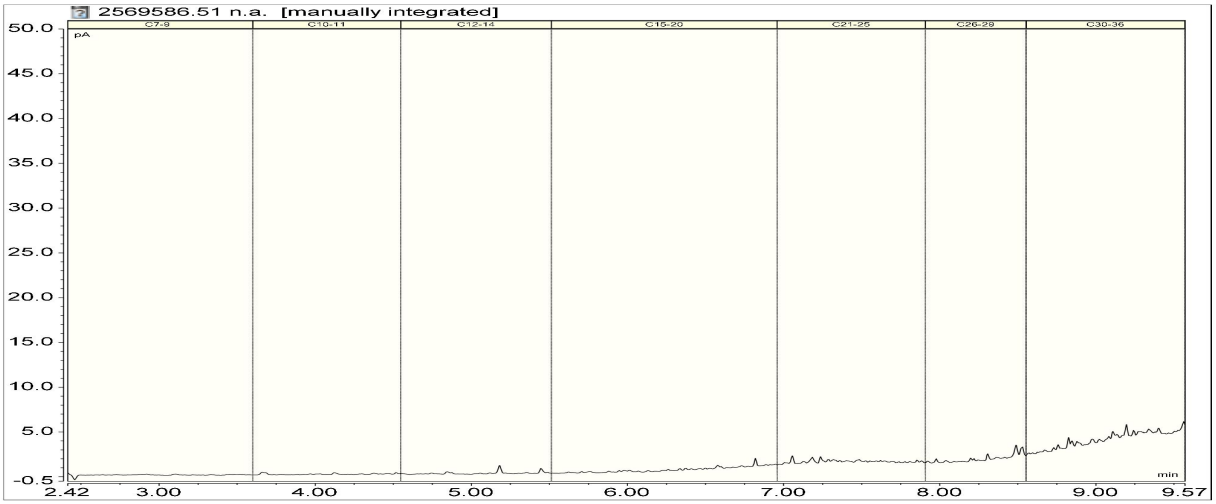
2569586.49
FS01 25-Mar-2021
Client Chromatogram for TPH by FID



2569586.50
FS02 25-Mar-2021
Client Chromatogram for TPH by FID



2569586.51
FS03 25-Mar-2021
Client Chromatogram for TPH by FID



Analyst's Comments

#1 Due to some interference found in the chromatography, the detection limit was raised. Hence the higher detection limit reported.

#2 Due to some interference found in the chromatography, the detection limit was raised. Hence the higher detection limit reported.

#3 It should be noted that the replicate analyses performed on this sample as part of our in-house Quality Assurance procedures showed greater variation than would normally be expected. This may reflect the heterogeneity of the sample. Replicate 1 = 33mg/kg, replicate 2 = 26mg/kg.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-37, 46-48, 52-57
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation May contain a residual moisture content of 2-5%.	-	1-37, 46-48, 54-57
Total of Reported PAHs in Soil	Sonication extraction, GC-MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	49-51
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-2, 46-51, 56-57
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-37, 46-48, 54-57
Total Recoverable Arsenic	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	1-2, 56-57
Total Recoverable Copper	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	1-2, 56-57
Total Recoverable Lead	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.4 mg/kg dry wt	1-37, 54-57

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.002 mg/kg dry wt	49-51
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.002 mg/kg dry wt	49-51
TPH Oil Industry Profile + PAHscreen	Sonication extraction, GC-FID and GC-MS analysis. Tested on as received sample. In-house based on US EPA 8015 and US EPA 8270.	0.002 - 70 mg/kg dry wt	49-51
CCA by ICP-MS	Total recoverable digestion, ICP-MS, screen level.	2 mg/kg dry wt	46-48
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.4 - 2 mg/kg dry wt	52
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	2 mg/kg dry wt	53
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	1-2, 46-48, 56-57
Semivolatile Organic Compounds Screening in Soil by GC-MS	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 30 mg/kg dry wt	47-48
Total Petroleum Hydrocarbons in Soil			
Client Chromatogram for TPH by FID	Small peaks associated with QC compounds may be visible in chromatograms with low TPH concentrations. QC peaks are as follows: one peak in the C12 - 14 band, the C21 - 25 band and the C30 - 36 band. All QC peaks are corrected for in the reported TPH concentrations.	-	49-51
C7 - C9	Solvent extraction, GC-FID analysis. In-house based on US EPA 8015.	8 mg/kg dry wt	49-51
C10 - C14	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	20 mg/kg dry wt	49-51
C15 - C36	Solvent extraction, GC-FID analysis. Tested on as received sample. In-house based on US EPA 8015.	40 mg/kg dry wt	49-51
Total hydrocarbons (C7 - C36)	Calculation: Sum of carbon bands from C7 to C36. In-house based on US EPA 8015.	70 mg/kg dry wt	49-51

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 30-Mar-2021 and 06-Apr-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

Kim Harrison MSc
Client Services Manager - Environmental

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Certificate of Analysis

Client:	Focus Environmental Services Limited	**Lab No:**	2570278	A2Pv2
Contact:	Joseph McLay	**Date Received:**	29-Mar-2021	
	C/- Focus Environmental Services Limited	**Date Reported:**	06-Apr-2021	**(Amended)**
	PO Box 11455	**Quote No:**	80876	
	Ellerslie	**Order No:**		
	Auckland 1542	**Client Reference:**	1443.009	
		Submitted By:	Joseph McLay	

Sample Type: Soil

Sample Name:		HB01 25-Mar-2021	HB02 25-Mar-2021	HB03 25-Mar-2021	HB04 25-Mar-2021	HB05 25-Mar-2021
Lab Number:		2570278.1	2570278.2	2570278.3	2570278.4	2570278.5
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form		-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
As Received Weight	g	614.7	558.0	582.0	539.9	634.0
Dry Weight	g	506.1	448.1	425.4	360.4	574.0
Moisture	%	18	20	27	33	9
Sample Fraction >10mm	g dry wt	6.9	42.7	0.5	12.8	7.8
Sample Fraction <10mm to >2mm	g dry wt	19.3	65.7	0.7	8.9	66.2
Sample Fraction <2mm	g dry wt	478.5	338.8	423.0	337.9	499.2
<2mm Subsample Weight	g dry wt	57.8	58.7	57.6	58.6	54.6
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Sample Name:		HB06 25-Mar-2021	HB08 25-Mar-2021	HB11 25-Mar-2021	HB13 25-Mar-2021	HB14 25-Mar-2021
Lab Number:		2570278.6	2570278.8	2570278.9	2570278.10	2570278.11
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Chrysotile (White Asbestos) detected.	Asbestos NOT detected.
Description of Asbestos Form		-	-	-	Loose fibres	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
As Received Weight	g	538.7	285.6	460.6	422.1	535.1
Dry Weight	g	373.8	239.3	393.3	361.3	344.0
Moisture	%	31	16	15	14	36

Sample Type: Soil						
Sample Name:		HB06 25-Mar-2021	HB08 25-Mar-2021	HB11 25-Mar-2021	HB13 25-Mar-2021	HB14 25-Mar-2021
Lab Number:		2570278.6	2570278.8	2570278.9	2570278.10	2570278.11
Sample Fraction >10mm	g dry wt	3.8	1.5	0.6	72.4	4.8
Sample Fraction <10mm to >2mm	g dry wt	30.3	3.5	14.4	52.5	10.2
Sample Fraction <2mm	g dry wt	338.3	232.8	376.8	235.0	327.8
<2mm Subsample Weight	g dry wt	51.2	55.1	54.9	54.1	58.2
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	0.00099	< 0.00001

Sample Name:		HB15 25-Mar-2021	HB16 25-Mar-2021	HB17 25-Mar-2021	HB18 25-Mar-2021	HB19 25-Mar-2021
Lab Number:		2570278.12	2570278.13	2570278.14	2570278.15	2570278.16
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form		-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
As Received Weight	g	457.6	411.7	500.5	564.6	365.8
Dry Weight	g	270.2	270.5	314.2	334.0	258.7
Moisture	%	41	34	37	41	29
Sample Fraction >10mm	g dry wt	3.4	30.5	< 0.1	< 0.1	3.1
Sample Fraction <10mm to >2mm	g dry wt	12.7	12.1	6.7	13.6	45.2
Sample Fraction <2mm	g dry wt	253.8	226.6	305.8	318.3	209.3
<2mm Subsample Weight	g dry wt	52.7	51.6	55.5	53.0	56.9
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Sample Name:		HB20 25-Mar-2021	HB21 25-Mar-2021	HB22 25-Mar-2021	ASB02 25-Mar-2021	
Lab Number:		2570278.17	2570278.18	2570278.19	2570278.20	
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Amosite (Brown Asbestos) and Chrysotile (White Asbestos) detected.	Asbestos NOT detected.	-
Description of Asbestos Form		-	-	Fibre cement and ACM debris	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	0.047	< 0.001	-
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	0.026	< 0.001	-
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	-
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	0.026	< 0.001	-
As Received Weight	g	412.0	516.1	872.8	977.4	-
Dry Weight	g	294.5	382.8	839.3	935.1	-
Moisture	%	29	26	4	4	-
Sample Fraction >10mm	g dry wt	13.5	2.1	297.9	156.7	-

Sample Type: Soil						
Sample Name:		HB20 25-Mar-2021	HB21 25-Mar-2021	HB22 25-Mar-2021	ASB02 25-Mar-2021	
Lab Number:		2570278.17	2570278.18	2570278.19	2570278.20	
Sample Fraction <10mm to >2mm	g dry wt	81.9	69.6	281.4	344.1	-
Sample Fraction <2mm	g dry wt	198.3	310.2	259.2	433.3	-
<2mm Subsample Weight	g dry wt	52.3	50.4	59.3	54.2	-
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	0.3985	< 0.00001	-
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	-
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	0.2196	< 0.00001	-

Glossary of Terms

• Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
• Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
• ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
• ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
• Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
• Trace - Trace levels of asbestos, as defined by AS4964-2004.
For further details, please contact the Asbestos Team.

Please refer to the BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil.
https://www.branz.co.nz/asbestos

The following assumptions have been made:

1. Asbestos Fines in the <2mm fraction, after homogenisation, is evenly distributed throughout the fraction
2. The weight of asbestos in the sample is unaffected by the ashing process.

Results are representative of the sample provided to Hill Laboratories only.

Analyst's Comments

Amended Report: This certificate of analysis replaces report '2570278-A2Pv1' issued on 31-Mar-2021 at 4:25 pm.
Reason for amendment: Updated client reference as per request.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
Wgt of Asbestos as Asbestos Fines in <10mm >2mm Fraction*	Measurement on analytical balance, from the <10mm >2mm Fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.00001 g dry wt	1-6, 8-20
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-6, 8-20
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-6, 8-20
Moisture	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1-6, 8-20
Sample Fraction >10mm	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1-6, 8-20
Sample Fraction <10mm to >2mm	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1-6, 8-20
Sample Fraction <2mm	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1-6, 8-20
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-6, 8-20

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1-6, 8-20
Weight of Asbestos in ACM (Non-Friable)	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-6, 8-20
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-6, 8-20
Weight of Asbestos as Fibrous Asbestos (Friable)	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-6, 8-20
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-6, 8-20
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-6, 8-20
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-6, 8-20
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-6, 8-20

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed on 31-Mar-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

Dexter Paguirigan Dip Chem Engineering Tech
Laboratory Technician - Asbestos

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Certificate of Analysis

Client:	Focus Environmental Services Limited	**Lab No:**	2578950	A2Pv1
Contact:	Joseph McLay	**Date Received:**	08-Apr-2021	
	C/- Focus Environmental Services Limited	**Date Reported:**	12-Apr-2021	
	PO Box 11455	**Quote No:**	80876	
	Ellerslie	**Order No:**		
	Auckland 1542	**Client Reference:**	1443.009	
		Submitted By:	Joseph McLay	

Sample Type: Soil

Sample Name:		HB09 29-Mar-2021	HB10 29-Mar-2021	HB12 29-Mar-2021		
Lab Number:		2578950.1	2578950.2	2578950.3		
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.	-	-
Description of Asbestos Form		-	-	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	-	-
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	-	-
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	-	-
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	-	-
As Received Weight	g	444.8	493.0	908.9	-	-
Dry Weight	g	325.7	362.1	768.0	-	-
Moisture	%	27	27	15	-	-
Sample Fraction >10mm	g dry wt	0.3	< 0.1	140.2	-	-
Sample Fraction <10mm to >2mm	g dry wt	93.3	34.5	347.0	-	-
Sample Fraction <2mm	g dry wt	231.6	327.1	280.8	-	-
<2mm Subsample Weight	g dry wt	57.5	53.2	57.6	-	-
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	-	-
Weight of Asbestos as Fibrous Asbestos (Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	-	-
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	-	-

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Please refer to the BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil.
https://www.branz.co.nz/asbestos

The following assumptions have been made:

1. Asbestos Fines in the <2mm fraction, after homogenisation, is evenly distributed throughout the fraction
2. The weight of asbestos in the sample is unaffected by the ashing process.

Results are representative of the sample provided to Hill Laboratories only.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Wgt of Asbestos as Asbestos Fines in <10mm >2mm Fraction*	Measurement on analytical balance, from the <10mm >2mm Fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.00001 g dry wt	1-3
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-3
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-3
Moisture	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1-3
Sample Fraction >10mm	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1-3
Sample Fraction <10mm to >2mm	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1-3
Sample Fraction <2mm	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g dry wt	1-3
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-3
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1-3
Weight of Asbestos in ACM (Non-Friable)	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3
Weight of Asbestos as Fibrous Asbestos (Friable)	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-3
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed on 12-Apr-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Rhodri Williams BSc (Hons)
Technical Manager - Asbestos

Hill Laboratories
TRIED, TESTED AND TRUSTED

R J Hill Laboratories Limited
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Hamilton 3240 New Zealand

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Certificate of Analysis

Client:	Focus Environmental Services Limited	**Lab No:**	2572044	SPv2
Contact:	Joseph McLay	**Date Received:**	30-Mar-2021	
	C/- Focus Environmental Services Limited	**Date Reported:**	06-Apr-2021	**(Amended)**
	PO Box 11455	**Quote No:**	80876	
	Ellerslie	**Order No:**		
	Auckland 1542	**Client Reference:**	1443.009	
		Submitted By:	Joseph McLay	

Sample Type: Soil

	Sample Name:	HB09 29-Mar-2021	HB10 29-Mar-2021	HB12 29-Mar-2021		
	Lab Number:	2572044.1	2572044.2	2572044.3		
Total Recoverable Lead	mg/kg dry wt	50	70	52	-	-

Analyst's Comments

Amended Report: This certificate of analysis replaces report '2572044-SPv1' issued on 01-Apr-2021 at 2:25 pm.
Reason for amendment: Updated client reference as per request.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-3
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation May contain a residual moisture content of 2-5%.	-	1-3
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1-3
Total Recoverable Lead	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.4 mg/kg dry wt	1-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed on 01-Apr-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

Kim Harrison MSc
Client Services Manager - Environmental

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Certificate of Analysis

Client:	Focus Environmental Services Limited	**Lab No:**	2570524	A2Pv2
Contact:	Joseph McLay	**Date Received:**	29-Mar-2021	
	C/- Focus Environmental Services Limited	**Date Reported:**	06-Apr-2021	**(Amended)**
	PO Box 11455	**Quote No:**	80876	
	Ellerslie	**Order No:**		
	Auckland 1542	**Client Reference:**	1443.009	
		Submitted By:	Joseph McLay	

Sample Type: Building Material

Sample Name	Lab Number	Sample Category	Sample Weight on receipt (g)	Asbestos Presence / Absence	Description of Asbestos in Non Homogeneous Samples
PACM02	2570524.1	Fibre Cement	33.98	Amosite (Brown Asbestos) detected. Chrysotile (White Asbestos) detected.	-

Glossary of Terms

• Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
• Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
• ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
• ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
• Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
• Trace - Trace levels of asbestos, as defined by AS4964-2004.
For further details, please contact the Asbestos Team.

Analyst's Comments

Amended Report: This certificate of analysis replaces report '2570524-A2Pv1' issued on 30-Mar-2021 at 11:36 am.
Reason for amendment: Updated client reference as per request.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Building Material

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Bulk Material			
Sample Category	Assessment of sample type. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	-	1
Sample Weight on receipt	Sample weight. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.01 g	1
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1
Description of Asbestos in Non Homogenous Samples	Form, dimensions and/or weight of asbestos fibres present. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	-	1

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Dates of testing are available on request. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

Dexter Paguirigan Dip Chem Engineering Tech
Laboratory Technician - Asbestos

DETAILED SITE INVESTIGATION
REMEDIATION ACTION PLAN
&
ASSESSMENT OF ENVIRONMENTAL EFFECTS
279 AIRFIELD ROAD
ARDMORE
AUCKLAND

For the Attention of:

Winton Land Limited

Reference: FES 1686.001 December 2023 (R1)

Company Information

Focus Environmental Services Limited

PO Box 11455

Ellerslie

Auckland 1542

Telephone: +64 9 579 4155

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Quality Information

Project Name	DSI, RAP & AEE 279 Airfield Road, Ardmore, Auckland
Project Number	1686.001 (R1)
File Reference	M:\2023 Jobs\Winton\Sunfield Development\Completed Reports\279 Airfield Road, Ardmore - PSI\01 Report\R1\1686.001_DSI_RAP_AEE_MT (R1).docx
Date Issued	September 2022
Date Revised	December 2023

Author

Megan Thomas
Environmental Scientist

Reviewed

Claire Johnson
Environmental Scientist

Authorised

David O'Reilly
Principal Environmental Consultant

Distribution List

Parties	Copies
Winton Land Limited	1
Focus Environmental Services Limited	1

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Executive Summary

This Focus Environmental Services Limited report is produced under a management system certified as complying with ISO 45001:2018 by SGS New Zealand.

Focus Environmental Services Limited was contracted by Winton Land Limited to carry out a Detailed Site Investigation, Remediation Action Plan and Assessment of Environmental Effects (DSI, RAP & AEE) at 279 Airfield Road, Ardmore, Auckland. The legal description of the site is Lot 2 BLK XV DP 199521 with an area of 14.42 ha.

It should be noted that this report has been revised following the request of the client.

The Sunfield Urban Development Area (UDA) consists of nineteen properties located across Cosgrave Road, Old Wairoa Road, Hamlin Road and Airfield Road, Papakura, Auckland.

The scope of this report is limited to the property at 279 Airfield Road, Ardmore and should be read in conjunction with the cover letter summarising the findings of the PSIs and DSIs completed for the Sunfield UDA.

This DSI, RAP & AEE has been prepared in accordance with the requirements of the Contaminated Land Management Guidelines No. 1 and No. 5 (Ministry for the Environment, Revised 2021).

It is proposed that the site will be subdivided into residential lots. As part of the redevelopment, the site will undergo a change of land use, subdivision and disturbance of soils, therefore the rules of the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health apply. The guideline values of the Soil Contaminant Standards for health ($SCSs_{(health)}$) for residential land use (10% produce consumption) as outlined in the NES are considered relevant. Additionally, in order to accurately perform a risk assessment and to assess whether any discharges from contaminated land will result in significant adverse effects on the environment, the contaminated land rules as outlined in Chapter E30 of the Auckland Unitary Plan: Operative in Part (AUP: OP) also require consideration.

The history of the site was researched by Focus Environmental Services personnel, which involved a review of the available historical aerial photographs of the site, a search of the Auckland Council property file, a contaminated sites enquiry to Auckland Council and a review of the historical certificate of tile.

During the review of the available information, it was noted that due to the age of the current and former site buildings there was potential for ground contamination from the historic use of lead-based paints and potentially asbestos containing building materials. In addition, historical horticulture land use was noted on neighbouring properties, therefore contamination associated with spray-drift may have occurred at the site.

The site was visited and a site inspection and walk over was carried out by Focus Environmental Services Limited personnel on 15th of August 2022. During the site inspection, potential spray race operations, two areas of refuse burning and three areas of potential asbestos containing materials in a degraded condition were noted.

Due to the potential sources of contamination identified it is considered that there is evidence to suggest that an activity outlined in the Hazardous Activities Industries List (HAIL) has been, or is more likely than not to have been undertaken at the site.

Following the site inspection and walkover, the intrusive investigation was carried out by Focus Environmental Services Limited personnel where a total of twenty-one discrete surface soil samples were taken from the potential sources of contamination identified.

In addition, twelve samples were taken from the areas of horticultural activity and composited at the laboratory to form three composite samples (4:1). Furthermore, three bulk asbestos samples were collected from areas of potentially asbestos containing materials observed in a degraded condition.

The samples were analysed for contaminants that could be present due to the potentially hazardous activities carried out at the site. The results of the site investigation have indicated that the activities carried out at the site have impacted the site soils.

Elevated concentrations of arsenic, cadmium, lead and zinc were detected in the site soils in the locations of the two burn piles. In addition, elevated concentrations of arsenic were detected in the spray race/stock loading area (2). Elevated concentrations of lead were detected in the areas around the stables (2), HB05 and the dwelling (1). Furthermore, elevated concentrations of asbestos fibres and visual evidence of asbestos were identified in the area of the outdoor toilet, and visual evidence of asbestos was observed in contact with the soils on the northern side of the stables (2).

Concentrations of arsenic, cadmium, lead and zinc were detected in the site soils in two locations at levels elevated above the $SCSs_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES and/or the discharge criteria as outlined in the AUP: OP.

Concentrations of arsenic were detected in another location at levels elevated above the $SCSs_{(health)}$ for residential land use as outlined in the NES.

In addition, concentrations of lead were detected in the site soils in two areas at levels elevated above the $SCSs_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES and/or the discharge criteria as outlined in the AUP: OP.

Furthermore, visual evidence of asbestos containing material was observed in contact with the site soils in two locations, and concentrations of asbestos fibres was detected in one of these areas at levels above the adopted human health criteria.

Due to the elevated levels of arsenic, cadmium, lead, zinc and asbestos fibres detected, the site at 279 Airfield Road, Ardmore will require remediation of the affected soils prior to being redeveloped. The estimated volume of soil requiring remediation is 58.4m^3. It should be noted that this volume may change during the remedial process.

A restricted discretionary consent is required under Regulation 10 of the NES as the proposed subdivision, change of use and disturbance of soils do not meet the requirements of a permitted activity under Regulation 8 of the NES, and as this detailed site investigation for the piece of land has shown that the soil contamination does exceed the applicable standard for residential land use.

Due to the estimated volume of material containing concentrations of contaminants elevated above those values specified in Table E30.6.1.4.1 of Chapter E30 of the AUP: OP being 35.94m^3, which is below 200 m^3, it is considered that the proposed remediation will likely meet the permitted activity requirements under rule E30.6.1.2 of the AUP: OP and therefore resource consent under the AUP: OP may not be required.

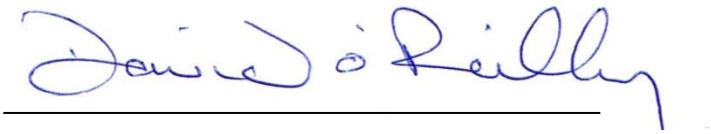
In addition, due to low-level concentrations of lead and residual concentrations of organochlorine pesticides detected above natural background concentrations in localised areas of the site, the soils in these areas will require management during development works, and if removed from site, will require disposal to a suitably licensed managed fill facility.

The objective of this Remediation Action Plan is to ensure that the soils contaminated above the adopted site assessment criteria and the materials contaminated above natural

background concentrations in the management areas of the site, are handled, removed, or managed in a controlled manner, and disposed of to a suitable disposal location. All earthworks required as part of the remedial works should be carried out in accordance with this Remediation Action Plan.

An assessment of the effects which may occur as a result of the proposed works has been made in order to mitigate any potential adverse environmental and/or human health effects. If the controls outlined in this Remediation Action Plan are implemented during the development works it is considered that the effects on the environment and human health are likely to be effectively mitigated.

This report is certified by David O'Reilly, Suitability Qualified and Experienced Practitioner (SQEP):



Principal Environmental Consultant
Focus Environmental Services Limited

1.0 Scope

1.1 This report has been prepared at the request of Winton Land Limited ("the Client") in terms of the Focus Environmental Services Limited Agreement ("Agreement").

1.2 The following report is based on:

- *Information provided by the Client*
- *A review of historical aerial photographs available for the site;*
- *A search of the Auckland Council Property File;*
- *A search of the Auckland Council Contaminated Sites Database;*
- *A review of the Historical Certificate of Title;*
- *A site walkover and inspection; and*
- *Site investigation and soil sampling.*

1.3 We have not independently verified the information provided to us by the Knight Investment Limited Ltd or its completeness. We do not express an opinion on the accuracy or the reliability of such information.

1.4 No warranties are given, intended or implied.

1.5 Opinion, inferences, assumptions and interpretations made in this report should not be construed as legal opinion.

1.6 Where an assessment is given in this report, the Client must also rely upon their own judgement, knowledge and assessment of the subject of this report before undertaking any action.

1.7 This report must not be used in any other context or for any other purpose other than that for which it has been prepared without the prior written consent of Focus Environmental Services Limited.

1.8 This report is strictly confidential and intended for the sole use of the Client and shall not be disclosed without the prior written consent of Focus Environmental Services Limited.

1.9 This Focus Environmental Services Limited report is produced under a management system certified as complying with ISO 45001:2018 by SGS New Zealand.

2.0 Site Identification

The property is located at 279 Airfield Road, Ardmore, Auckland as shown in Figure 1 attached. The legal description of the site is Lot 2 BLK XV DP 199521 with an area of 14.42 ha. The site is located at national grid reference 1774133mE and 5899713mN.

The site is irregular in shape and is zoned 'Rural – Mixed Rural Zone' under the Auckland Unitary Plan: Operative in Part.

The site location plan is presented as Figure 1.

3.0 Proposed Site Redevelopment Activity

It is proposed that the site will be redeveloped for residential purposes. As part of the redevelopment, the site will undergo subdivision, a change of land use and disturbance of soils.

The illustrative masterplan is attached as Appendix A.

4.0 Site Topography

The property at 279 Airfield Road, Ardmore had a relatively flat, level landscape.

The site contour plan is presented in Appendix B.

5.0 Geology and Hydrology

Published geological maps[1] indicate the site is typically underlain with non-volcanic turbidite deposits of the Puketoka Formation. A description of the underlying geology is presented in Table 1 below.

Table 1: Geology: 279 Airfield Road, Ardmore

Key name	Late Pliocene to Middle Pleistocene pumiceous river deposits
Simple name	Neogene sedimentary rocks
Main rock name	Sand
Description	Pumiceous mud, sand and gravel with muddy peat and lignite: rhyolite pumice, including non-welded ignimbrite, tephra and alluvia
Subsidiary rocks	Mud gravel peat lignite tephra pumice
Key group	Late Pliocene to Middle Pleistocene sediments
Stratigraphic lexicon name	Puketoka Formation
Absolute age (min)	0.071 million years
Absolute age (max)	3.6 million years
Rock group	Sandstone
Rock class	Clastic sediment

No groundwater investigation was carried out as part of this investigation.

The nearest surface water body is an unnamed tributary of the Papakura Stream which lies approximately 715m north east of the subject site.

[1] Geology of the Auckland Area (Institute of Geological &Nuclear Sciences 1:250,000 geological map 3, 2011)

6.0 Regulatory Framework

6.1 The National Environmental Standard

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES) came into effect on the 1st of January 2012 and supersedes any District Plan rules that related to contaminated land. Any Regional Plan rules relating to contaminated land are still applicable.

In brief, the objective of the NES is to ensure that land affected by contaminants is identified and assessed and, if necessary, remediated or managed to protect human health. The NES only applies to the activities: removing or replacing all, or part of, a fuel storage system; sampling the soil; disturbing the soil; subdividing the land; and changing the land use, and where an activity or industry described in the Hazardous Activities and Industries List (HAIL) is being, has been, or is more likely than not to have been undertaken on the piece of land.

The NES also contains reference to the soil contaminant standards for human health ($SCS_{(health)}$), for a variety of land use scenarios along with reference to best practice reporting documents.

The environmental HAIL is attached as Appendix C.

6.2 Auckland Unitary Plan: Operative in Part

The contaminated land rules of the Auckland Unitary Plan: Operative in Part (AUP: OP) have immediate legal effect following its notification. As the AUP: OP was notified on the 15th of November 2016 the contaminated land rules of the AUP: OP must be considered.

In brief, the objective of the AUP: OP is to manage land containing elevated levels of contaminants to protect human health and the environment and to enable the effective use of the land.

The contaminated land rules of the AUP: OP apply when the land contains contaminants above those levels specified in Table E30.6.1.4.1 of Chapter E30 of the AUP: OP.

7.0 Site History

The history of the site was researched by Focus Environmental Services Limited personnel, which involved a review of the available historical aerial photographs of the site, a search of the Auckland Council property file, a contaminated sites enquiry to Auckland Council and a review of the historical certificate of title.

7.1 Historical Aerial Photographs

Descriptions of the historical aerial photographs for the subject site are presented in Table 2 below. The historical aerial photographs are presented in Appendix D.

Table 2: Historical Photographs: 279 Airfield Road, Ardmore

Date	Description
1939	The 1939 historical photograph shows the subject site potentially forming a larger parcel of land, in use for rural purposes. A shed (HB01) can be seen along the southern boundary of site, in the central southern portion, in addition to anther shed (HB02) slightly north of this. Dwelling (1) can be seen in the south eastern quadrant of the site, adjacent to the eastern boundary, with what appears to be a small garage (HB05) directly to the north of the dwelling. A larger shed (stables 1) can be seen slightly further north of this again. Airfield Road can be seen directly to the north of the subject site The neighbouring property to the north east is in use for horticultural purposes, while the remaining properties appear to be in use for rural purposes.
1959 & 1960	The 1959 and 1960 historical photographs show that two further sheds (HB03 & HB04) have now been constructed in the central southern portion of the site. An access road can be seen running from Airfield Road along the western boundary for the site, and into the southern central portion of the site, leading to HB01. An additional access road can be seen running along the eastern boundary of the site to the dwelling (1) in the central portion of the site. Directly opposite the dwelling a large garage (1) has been constructed along the eastern boundary. A small shed (HB06) can be seen in the central eastern portion of the site, adjacent to a hedge-row which runs east to west through the centre of the site. The site continues to be in use for rural purposes, as does the surrounding environment. Ardmore Airport can be seen to the east of the subject site and a horse training track on the property to the north.
1975, 1981 & 1988	The 1975 historical photograph shows an access road has been constructed leading from Airfield Road to a turning area in the northern portion of the site, adjacent to a shed (3). Historical buildings HB02, HB03 & HB04 have now all been removed. The 1981 historical photograph shows the addition of two further sheds (1 & 2) in the northern portion of the site adjacent to the access road. Historical buildings HB05 & HB06 have now been removed. The 1988 historical photograph, shows the subject site much the same as the 1981 photograph, however HB01 has now also been removed. The subject site and surrounding environment continue to be in use for rural purposes.
2001, 2006, 2010, 2015 & 2017	The 2001 historical photograph shows the addition of a large shed (stables 2) north of stables (1), and the addition of a dwelling (2) and garage (2) in the south eastern corner of the site. No significant changes can be seen throughout the 2006 -2017 historical photographs. The site continues to be in use for rural purposes, while the neighbouring property to the west is in use for horticultural purposes. The wider surrounding environment is in use for a mix of rural/residential purposes.

Due to the age of the current and former site buildings (pre-2001) there is the potential for lead-based paint and asbestos containing materials (ACM) to have been used on the

external building materials, and therefore there is the potential for lead and asbestos contamination to be present in the soils surrounding the site buildings.

The site features plan is shown in Figures 2, 2-1 & 2-2 attached.

7.2 Previous Investigations

There are no previous environmental investigations relating to soil or groundwater contamination associated with the site at 279 Airfield Road, Ardmore on file with Auckland Council.

7.3 Auckland Council Property File Search

The results of the council search showed one resource consent for 279 Airfield Road, Ardmore. The relevant details of the property file search are presented in Table 3 below.

Table 3: Relevant Property File Information: 279 Airfield Road, Ardmore.

Proposed Activity	Applicant	Reference	Date
Right of Way Easement	Michael Drennan	LUC 7222 16/03/087	03/12/2003

7.4 Historical Certificate of Title Review

The historical certificate of title review was completed for the property at 279 Airfield Road, Ardmore.

Following the review of the historical certificate of title no companies/entities were listed that would suggest that the site has been utilised for an activity described in the HAIL.

The historical certificate of title is presented in full as Appendix E.

7.5 Auckland Council Site Contamination Enquiry

An enquiry with Auckland Councils Contamination, Air & Noise Team of the Resource Consent Department did not reveal any contamination issues in relation to the site at 279 Airfield Road, Ardmore. However foul animal manure odours were reported from the neighbouring property at 323 Airfield Road, Ardmore.

The Auckland Council Site Contamination Enquiry is presented in full as Appendix F.

8.0 Site Walkover and Inspection

The site inspection and walk over was carried out by Focus Environmental Services Limited personnel on the 15th of August 2022. The site inspection was carried out during a period of fine weather.

The site was accessed from Airfield Road in the northern area of the site via a gravel driveway leading to a turning area.

An excavated pit containing concrete and minor potentially asbestos containing material (PACM) fragments was located to the east of the driveway.

To the south of the excavated pit, a corrugated metal shed (1) was located. A portion of the wall on the northern side was painted. It was in use for the storage of hay on exposed ground.

Directly adjacent to shed (1), a carport and painted corrugated metal shed (2) was located. It was in use for the storage of hay and farming equipment on exposed ground.

To the south of the sheds, a concrete lined livestock loading area (1) was located with attached livestock shed. The livestock shed was constructed of unpainted concrete and cinderblock. The base was concrete lined.

A toilet constructed of unpainted plywood and PACM cladding was located to the south of the livestock shed. Minor damage was observed to the PACM cladding with fragments visible on the ground both on the exterior and interior of the toilet.

To the east of the toilet a livestock spray race/loading area (2) was present.

In the centre of the turning area a burn/refuse pit was located. It was comprised of vegetation, hay, tyres, brick, plastics and general rubbish.

The stables (1) were constructed of unpainted corrugated metal and concrete lined, and were located in the eastern portion of the site.

To the south of the stables (1) was a second stable building (2) constructed of painted PACM and metal cladding. A horse arena was located to the west of the stables.

A concrete driveway extended from the northern portion of the site to the central portion along the eastern boundary. A shipping container was located at the end of the concrete driveway.

A garage (1) constructed of painted corrugated metal with a concrete lining was located close to the eastern boundary of the site. A raised single storey dwelling (1) constructed of PACM baseboards and soffits with painted wooden cladding was located in the same area of the site.

A small burn barrel was located in the yard area of the dwelling (1), with burnt wood and aluminium cans observed.

In the south-eastern area of the site a painted metal clad garage (2) was located.

A raised single storey dwelling (2) constructed of painted PACM baseboards and metal cladding was located to the west of the garage (2). In the south-western portion of the yard area a septic tank vent was located.

The remainder of the site was comprised of paddocks and farm tracks.

Site inspection photographs are presented in Appendix G.

9.0 Surrounding Environment

The surrounding environment appeared to be rural residential in use. The neighbouring property to the west appeared to be in use for horticultural purposes.

The surrounding environment is presented in Figure 3.

10.0 Asbestos Management

External PACM products of the site structures are likely restricted to the exterior toilet cladding, the exterior cladding of the stables (2), the baseboards and soffits of dwelling (1), and the baseboards of dwelling (2). With the exception of the exterior toilet cladding, and exterior cladding of the stables (2), these materials appeared painted and in relatively good condition, and are considered unlikely to present as a source of ground contamination in their current state.

Any removal of asbestos materials from the site will need to be conducted in accordance with the Health and Safety at Work (Asbestos) Regulations (MBIE, 2016) and the Approved Code of Practice for the Management and Removal of Asbestos (WorkSafe New Zealand, 2016) by a licensed asbestos removals specialist under an approved asbestos removal control plan.

It should be noted that ACM, other than that described, may also be present at the site and a thorough inspection should be carried out by a suitably qualified and competent asbestos surveyor prior to any demolition activities at the site.

11.0 Potentially Contaminating Activities or Land Uses

Following a review of the history and the available information relating to the subject site, potentially contaminating activities were identified and are outlined in Table 4 below.

Table 4: Potentially Contaminating Activities and/or Land Uses: 279 Airfield Road, Ardmore.

Activity Description	HAIL Category
Spray Drift from Neighbouring Historic Horticultural Activities	A10
Livestock Dip or Spray Race Operations	A8
Demolition of Historic Structures Potentially Containing Asbestos, Products Potentially Containing Asbestos in a Degraded Condition, and Potentially Asbestos Containing Material intermixed with the Site Soils	E1
Maintenance and Use of Lead-based Paint	I
Burning of Refuse	

It is recommended that the septic tank present onsite is to be removed by a trained operator in accordance with industry best practice. Additionally, the contaminants of concern associated with domestic tanks are primarily microbiological (E.Coli and Faecal Coliforms) and, if present in the soils surrounding the tank, are likely to naturally attenuate following the removal of the septic tank, and therefore pose no long term risk to human health or the environment.

12.0 Conceptual Model of Exposure Pathways

The preliminary conceptual site model provided in Table 5 below expands on the potential sources of contamination (as identified above) and exposure pathways and was based on the potential effects of the proposed subdivision, change of use and soil disturbance activities on human health and the environment.

Table 5: Preliminary Conceptual Site Model: 279 Airfield Road, Ardmore.

Potential Source	Potential Pathways	Potential Receptors	Assessment
Contaminated Soil	Dermal Contact with Contaminated Soils	Human Health – Residential Land Use	Potentially Complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.
		Human Health – Commercial/Industrial Outdoor Worker	Potentially Complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.
	Ingestion of Contaminated Soils	Human Health – Residential Land Use	Potentially Complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.
		Human Health – Commercial/Industrial Outdoor Worker	Potentially Complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.
	Inhalation of Vapours/Fibres	Human Health – Residential Land Use	Potentially Complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.
		Human Health – Commercial/Industrial Outdoor Worker	Potentially Complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.
	Surface Water Run-off	Ecological Receptors - Unnamed Tributary of Papakura Stream	Potentially Complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.
	Migration of Groundwater	Ecological Receptors - Unnamed Tributary of Papakura Stream	Potentially Complete: Sampling and analysis is recommended to confirm the concentrations of contaminants in soil.

13.0 Sampling and Analysis Plan and Sampling Method

Environmental Sampling was carried out in accordance with the Contaminated Land Management Guidelines No. 5 (MfE, revised 2021).

A total of twenty-one discrete samples, three (4:1) laboratory composite samples and three bulk asbestos samples were collected from across the site and were sent under full chain of custody documentation to an IANZ accredited laboratory. Sampling and Analysis information is provided in Table 6 below.

Table 6: Discrete Sample Analysis Information: 279 Airfield Road, Ardmore.

Sample Name	Sample Depth	Number of Samples	HAIL Activity	Analysis Suite
Pb01-Pb10	0 - 0.15m	10	Application of Lead Based Paint	• Total recoverable lead
HB01-HB05	0 – 0.15m	5	Application of Lead Based Paint	• Total recoverable lead
			Demolition of Historical Structures Potentially Containing Asbestos	• Semi-quantitative asbestos in soil (BRANZ)
BP01 & BP02	0 - 0.15m	2	Burning of Refuse	• Total recoverable arsenic, cadmium, chromium, copper, lead, nickel, zinc; and • Polycyclic aromatic hydrocarbons
SR01	0 - 0.15m	1	Potential Spray Race Operations	• Total recoverable arsenic; and • Organochlorine pesticides.
ASB01-ASB03	0 - 0.15m	3	Products Potentially Containing Asbestos in a Degraded Condition, and Potentially Asbestos Containing Material intermixed with the Site Soils	• Semi-quantitative asbestos in soil (BRANZ)
PACM01-PACM03	-	3		• Asbestos in bulk materials - presence/absence
COMP01 A-D, COMP02 A-D, COMP03 A-D	0 - 0.15	3	Spray Drift from Historical Horticulture	• Total recoverable arsenic, copper, lead; and • Organochlorine pesticides.

In addition, two samples (Pb01 & Pb10) were selected at random and duplicated for quality control purposes. This is discussed further in Section 17.

The sample location plans are presented as Figures 4, 4-1, 4-2 & 4-3.

14.0 Field Sampling Quality Assurance

All sampling implements were triple washed between samples using clean tap water, followed by a solution of laboratory grade phosphate free detergent (Decon 90), and a final rinse with water.

Clean, nitrile gloves were worn when handling each sample. Samples were stored in laboratory cleaned glass jars or laboratory supplied 500ml plastic containers and immediately placed in an iced cooler. The samples were transported under chain of custody documentation to an IANZ accredited laboratory for analysis.

15.0 Laboratory Quality Assurance

Routine laboratory quality assurance procedures include analysis of laboratory blanks and spiked samples. All analyses were carried out using industry standard methods as follows:

- Total Recoverable Metals – Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2 Complies with NES Regulations. ICP -MS Screen level, interference removed by Kinetic Energy Discrimination if required.
- Polycyclic Aromatic Hydrocarbons - Sonic extraction, GC-MS analysis. Tested on as received sample. In house based on US EPA 8270.
- Organochlorine Pesticides – Sonic extraction, GC-ECD analysis. Tested on as received sample. In house based on US EPA 8081.
- Asbestos Presence/Absence – AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.
- Asbestos Semi-Quantitative – Calculated from weight of fibrous asbestos plus asbestos fines, weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.

16.0 Basis for Guideline Values

It is proposed that the site will be developed for residential purposes, therefore the guideline values of the Soil Contaminant Standards for health ($SCSs_{(health)}$) for residential land use (10% produce consumption) as outlined in the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES), and the discharge criteria of the Auckland Unitary Plan: Operative in Part (AUP: OP) are considered relevant and have been adopted as the site assessment criteria.

Furthermore, due to the underlying non-volcanic geology at the site, the concentrations of heavy metals detected will be compared to the maximum background levels for non-volcanic soils in Auckland[2] (TP153). The relevant values of the above guidelines have been reproduced in Table 7 below.

Table 7: Site Assessment Criteria: 279 Airfield Road, Ardmore (mg/kg).

Parameter	NES $SCSs_{(health)}$	AUP: OP	TP153 (Non-volcanic)
Arsenic	20	100	12
Cadmium	3	7.5	0.65
Chromium	460	400	55
Copper	NL	325	45
Lead	210	250	65
Nickel	400[1]	105	35
Zinc	7,400[1]	400	180
BaP eq.	10	20	-
Total DDT	70	12	-
Dieldrin	2.6	0.5[2]	-
Asbestos (FA/AF)	0.001%[3] / 0.01%[4]	-	-
Visual ACM	No Visual Evidence of ACM[5]	-	-

Note: NL = Not Limited. This is where the derived values exceed 10,000mg/kg; 1. = No $SCSs_{(health)}$ given, guideline values derived in accordance with the Contaminated Land Management Guidelines number 2 – Hierarchy and Application in New Zealand of Environmental Guideline Values (MfE, 2011), and taken from the National Environment Protection (Assessment of Site Contamination) Measure 1999 for Residential land use; 2 = Soil Guideline Values to protect on-site ecological receptors taken from Ministry for the Environment Guidelines for identifying, investigating and managing risks associated with former sheep dip sites, November 2016; 3 = Soil guideline values for asbestos in Soil of 0.001% combined fibrous asbestos and asbestos fines (FA/AF), taken from the New Zealand Guidelines for Assessing and Managing Asbestos in Soil (BRANZ Limited, 2017); 4= Soil guideline values for asbestos in Soil of 0.01% asbestos containing material (ACM), taken from the New Zealand Guidelines for Assessing and Managing Asbestos in Soil (BRANZ Limited, 2017); 5 = No visual Evidence of asbestos containing material in the upper 0.1m of soil in accordance with New Zealand Guidelines for Assessing and Managing Asbestos in Soil (BRANZ Limited, 2017).

Furthermore, the natural background levels of polycyclic aromatic hydrocarbons, organochlorine pesticides, and asbestos fibres are considered to be below the analytical

[2] Background Concentrations of Inorganic Elements in Soils from the Auckland Region, Technical Publication No.153, Auckland Regional Council, 2001.

levels of detection and hence the detection of these analytes would restrict material from being classified as cleanfill material.

17.0 Quality Control

17.1 Laboratory Verification

Two samples (Pb01 & Pb10) were selected at random for duplicate analysis and Relative Percentage Difference (RPD) calculations. It is considered that an RPD value of less than 30-50% is generally considered acceptable. If the results were below the laboratory detection limits the RPD was not calculated.

The results of the RPD analysis are presented in Table 8 below.

Table 8: RPD Summary: 279 Airfield Road, Ardmore.

Parameter	Pb01 (RPD %)	Pb10 (RPD %)
Lead	3.21	10.99

Note: Results in *Italics* exceed 30% RPD. Results in red exceed 50% RPD.

The RPD value calculated for lead in samples Pb01 and Pb10 were less than the acceptable range. Therefore, based on the results of the RPD analysis, the sample results are likely to be relatively consistent and repeatable.

The RPD calculations are presented as Appendix H.

18.0 Soil Sampling Results

Tabulated soil sampling results are presented in Tables 9 - 13 below and laboratory transcripts are provided in Appendix I.

18.1 Heavy Metals

Table 9: Heavy Metals Results: 279 Airfield Road, Ardmore (mg/kg).

Sample	As	Cd	Cr	Cu	Pb	Ni	Zn
Pb01	-	-	-	-	*95*	-	-
Pb02	-	-	-	-	25	-	-
Pb03	-	-	-	-	*81*	-	-
Pb04	-	-	-	-	*470*	-	-
Pb05	-	-	-	-	*116*	-	-
Pb06	-	-	-	-	***1,420***	-	-
Pb07	-	-	-	-	***1,730***	-	-
Pb08	-	-	-	-	33	-	-
Pb09	-	-	-	-	*113*	-	-
Pb10	-	-	-	-	*96*	-	-
HB01	-	-	-	-	61	-	-
HB02	-	-	-	-	34	-	-
HB03	-	-	-	-	32	-	-
HB04	-	-	-	-	23	-	-
HB05	-	-	-	-	***480***	-	-
BP01	*58*	*3.3*	*57*	*83*	*240*	10	***480***
BP02	*68*	*3.3*	54	*104*	***1,040***	33	***840***
SR01	*43*	-	-	-	-	-	-
Composite of COMP01A-D	5	-	-	19	22	-	-
Composite of COMP02A-D	4	-	-	16	23	-	-
Composite of COMP03A-D	5	-	-	29	28	-	-

Note: Results in red exceed the $SCS_{(health)}$ for residential land use. Results in **Bold** exceed the discharge criteria as outlined in the AUP: OP. Results in *Italics* exceed the maximum Auckland background concentrations for non-volcanic soils outlined in the Auckland Regional Council Technical Publication No.153, Oct 2001.

The concentrations of arsenic detected in samples BP01, BP02 and SR01 were elevated above the Auckland background concentrations for non-volcanic soils and the $SCS_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES.

The concentrations of cadmium detected in samples BP01 & BP02 were elevated above the Auckland background concentrations for non-volcanic soils and the $SCSs_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES.

The concentration of chromium detected in sample BP01 was elevated above the Auckland background concentrations for non-volcanic soils.

The concentrations of copper detected in samples BP01 & BP02 were elevated above the Auckland background concentrations for non-volcanic soils.

The concentrations of lead detected in Pb01, Pb03, Pb04, Pb05, Pb06, Pb07, Pb09, Pb10, HB05, BP01 and BP02 were all elevated above the Auckland background concentrations for non-volcanic soils. In addition, the concentrations of lead detected in samples Pb04, Pb06, Pb07, HB05, BP01 and BP02 were elevated above the $SCSs_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES. Furthermore, the concentrations of lead detected in samples Pb06, Pb07, HB05 and BP02 were elevated above the discharge criteria as outlined in the AUP: OP.

The concentrations of zinc detected in samples BP01 & BP02 were elevated above the Auckland background concentrations for non-volcanic soils and the discharge criteria as outlined in the AUP: OP.

The concentrations of all other heavy metals in all other samples were below the Auckland background concentrations for non-volcanic soils, the $SCSs_{(health)}$ residential land use (10% produce consumption) as outlined in the NES, and the discharge criteria as outlined in the AUP: OP.

18.2 Polycyclic Aromatic Hydrocarbons

Table 10: Polycyclic Aromatic Hydrocarbon Results: 279 Airfield Road, Ardmore (mg/kg).

Sample	BaP eq.
BP01	*<0.05**
BP02	*0.08*

Note: * = Residual levels of contaminants detected. Results in red exceed the $SCSs_{(health)}$ for residential land use. Results in **Bold** exceed the discharge criteria as outlined in the AUP: OP. Results in *Italics* exceed the cleanfill criteria.

Low-level concentrations of polycyclic aromatic hydrocarbons were detected in sample BP02, in addition to residual concentrations detected in sample BP01, both of which are above the analytical levels of detection.

The concentrations of polycyclic aromatic hydrocarbons detected in both samples were below the $SCSs_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES and the discharge criteria of the AUP: OP.

18.3 Organochlorine Pesticides

Table 11: Organochlorine Pesticides Results: 279 Airfield Road, Ardmore (mg/kg).

Sample	Total DDT	Dieldrin
SR01	*<0.13**	*<0.03**
Composite of COMP01A-D	<0.10	<0.016
Composite of COMP02A-D	<0.10	<0.016
Composite of COMP03A-D	*<0.11**	*<0.019**

Note: * = Residual levels of contaminants detected. Results in red exceed $SCSs_{(health)}$ for residential land use. Results in **Bold** exceed the discharge criteria as outlined in the AUP: OP. Results in *Italics* exceed the cleanfill criteria.

Residual concentrations of organochlorine pesticides were detected in samples SR01 and COMP03 A-D above the analytical levels of detection.

The concentrations of organochlorine pesticides detected in both samples were below the $SCSs_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES and the discharge criteria of the AUP: OP.

18.4 Asbestos

Table 12: Asbestos in Bulk Material Results: 279 Airfield Road, Ardmore.

Sample	Asbestos Type
PACM01	Asbestos Not Detected
PACM02	*Chrysotile (White Asbestos) Detected*
PACM03	*Chrysotile (White Asbestos) Detected*

Note: Results in red exceed the adopted human health criteria.

Asbestos was identified in both PACM02 & PACM03.

Table 13: Semi-quantitative Asbestos in Soil Results: 279 Airfield Road, Ardmore.

Sample	Asbestos Type	Asbestos (FA/AF %)	Asbestos (% ACM)
ASB01	Asbestos Not Detected	-	-
ASB02	*Chrysotile (White Asbestos) Detected*	*0.022*	*<0.001*
ASB03	Asbestos Not Detected	-	-
HB01	Asbestos Not Detected	-	-
HB02	Asbestos Not Detected	-	-
HB03	Asbestos Not Detected	-	-
HB04	Asbestos Not Detected	-	-
HB05	Asbestos Not Detected	-	-

Note: * = Residual levels of contaminants detected. Results in red exceed the adopted human health criteria. Results in *Italics* exceed the cleanfill criteria.

Elevated concentrations of asbestos fibres were detected in sample ASB02, above the adopted human health criteria, and therefore above the cleanfill criteria.

19.0 Extent of Contamination

The results of the sample analysis indicate that the site soils in the areas of the burn piles (BP01 & BP02) are contaminated above the $SCSs_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES for arsenic, cadmium and lead. In addition, the site soils in these areas are also contaminated above the discharge criteria of the AUP: OP for lead and zinc, therefore remediation of these areas are required (Areas 1 & 6).

The site soils in the area of the spray race/stock loading activities (2) (SR01) are contaminated above the $SCSs_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES for arsenic, and therefore this area requires remediation (Area 3).

Furthermore, the site soils in the areas of the stables (2) (Pb04), HB05, and the dwelling (Pb06 & Pb07), are contaminated above the $SCSs_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES for lead (Areas 5 & 7). In addition, the soils in the areas of HB05, Pb06 & Pb07 are also contaminated above the discharge criteria of the AUP: OP for lead (Area 7).

In addition, the site soils in the area of the outdoor toilet (ASB02) are contaminated above the adopted human health criteria for asbestos fibres, therefore remediation of this area is required (Area 2). Furthermore, visual evidence of asbestos containing material in the area of PACM03, will also require remediation (Area 4).

The estimated volume required to remove the contaminated soils from the site is presented in Table 14 below.

Table 14: Extent of Contamination: 279 Airfield Road, Ardmore.

Location	Area (m^2)	Depth (m)	Contaminant	Quantity (m^3)
Area 1	19	0.3	As, Cd, Pb, Zn	5.7
Area 2	8.4	0.3	Asbestos (Visual ACM & FA/AF)	2.52
Area 3	11.5	0.3	As	3.45
Area 4	10.8	SUR	Visual ACM	-
Area 5	54.9	0.3	Pb	16.47
Area 6	3.1	0.3	As, Cd, Pb, Zn	0.93
Area 7	97.7	0.3	Pb	29.31
Total Volume				58.38
Total Tonnes (m^3 x 1.5)				**87.6 t**

The inferred extent of the contaminated soil at the site is presented in Figures 5 & 5-1. This estimate is based on the sampling and results available following the site investigation and it should be noted that the volume may increase or decrease following inspection and validation sampling.

All contaminated materials removed from site will require disposal at a suitably licensed landfill facility.

19.1 Management Areas

Low-level contamination was detected in five areas of the site. Concentrations of lead were detected in four areas in exceedance of natural background concentrations, and one area contained residual organochlorine pesticides, therefore exceeding the clean fill criteria.

Any topsoil removed from these areas will require disposal to a suitably licensed managed fill facility, unless further sampling and analysis demonstrate otherwise.

The approximate areas of management are shown in Table 15 below.

Table 15: Management Areas – 279 Airfield Road, Ardmore (mg/kg).

Location	Area (m^2)	Depth (m)	Contaminant	Quantity (m^3)
Management Area 1	17.2	0.3	Pb	5.2
Management Area 2	5,284.4	0.3	OCP's	1,585.26
Management Area 3	20	0.3	Pb	6
Management Area 4	43.4	0.3	Pb	13.0
Management Area 5	52.2	0.3	Pb	15.6
Total Volume				1,625.1
Total Tonnes (m^3 x 1.5)				**2,437.6 t**

The inferred areas and depths requiring management are shown in Figures 6 & 6-1.

20.0 Revised Conceptual Model of Exposure Pathways

The revised conceptual site model provided in Table 16 below expands on the potential sources of contamination (as identified above), following sampling and analysis, and exposure pathways and was based on the potential effects of the proposed subdivision, change of use and soil disturbance activities on human health and the environment.

Table 16: Revised Conceptual Site Model: 279 Airfield Road, Ardmore

Potential Source	Potential Pathways	Potential Receptors	Assessment
Contaminated Soil	Dermal Contact with Contaminated Soils	Human Health – Residential Land Use	Complete: Remediation or management of the contaminated area required.
		Human Health – Commercial/Industrial Outdoor Worker	Incomplete: No exceedances of Commercial/Industrial Outdoor Worker
	Ingestion of Contaminated Soils	Human Health – Residential Land Use	Complete: Remediation or management of the contaminated area required.
		Human Health – Commercial/Industrial Outdoor Worker	Incomplete: No exceedances of Commercial/Industrial Outdoor Worker
	Inhalation of Vapours/Fibres	Human Health – Residential Land Use	Complete: Remediation or management of the contaminated area required.
		Human Health – Commercial/Industrial Outdoor Worker	Complete: Remediation or management of the contaminated area required.
	Surface Water Run-off	Ecological Receptors - Unnamed Tributary of Papakura Stream	Complete: Remediation or management of the contaminated area required.
	Migration of Groundwater	Ecological Receptors - Unnamed Tributary of Papakura Stream	Complete: Remediation or management of the contaminated area required.

21.0 Regulatory Requirements

21.1 The National Environmental Standard

Due to the potentially contaminating land uses identified above, it is considered that an activity described in the HAIL is being, has been, or is more likely than not to have been undertaken at the site.

Resource Consent will therefore be required for the site under the District Plan, following the introduction of the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES).

In reference to the NES the following assessment was made in determining the activity status of the proposed works:

- The land is covered by the NES under regulation 5.7(b) 'an activity or industry described in the HAIL has been undertaken on it'.
- The activity is changing the use of a piece of land under regulation 5(6) 'means changing it to a use that, because the land is described in subclause (7), is reasonably likely to harm human health'.
- The activity is subdividing land under regulation 5(5)(c) 'means subdividing land that has part if the piece of land within its boundaries'.
- The activity of changing use and subdivision does not comply with regulation 8(4).
- The activity is disturbing soil under regulation 5(4)(a) 'means disturbing the soil of the piece of land for a particular purpose'.
- The activity is unlikely to comply with regulation 8(3)(c) 'the volume of the disturbance of the soil of the piece of land must be no more than 25m^3 per 500m^2' and '…a maximum of 5 m^3 per 500 m^2 of soil may be taken away'.
- A detailed site investigation for the piece of land does exist.

A restricted discretionary consent is required under Regulation 10 of the NES as the proposed subdivision, change of use and disturbance of soil do not meet the requirements of a permitted activity under Regulation 8 of the NES, and as this detailed site investigation for the piece of land has shown that the soil contamination does exceed the applicable standard for residential land use.

21.2 Auckland Unitary Plan: Operative in Part

The contaminated land rules of the Auckland Unitary Plan: Operative in Part (AUP: OP) have immediate legal effect following its notification. As the AUP: OP was notified on the 15th of November 2016 the contaminated land rules must be considered.

The contaminated land rules of the AUP: OP apply when the land contains contaminants above those levels specified in Table E30.6.1.4.1 of Chapter E30 of the AUP: OP.

Due to the estimated volume of material containing concentrations of contaminants elevated above those values specified in Table E30.6.1.4.1 of Chapter E30 of the AUP: OP being 35.94m^3, which is below 200 m^3, it is considered that the proposed remediation will likely meet the permitted activity requirements under rule E30.6.1.2 of the AUP: OP and therefore resource consent under the AUP: OP may not be required.

22.0 Remediation Action Plan

This Remediation Action Plan & Assessment of Environmental Effects (RAP & AEE) provides the soil specific management controls to be implemented at the site to ensure that any adverse effects on human health, as a result of the removal of asbestos and the heavy metal contaminated soils identified at the site, will be effectively mitigated.

It is therefore considered that this RAP & AEE meets the requirements of the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES).

Due to the concentration of asbestos fibres identified in the site soils and the presence of visual evidence of asbestos, in accordance with the New Zealand Guidelines for Assessing and Manging Asbestos in Soil (BRANZ Limited, 2017), the soils within Remediation Areas 2 & 4 will require removal by a Class B licensed asbestos removalist.

In order to meet the requirements of the Health and Safety at Work (Asbestos) Regulations (MBIE, 2016), it is recommended that the selected contractor incorporates the procedures set out in this RAP & AEE into site-specific asbestos removal control plan and that the works are carried out in accordance with the Approved Code of Practice for the Management, Removal of Asbestos (WorkSafe New Zealand, 2016).

Following the removal of any asbestos contaminated soils or ACM, a certificate of clearance is to be produced by a suitably licensed asbestos assessor.

Should any ACM be discovered during any future works, its removal from the site shall be conducted in accordance with the Health and Safety at Work (Asbestos) Regulations (MBIE, 2016) and the Approved Code of Practice for the Management and Removal of Asbestos (WorkSafe New Zealand, 2016).

22.1 Remediation Criteria

The objectives for the remediation of the site are to remediate the affected soils to levels below the applicable guideline values (as specified in Table 7) to address the immediate human health and environmental concerns at the site. Remediation of the site in the areas shown in Figures 5 & 5-1 will be necessary to achieve compliance with the above guidelines.

The remediation strategy for the site will involve the machine excavation and loading of the affected site soils prior to transport and disposal. The site will then be subject to a process of validation whereby the remaining soils will be sampled to confirm that the objectives of the remediation for the site have been achieved.

The remediation criteria for the site are presented in Tables 17 - 21 below.

Table 17: Remediation criteria for Area 1 & Area 6: 279 Airfield Road, Ardmore (mg/kg).

Parameter	Value
Arsenic	20
Cadmium	3
Lead	210
Zinc	400

Table 18: Remediation criteria for Area 2: 279 Airfield Road, Ardmore (%w/w).

Parameter	Value
Asbestos	0.001%[1]/0.01%[2]
	No visible evidence of asbestos on surface soil[3]

Note: 1 = Soil guideline values for asbestos in Soil of 0.001% combined fibrous asbestos and asbestos fines (FA/AF), taken from the New Zealand Guidelines for Assessing and Managing Asbestos in Soil (BRANZ Limited, 2017); 2 = Soil guideline values for asbestos in Soil of 0.01% asbestos containing material (ACM), taken from the New Zealand Guidelines for Assessing and Managing Asbestos in Soil (BRANZ Limited, 2017); 3 = No visual Evidence of asbestos containing material in the upper 0.1m of soil in accordance with New Zealand Guidelines for Assessing and Managing Asbestos in Soil (BRANZ Limited, 2017).

Table 19: Remediation criteria for Area 3: 279 Airfield Road, Ardmore (mg/kg).

Parameter	Value
Arsenic	20

Table 20: Remediation criteria for Area 4: 279 Airfield Road, Ardmore (%w/w).

Parameter	Value
Asbestos	No visible evidence of asbestos on surface soil[1]

Note: 1 = No visual Evidence of asbestos containing material in the upper 0.1m of soil in accordance with New Zealand Guidelines for Assessing and Managing Asbestos in Soil (BRANZ Limited, 2017).

Table 21: Remediation criteria for Area 5 & Area 7: 279 Airfield Road, Ardmore (mg/kg).

Parameter	Value
Lead	210

As stated above, the remediation of the asbestos contaminated soils in Areas 2 & 4 are to be undertaken under the supervision of a Class B licensed asbestos removalist. It is recommended that a licensed asbestos removalist is present for the duration of the removal works to ensure that the procedures outlined in this plan and the ARCP are adhered to in order to mitigate the potential effects on human health.

Following the removal of any visual evidence of asbestos containing material (Area 2 & 4), a third-party clearance certificate will be obtained by a licensed asbestos assessor.

22.2 Work Programme

It is considered that the health & safety and environmental controls, as detailed below, will be sufficient to ensure that any adverse human health and/or environmental effects, as a result of the contaminated soils identified at the site, will be effectively mitigated.

A contractor experienced in remediation of contaminated sites will undertake the earthworks, excavation & disposal of contaminated soils at the site. The contractor will:

- Prior to works occurring, install a 3.0m fenced buffer surrounding each inferred area of contamination.
- Prepare a site-specific Asbestos Removal Control Plan and notify WorkSafe of the remediation of the asbestos contaminated soils.
- Provide adequate Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE) to all staff involved in the removal works.
- Install facilities on site which include a clean area for staff, a decontamination unit and washing facilities.
- Connect a water source and/or misting system to control any dusts that may be generated as a result of the works. This misting system must be capable of reaching all areas of the site during the ground-breaking works.
- It is recommended that the client engages a third-party asbestos assessor to complete representative asbestos fibre monitoring during the remedial works in Area 2.
- Install sediment and erosion controls for the development works in accordance with industry best practice (Auckland Council's Erosion and Sediment Control Guide for Land Disturbing Activities [3].
- Ensure that the soils within Area 2 are sufficiently wet prior to starting works.
- Machine excavate the contaminated soils from the site and load the materials onto waiting trucks.
- Asbestos contaminated soils will be loaded into trucks lined with 200µm heavy-gauge polythene and wrapped.
- Ensure that the trucks leaving the site have their contents wrapped, are fitted with close fitting tarpaulins and have sealed tailgates.
- Once the trucks have been inspected to ensure that the tarpaulins are properly fitted and the tires are free from any soil materials, transport contaminated soils to a suitable disposal location and retain any weighbridge dockets obtained.
- Obtain certificate of clearance by a suitably licensed asbestos assessor or a competent person for the areas of asbestos contamination (Areas 2 & 4).
- Carry out the validation process and undertake any further remedial works required to achieve the remediation goals.
- Prior to plant being removed from the asbestos removal area, a visual assessment for the presence of asbestos, visible debris and soil shall be carried out by a qualified asbestos assessor and a clearance certificate issued.

[3] Auckland Council, Erosion & Sediment Control Guide for Land Disturbing Activities in the Auckland Region, June 2016, Guideline Document 2016/005.

- Once all contaminated soil has been removed, clearance certificate obtained and the remediation goals achieved then the site will be reinstated with clean fill materials if required and the site stabilized.

22.3 Establishment and Site Preparation

Prior to works commencing the contractor should be familiar with this remediation action plan (RAP) which outlines all environmental and health & safety controls to be implemented when dealing with the contaminated soils.

No unauthorised access to the remedial area will be allowed during the removal of the contaminated soils. Access to the site and the contaminated materials will be restricted during the project.

In addition, the asbestos contaminated area of the site will be fenced off to enclose the work areas. No unauthorised access to the asbestos works areas (Areas 2 & 4), will be allowed during the entirety of the works. Access to the site and the contaminated materials will be restricted during the project.

Appropriate warning signage shall be posted in visible locations during the works and surrounding the stockpile material. All visitors and contractors will sign in and out of the site each day during the removal of the asbestos containing soils.

22.4 Asbestos Fibre Monitoring

In order to confirm that the mitigation controls are sufficient in the areas of asbestos remediation (Area 2) asbestos fibre monitoring is required to confirm that asbestos in air is below trace level (0.01 f/ml).

It is recommended that the client engages a third-party asbestos assessor to complete representative asbestos fibre monitoring during the remedial works in Area 2.

In the event that trace levels are exceeded, cease works, dampen, cover and fence off (barrier tape) the area of works and contact the Contaminated Land Specialist.

22.5 Excavation, Haulage and Disposal of Materials

Excavation works will not commence at the site until all the environmental controls have been put in place. The exposed excavated areas will be kept to a minimum to minimise the risk of erosion due to storm water runoff. Where possible, the excavated materials will be loaded directly onto the removal trucks.

All trucks carting asbestos contaminated soils should be lined with 200µm heavy-gauge polythene. All trucks with asbestos contaminated soils (Area 2) will have their contents wrapped.

All trucks will be fitted with close fitting tarpaulins and have sealed tailgates. All trucks will be inspected prior to leaving the loading area, to ensure that no loose contaminated materials leave the site. During loading wheel covers will be used where possible and any loose materials will be collected for later disposal.

In addition, due to the low-level contamination identified in the areas of Management Areas 1-5, these site soils are not suitable for classification as cleanfill and any topsoil removed from these areas of the site will require disposed at a suitably licensed managed fill facility.

All materials leaving the site will be disposed of to a suitably licensed disposal facility and will be tracked by way of weighbridge dockets which include the disposal location and the weight of the load.

22.6 Validation Sampling

Following the excavation of the asbestos contaminated soils (Area 2) and the visual evidence of asbestos observed (Areas 2 & 4) a clearance certificate will be produced by a suitably licensed asbestos assessor or a competent person. Following receipt of the clearance certificate for Area 2, the base and side walls of the excavated area will be sampled by a suitably qualified and experienced practitioner and the soils analysed by an accredited laboratory to determine if the remediation works have been successful.

In addition, following the excavation of the heavy metal contaminated materials, the soils from the base and walls of the excavated areas will be sampled and the soils analysed by an accredited laboratory to determine if the remediation works have been successful. The results of all validation sampling and clearance certificates will be included in the site validation report.

Site validation sampling will be completed at a frequency sufficient to meet the requirements of the Contaminated Land Management Guidelines No. 5 (MfE, Revised 2021) by a suitably qualified and experienced contaminated land professional.

The clearance certificate/s and the results of all validation sampling will be included in the site validation report.

22.7 Clean Fill Validation (if required)

Any materials imported onto the site if required to reinstate the ground will have to be tested to ensure their suitability as clean fill materials. Any soil material imported to the site shall comply with the definition of 'cleanfill material', as per the Auckland Unitary Plan: Operative in Part.

All imported materials shall be sourced from a site which has been determined by a Suitably Qualified Contaminated Land Professional to have had no known history of potentially contaminating activities, as detailed on the Ministry for the Environment's Hazardous Activities and Industries List (HAIL); or adequately investigated by a

Suitably Qualified Contaminated Land Professional, in accordance with Contaminated Land Management Guidelines (Ministry for the Environment, 2011) to meet the 'Cleanfill material' definition as prescribed in the AUP: OP.

23.0 Assessment of Environmental Effects

The following sections deal with the potential adverse effects which could have a negative impact on the environment and or human health as a result of the remediation project. If the controls outlined in this RAP are implemented during the development works the effects on the environment are likely to be effectively mitigated.

The required site management controls are detailed below and include, but should not be limited to, the following: dust control, health and safety measures, stormwater, erosion and sediment control, odour control and contingency measures.

23.1 Dust Control

During the disturbance process, the area of asbestos contamination (Area 2) should be adequately wet. Soil should have water applied at the point of contact. The excavator or other excavation equipment should handle the material wet.

A continuous water supply should be available at all times. The water source and/or misting system should be capable of applying water or a water mist directly to the materials to minimize dust and prevent fibre emissions. This misting system must be capable of reaching all areas of the remediation area during the ground-breaking works.

For areas of chemical contamination, if conditions are dry during the remedial works dust deposition could occur. Dust will be controlled in accordance with the Good Practice Guidelines for Assessing and Managing the Environmental Effects of Dust Emissions, Ministry for the Environment (2016). In order to mitigate against the effects of dust regular damping down of soil with a misting system will be required.

23.2 Health and Safety Measures

The level of asbestos specific PPE and RPE shall be determined by the asbestos removalist, however, in order to minimise the potential effects or the likelihood of cumulative effects, all personnel likely to come into contact with asbestos contaminated soils and asbestos containing materials (Areas 2 & 4) shall be provided with and wear the following PPE at all times when working in the asbestos contaminated areas of the site:

- Disposable coveralls (Type 5);
- Half-face P3 respirator with particulate filter;
- Steel toe capped gumboots or safety footwear with disposable overshoes;
- Nitrile gloves (if handling any contaminated soils is required);
- Hard Hat (if working around plant and excavators);
- Hearing protection (if required);
- Safety Glasses (to be worn in particularly dry weather conditions); and
- Safety Visibility Vest

All meal breaks are to be taken in designated clean areas following appropriate decontamination.

For the areas of chemical contamination, the level of soil contamination is unlikely to present a short-term risk to site workers. However, in order to minimise the potential effects or the likelihood of cumulative effects, all personnel likely to come into contact with contaminated soils during development works shall be provided with and wear the following PPE at all times when working on the site:

- Tyvek overalls (to be changed immediately if these become highly soiled);
- Dust masks (to be worn in particularly dry weather conditions);
- Approved safety footwear (rubber boots, work boots with toe protection);
- Gloves (if handling any contaminated soils is required);
- Hard Hat (if working around plant and excavators);
- Hearing protection (if required);
- Safety Glasses (to be worn in particularly dry weather conditions); and
- Safety Visibility Vest

All meal breaks are to be taken in designated clean areas or off site, with all personnel washing their hands and mouth area prior to eating, drinking or smoking. Used PPE is to be doffed by all personnel before leaving the site.

23.3 Stormwater, Erosion & Sediment Control

When carrying out any earthworks where soils are disturbed there is a risk of erosion and pollution by sediment being emitted to the receiving water courses. This type of pollution can have a negative effect on the water quality and the ecosystems effecting both plant and fish life.

Install sediment and erosion controls for the development works in accordance with the Auckland Council's Erosion and Sediment Control Guide for Land Disturbing Activities [4].

Earthworks are not to be carried out during periods of significant rainfall. Excavation will be carried out a rate that matches the rate at which soil can be carted off the site. Any contaminated water generated by rainfall impacting on contaminated soils will be retained within the excavation.

It is not anticipated that stockpiling of soils will be required. If required, soil stockpiles will be covered by tarpaulins if left overnight, and when rain is anticipated during the working day. Tarpaulins will be anchored at the edges. As a general management strategy, the size of stockpiles will be kept to a minimum by ensuring that as far as possible, excavation is carried out a rate that matches the rate at which soil is carted off the site.

[4] Auckland Council, Erosion & Sediment Control Guide for Land Disturbing Activities in the Auckland Region, June 2016, Guideline Document 2016/005.

23.4 Odour Control

It is considered unlikely that nuisance odour will be an issue on site. However, in the event that there may be odorous materials encountered, where possible these will be loaded as soon as possible onto the removal trucks. If this is not possible the odorous material will be covered with non-odorous material prior to being loaded.

23.5 Contingency Measures

The following contingency measures have been developed to support the contractor should the underlying contamination conditions vary significantly from the conditions outlined following the site investigation.

If any unexpected materials are identified during the excavation process, which differ from previous observations, and the site soil assessment (i.e., odorous, unusually coloured), the contractor shall immediately contact the environmental specialist to inspect the material and provide advice for the safe handling and disposal of the material.

Visual and olfactory indicators of contamination include the following:

- Asbestos containing materials (ACM) (board, pipe, free fibres or fragments)
- Demolition debris (polystyrene, steel and timber)
- Refuse materials (other than concrete or brick)
- Odour (petroleum, oil, creosote, solvent, sulphur, landfill gas)
- Discoloured soil (black/green staining is most common)
- Incinerator ash (black coarse sand)
- Gasworks wastes (clinker – black gravel, blue billy, black tar)
- Harmful non Cleanfill materials

If any potential ACM or unexpected materials are identified during site works, the area shall immediately be fenced off (barrier tape) with a 2.0m buffer zone, photographs taken and the Contaminated Land Specialist contacted. The Contaminated Land Specialist will then inspect the material and provide advice for the sampling and analysis, safe handling and disposal of the material.

Following the discovery of any unexpected materials, an environmental investigation is to be carried out in general accordance with the Contaminated Land Management Guidelines No. 1 and No. 5 (MfE, Revised 2021).

In the event that soils are found to contain concentrations of contaminants elevated above the relevant site acceptance criteria, the site soils will require remediation and subsequent validation.

All contaminated materials removed from site will require disposal at a suitably licensed disposal facility and site validation sampling is to be completed at a frequency sufficient to meet the requirements of the Contaminated Land Management Guidelines No.5 (MfE, Revised 2021).

In the event that ACMs are identified at the site, its removal from the site shall be conducted in accordance with the Health and Safety at Work (Asbestos) Regulations (MBIE, 2016) and the Approved Code of Practice for the Management and Removal of Asbestos (WorkSafe New Zealand, 2016).

Following the removal of any ACM, a certificate of clearance is to be produced by a suitably licensed asbestos assessor.

If ground water or surface water collects within the excavation during the works, this water shall be allowed to soak into the ground. Any perched groundwater, groundwater, or surface run-off encountered within the excavation area requiring removal shall be considered as potentially contaminated, and shall either be disposed of by a licensed liquid waste contractor, pumped to sewer, provided relevant permits have been obtained, or discharged to the stormwater system or surface waters provided testing demonstrates compliance with the Australian and New Zealand Environment Conservation Council (ANZECC) Guidelines for Fresh and Marine Water Quality (2000) for the protection of 95 percent of species.

In the event that unexpected materials are encountered at the site, Auckland Council are to be notified of the nature and extent of the contamination along and provided with details of the management procedures undertaken at the site.

23.6 Equipment Decontamination & Clearance

Following remediation of the asbestos contaminated soils (Area 2), remove visible debris and soil from all plant, paying attention to the tracks and bucket of excavators.

Prior to plant being removed from the site, a visual assessment for the presence of asbestos, visible debris and soil shall be carried out by an independent assessor or competent person.

Cleaning procedures should be conducted in such a manner as to ensure that all residual soil and contaminants are safely removed and disposed of.

23.7 Site Validation Report

Following the proposed works, it is recommended that a site validation report is prepared. The site validation report should contain sufficient detail to address the following matters:

- A summary of the works undertaken including volume of soil removed from site;
- A summary of the validation testing undertaken, including tabulated analytical results;
- Copies of the disposal dockets for the material removed from the site;
- A copy of the clearance certificate/s for the asbestos contaminated soils and visual evidence of asbestos removed from site;
- Records of any unexpected contamination encountered during the works, if applicable; and
- A summary of any additional soil sampling undertaken, tabulated analytical results, and interpretation of the results in the context of the current contaminated land regulatory requirements.

24.0 Conclusions and Recommendations

This DSI, RAP & AEE has been prepared in accordance with the requirements of the Contaminated Land Management Guidelines No. 1 and No. 5 (Ministry for the Environment, Revised 2021).

It is proposed that the site will be subdivided into residential lots. As part of the redevelopment, the site will undergo a change of land use, subdivision and disturbance of soils, therefore the rules of the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health apply. The guideline values of the Soil Contaminant Standards for health ($SCS_{(health)}$) for residential land use (10% produce consumption) as outlined in the NES are considered relevant. Additionally, in order to accurately perform a risk assessment and to assess whether any discharges from contaminated land will result in significant adverse effects on the environment, the contaminated land rules as outlined in Chapter E30 of the Auckland Unitary Plan: Operative in Part (AUP: OP) also require consideration.

The history of the site was researched by Focus Environmental Services personnel, which involved a review of the available historical aerial photographs of the site, a search of the Auckland Council property file, a contaminated sites enquiry to Auckland Council and a review of the historical certificate of tile.

During the review of the available information, it was noted that due to the age of the current and former site buildings there was potential for ground contamination from the historic use of lead-based paints and potentially asbestos containing building materials. In addition, historical horticulture land use was noted on neighbouring properties, therefore contamination associated with spray-drift may have occurred at the site.

The site was visited and a site inspection and walk over was carried out by Focus Environmental Services Limited personnel on 15th of August 2022. During the site inspection, potential spray race operations, two areas of refuse burning and three areas of potential asbestos containing materials in a degraded condition were noted.

Due to the potential sources of contamination identified it is considered that there is evidence to suggest that an activity outlined in the Hazardous Activities Industries List (HAIL) has been, or is more likely than not to have been undertaken at the site.

Following the site inspection and walkover, the intrusive investigation was carried out by Focus Environmental Services Limited personnel where a total of twenty-one discrete surface soil samples were taken from the potential sources of contamination identified. In addition, twelve samples were taken from the areas of horticultural activity and composited at the laboratory to form three composite samples (4:1). Furthermore, three bulk asbestos samples were collected from areas of potentially asbestos containing materials observed in a degraded condition.

The samples were analysed for contaminants that could be present due to the potentially hazardous activities carried out at the site. The results of the site investigation have indicated that the activities carried out at the site have impacted the site soils.

Elevated concentrations of arsenic, cadmium, lead and zinc were detected in the site soils in the locations of the two burn piles. In addition, elevated concentrations of arsenic were detected in the spray race/stock loading area (2). Elevated concentrations of lead were detected in the areas around the stables (2), HB05 and the dwelling (1). Furthermore, elevated concentrations of asbestos fibres and visual evidence of asbestos were identified in the area of the outdoor toilet, and visual evidence of asbestos was observed in contact with the soils on the northern side of the stables (2).

Concentrations of arsenic, cadmium, lead and zinc were detected in the site soils in two locations at levels elevated above the $SCSs_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES and/or the discharge criteria as outlined in the AUP: OP.

Concentrations of arsenic were detected in another location at levels elevated above the $SCSs_{(health)}$ for residential land use as outlined in the NES.

In addition, concentrations of lead were detected in the site soils in two areas at levels elevated above the $SCSs_{(health)}$ for residential land use (10% produce consumption) as outlined in the NES and/or the discharge criteria as outlined in the AUP: OP.

Furthermore, visual evidence of asbestos containing material was observed in contact with the site soils in two locations, and concentrations of asbestos fibres was detected in one of these areas at levels above the adopted human health criteria.

Due to the elevated levels of arsenic, cadmium, lead, zinc and asbestos fibres detected, the site at 279 Airfield Road, Ardmore will require remediation of the affected soils prior to being redeveloped. The estimated volume of soil requiring remediation is 58.4m^3. It should be noted that this volume may change during the remedial process.

A restricted discretionary consent is required under Regulation 10 of the NES as the proposed subdivision, change of use and disturbance of soils do not meet the requirements of a permitted activity under Regulation 8 of the NES, and as this detailed site investigation for the piece of land has shown that the soil contamination does exceed the applicable standard for residential land use.

Due to the estimated volume of material containing concentrations of contaminants elevated above those values specified in Table E30.6.1.4.1 of Chapter E30 of the AUP: OP being 35.94m^3, which is below 200 m^3, it is considered that the proposed remediation will likely meet the permitted activity requirements under rule E30.6.1.2 of the AUP: OP and therefore resource consent under the AUP: OP may not be required.

In addition, due to low-level concentrations of lead and residual concentrations of organochlorine pesticides detected above natural background concentrations in localised areas of the site, the soils in these areas will require management during development works, and if removed from site, will require disposal to a suitably licensed managed fill facility.

The objective of this Remediation Action Plan is to ensure that the soils contaminated above the adopted site assessment criteria and the materials contaminated above natural background concentrations in the management areas of the site, are handled, removed, or managed in a controlled manner, and disposed of to a suitable disposal location. All earthworks required as part of the remedial works should be carried out in accordance with this Remediation Action Plan.

An assessment of the effects which may occur as a result of the proposed works has been made in order to mitigate any potential adverse environmental and/or human health effects. If the controls outlined in this Remediation Action Plan are implemented during the development works it is considered that the effects on the environment and human health are likely to be effectively mitigated.

Figures

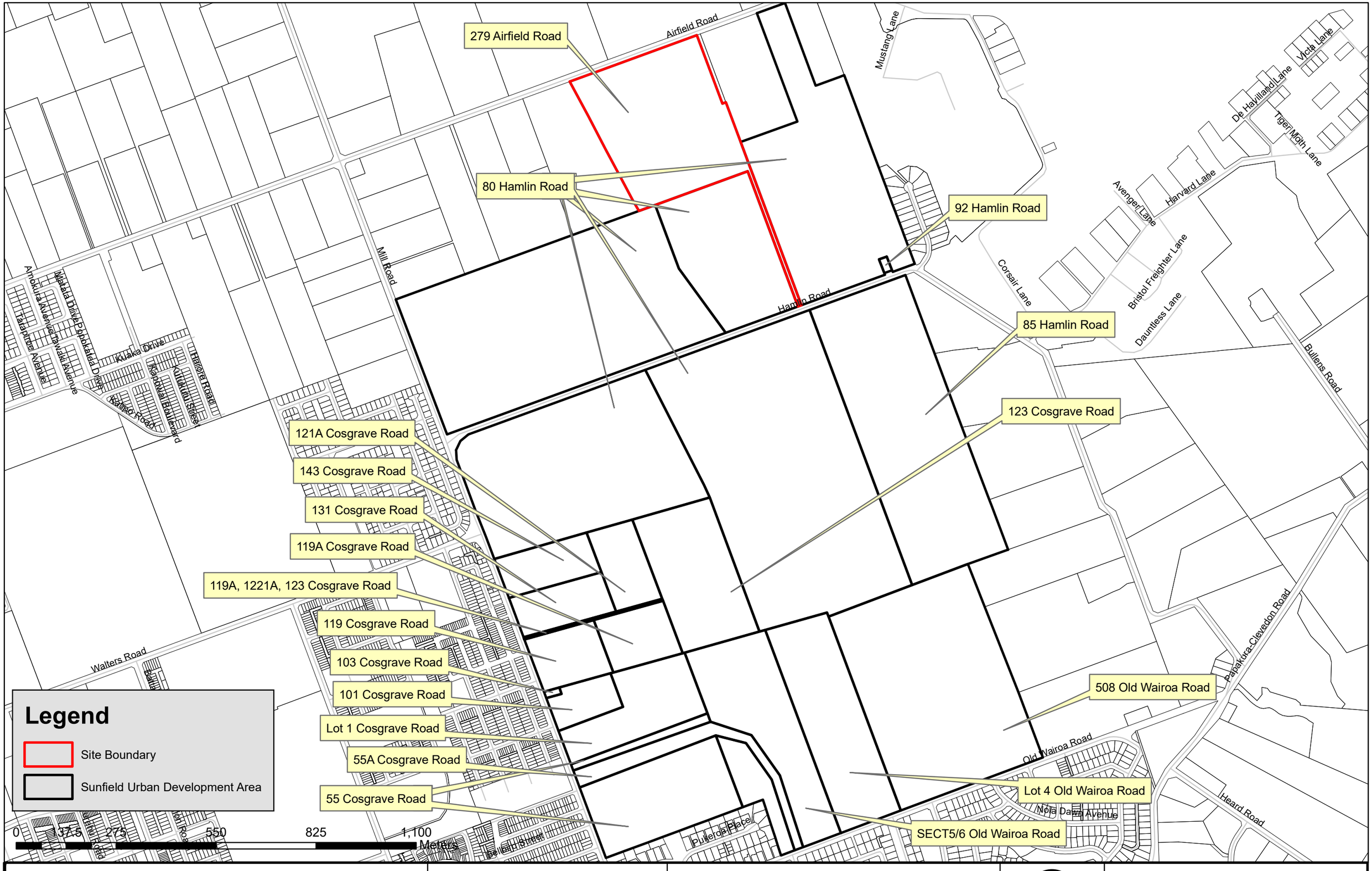


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Figure 1: Site Location Plan
DSI, RAP & AEE

1686.001 (R1)

Drawing Number: 1686.001.01
Drawn By: MT
Checked By: DO'R
Date: 20/12/2023

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Figure 2: Site Features Overview & Historical Building Plan

DSI RAP & AEE

1686.001 (R1)

Drawing Number: 1686.001.02
Drawn By: MT
Checked By: DO'R
Date: 20/12/2023

Site Feature	Description
1	Site Entrance via Gravel Driveway
2	Excavated Pit with Concrete & Minor PACM Fragments
3	Corrugated Painted Metal Hay Shed (1)
4	Carport & Shed 2 - Painted Corrugated Metal Storage of Hay & Farm Equipment
5	Livestock Loading Area - Concrete Lined
6	Shed 3 - Livestock Shed - Unpainted Cinderblock, Concrete Lined.
7	Toilet - Unpainted Plywood & PACM Cladding with Minor Damage
8	Livestock Loading Area
9	Burning of Refuse

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Figure 2-1: Site Features Plan

DSI RAP & AEE

1686.001 (R1)

Drawing Number: 1686.001.02-1
Drawn By: MT
Checked By: DO'R
Date: 20/12/2023

Site Feature	Description
10	Stables (1) - Unpainted Corrugated Metal, Concrete Lined
11	Stables (2) - Painted PACM & Metal Cladding
12	Horse Arena
13	Garage (1) - Painted Corrugated Metal, Concrete Lined
14	Dwelling (1) - Raised Single Storey, PACM Baseboards & Soffits, Wooden Cladding
15	Shipping Container
16	Burn Barrell
17	Garage (2) - Painted Metal Cladding
18	Dwelling (2) - Raised Single Storey, PACM baseboards, Painted Metal Cladding
19	Septic Tank Vent

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Figure 2-2: Site Features Plan

DSI RAP & AEE

1686.001 (R1)

Drawing Number: 1686.001.02-2
Drawn By: MT
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Date: 20/12/2023

FOCUS ENVIRONMENTAL SERVICES LTD	Focus Environmental Services Limited PO Box 11455 Ellerslie Auckland 1542 Ph: +64 9 579 4155 www.focusenvironmental.co.nz	**Winton Land Limited** 279 Airfield Road Sunfield Urban Development Area Papakura Auckland	**Figure 3: Surrounding Environment** DSI RAP & AEE	N 1686.001 (R1)	Drawing Number: 1686.001.03 Drawn By: MT Checked By: DO'R Date: 20/12/2023

Focus Environmental Services Limited PO Box 11455 Ellerslie Auckland 1542 Ph: +64 9 579 4155 www.focusenvironmental.co.nz	**Winton Land Limited** 279 Airfield Road Sunfield Urban Development Area Papakura Auckland	**Figure 4: Sample Location Plan Overview** DSI RAP & AEE	N	Drawing Number: 1686.001.04 Drawn By: MT Checked By: DO'R Date: 20/12/2023
			1686.001 (R1)	

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Figure 4-1: Discrete Sample Location Plan

DSI RAP & AEE

1686.001 (R1)

Drawing Number: 1686.001.04-1
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Checked By: DO'R
Date: 20/12/2023

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Figure 4-2: Discrete Sample Location Plan

DSI RAP & AEE

	Drawing Number: 1686.001.04-2
	Drawn By: MT
1686.001 (R1)	Checked By: DO'R
	Date: 20/12/2023

Focus Environmental Services Limited
PO Box 11455
Ellerslie
Auckland 1542

Ph: +64 9 579 4155
www.focusenvironmental.co.nz

Winton Land Limited
279 Airfield Road
Sunfield Urban Development Area
Papakura
Auckland

Figure 4-3: Composite Sample Location Plan

DSI RAP & AEE

1686.001 (R1)

Drawing Number: 1686.001.04-3
Drawn By: MT
Checked By: DO'R
Date: 20/12/2023

Location	Area (m^2)	Depth (m)	Contaminant	Quantity (m^3)
Area 1	19	0.3	As, Cd, Pb, Zn	5.7
Area 2	8.4	0.3	Asbestos	2.52
Area 3	11.5	0.3	As	3.45
Total Volume				11.67
Total Tonnes (m^3 x 1.5)				**17.5 t**

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Sunfield Developments Limited

279 Airfield Road
Sunfield Urban Development Area
Papakura
Auckland

Figure 5: Inferred Area and Depth of Contamination

DSI RAP & AEE

	Drawing Number: 1686.001.05
	Drawn By: MT
1686.001 (R1)	Checked By: DO'R
	Date: 20/12/2023

Location	Area (m^2)	Depth (m)	Contaminant	Quantity (m^3)
Area 4	10.8	-	Visual ACM	-
Area 5	54.9	0.3	Pb	16.47
Area 6	3.1	0.3	As, Cd, Pb, Zn	0.93
Area 7	97.7	0.3	Pb	29.31
Total Volume				46.71
Total Tonnes (m^3 x 1.5)				**70.1 t**

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Auckland

Figure 5-1: Inferred Area and Depth of Contamination

DSI RAP & AEE

	Drawing Number: 1686.001.05-1
	Drawn By: MT
1686.001 (R1)	Checked By: DO'R
	Date: 20/12/2023

Location	Area (m^2)	Depth (m)	Contaminant	Quantity (m^3)
Management Area 1	17.2	0.3	Pb	5.16
Management Area 2	5,284.2	0.3	OCP's	1585.26
Total Volume				1,590.42
Total Tonnes (m^3 x 1.5)				**2,385.6 t**

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Winton Land Limited

279 Airfield Road
Sunfield Urban Development Area
Papakura
Auckland

Figure 6: Inferred Areas Requiring Management

DSI RAP & AEE

1686.001 (R1)

Drawing Number: 1686.001.06

Drawn By: MT

Checked By: DO'R

Date: 20/12/2023

Location	Area (m^2)	Depth (m)	Contaminant	Quantity (m^3)
Management Area 3	20	0.3	Pb	6
Management Area 4	43.4	0.3	Pb	13.02
Management Area 5	52.15	0.3	Pb	15.645
Total Volume				34.67
Total Tonnes (m^3 x 1.5)				**52.0 t**

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Auckland 1542

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Sunfield Urban Development Area
Papakura
Auckland

Figure 6-1: Inferred Areas Requiring Management

DSI RAP & AEE

1686.001 (R1)

Drawing Number: 1686.001.06-1
Drawn By: MT
Checked By: DO'R
Date: 20/12/2023

Appendices

Appendix A – Illustrative Masterplan

Appendix B – Site Contour Plan

Site Contour Plan

0 20 40 60
Meters

Scale @ A3
= 1:2,500

Date Printed:
2/08/2022

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix C – Environmental HAIL

Ministry for the Environment
Manatū Mō Te Taiao

Hazardous Activities and Industries List (HAIL)

October 2011

A Chemical manufacture, application and bulk storage

1. Agrichemicals including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application
2. Chemical manufacture, formulation or bulk storage
3. Commercial analytical laboratory sites
4. Corrosives including formulation or bulk storage
5. Dry-cleaning plants including dry-cleaning premises or the bulk storage of dry-cleaning solvents
6. Fertiliser manufacture or bulk storage
7. Gasworks including the manufacture of gas from coal or oil feedstocks
8. Livestock dip or spray race operations
9. Paint manufacture or formulation (excluding retail paint stores)
10. Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds
11. Pest control including the premises of commercial pest control operators or any authorities that carry out pest control where bulk storage or preparation of pesticide occurs, including preparation of poisoned baits or filling or washing of tanks for pesticide application
12. Pesticide manufacture (including animal poisons, insecticides, fungicides or herbicides) including the commercial manufacturing, blending, mixing or formulating of pesticides
13. Petroleum or petrochemical industries including a petroleum depot, terminal, blending plant or refinery, or facilities for recovery, reprocessing or recycling petroleum-based materials, or bulk storage of petroleum or petrochemicals above or below ground
14. Pharmaceutical manufacture including the commercial manufacture, blending, mixing or formulation of pharmaceuticals, including animal remedies or the manufacturing of illicit drugs with the potential for environmental discharges
15. Printing including commercial printing using metal type, inks, dyes, or solvents (excluding photocopy shops)
16. Skin or wool processing including a tannery or fellmongery, or any other commercial facility for hide curing, drying, scouring or finishing or storing wool or leather products
17. Storage tanks or drums for fuel, chemicals or liquid waste
18. Wood treatment or preservation including the commercial use of anti-sapstain chemicals during milling, or bulk storage of treated timber outside

B Electrical and electronic works, power generation and transmission

1. Batteries including the commercial assembling, disassembling, manufacturing or recycling of batteries (but excluding retail battery stores)

2. Electrical transformers including the manufacturing, repairing or disposing of electrical transformers or other heavy electrical equipment
3. Electronics including the commercial manufacturing, reconditioning or recycling of computers, televisions and other electronic devices
4. Power stations, substations or switchyards

C Explosives and ordinances production, storage and use

1. Explosive or ordinance production, maintenance, dismantling, disposal, bulk storage or re-packaging
2. Gun clubs or rifle ranges, including clay targets clubs that use lead munitions outdoors
3. Training areas set aside exclusively or primarily for the detonation of explosive ammunition

D Metal extraction, refining and reprocessing, storage and use

1. Abrasive blasting including abrasive blast cleaning (excluding cleaning carried out in fully enclosed booths) or the disposal of abrasive blasting material
2. Foundry operations including the commercial production of metal products by injecting or pouring molten metal into moulds
3. Metal treatment or coating including polishing, anodising, galvanising, pickling, electroplating, or heat treatment or finishing using cyanide compounds
4. Metalliferous ore processing including the chemical or physical extraction of metals, including smelting, refining, fusing or refining metals
5. Engineering workshops with metal fabrication

E Mineral extraction, refining and reprocessing, storage and use

1. Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition
2. Asphalt or bitumen manufacture or bulk storage (excluding single-use sites used by a mobile asphalt plant)
3. Cement or lime manufacture using a kiln including the storage of wastes from the manufacturing process
4. Commercial concrete manufacture or commercial cement storage
5. Coal or coke yards
6. Hydrocarbon exploration or production including well sites or flare pits
7. Mining industries (excluding gravel extraction) including exposure of faces or release of groundwater containing hazardous contaminants, or the storage of hazardous wastes including waste dumps or dam tailings

F Vehicle refuelling, service and repair

1. Airports including fuel storage, workshops, washdown areas, or fire practice areas
2. Brake lining manufacturers, repairers or recyclers
3. Engine reconditioning workshops
4. Motor vehicle workshops
5. Port activities including dry docks or marine vessel maintenance facilities

6. Railway yards including goods-handling yards, workshops, refuelling facilities or maintenance areas
7. Service stations including retail or commercial refuelling facilities
8. Transport depots or yards including areas used for refuelling or the bulk storage of hazardous substances

G Cemeteries and waste recycling, treatment and disposal

1. Cemeteries
2. Drum or tank reconditioning or recycling
3. Landfill sites
4. Scrap yards including automotive dismantling, wrecking or scrap metal yards
5. Waste disposal to land (excluding where biosolids have been used as soil conditioners)
6. Waste recycling or waste or wastewater treatment

H Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment

I Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment

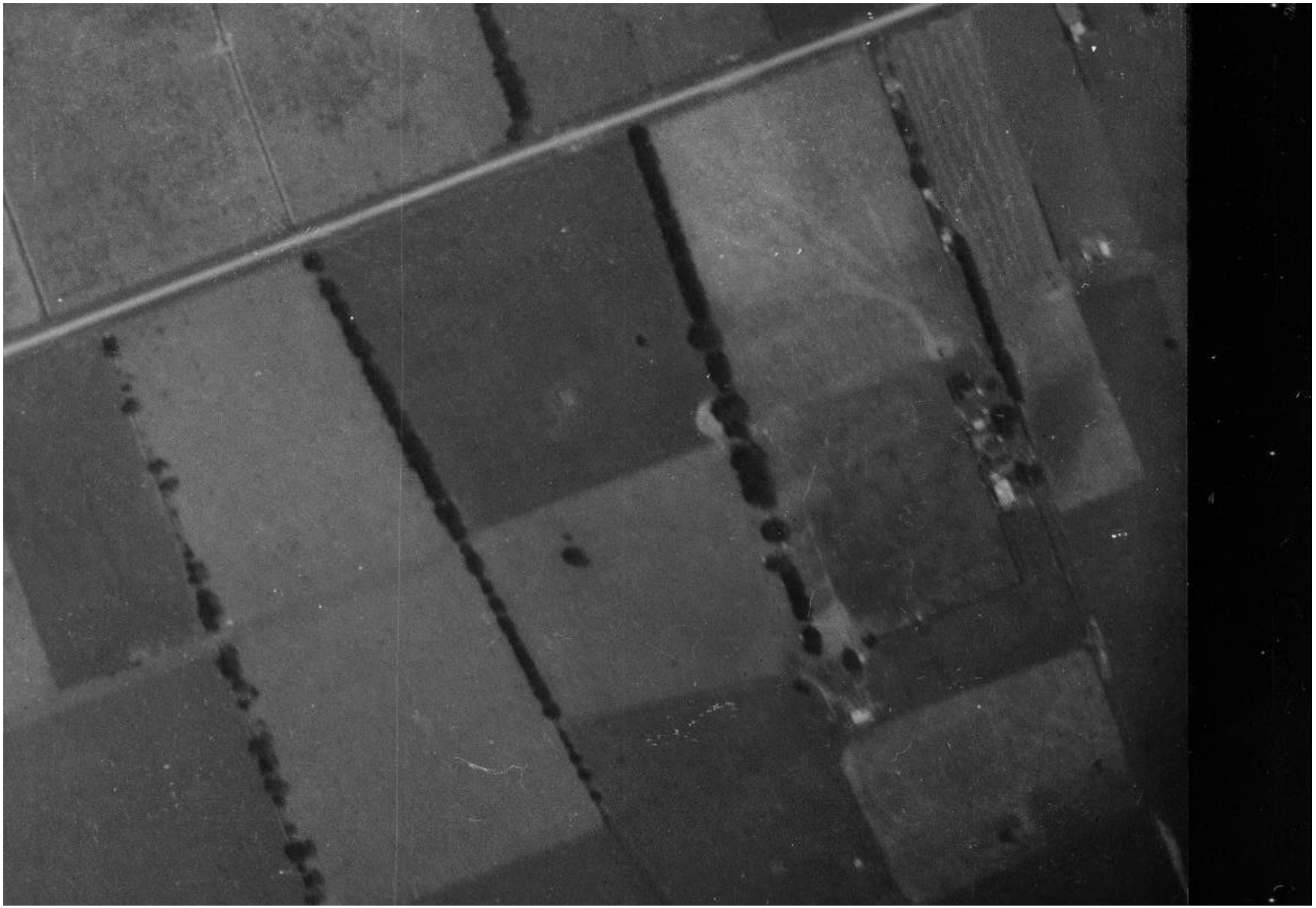
Appendix D – Historical Aerial Photographs

Historical Aerial Photographs

279 Airfield Road
Ardmore

by Focus Environmental Services Limited

1939 Historical Photograph



Source: NZ Aerial Mapping

1959 Historical Photograph

0 30 60 90
Meters

Scale @ A4
= 1:5,000

Date Printed:
4/08/2022

Auckland Council
Te Kaunihera o Tāmaki Makaurau

1960 Historical Photograph

Source: NZ Aerial Mapping

1975 Historical Photograph

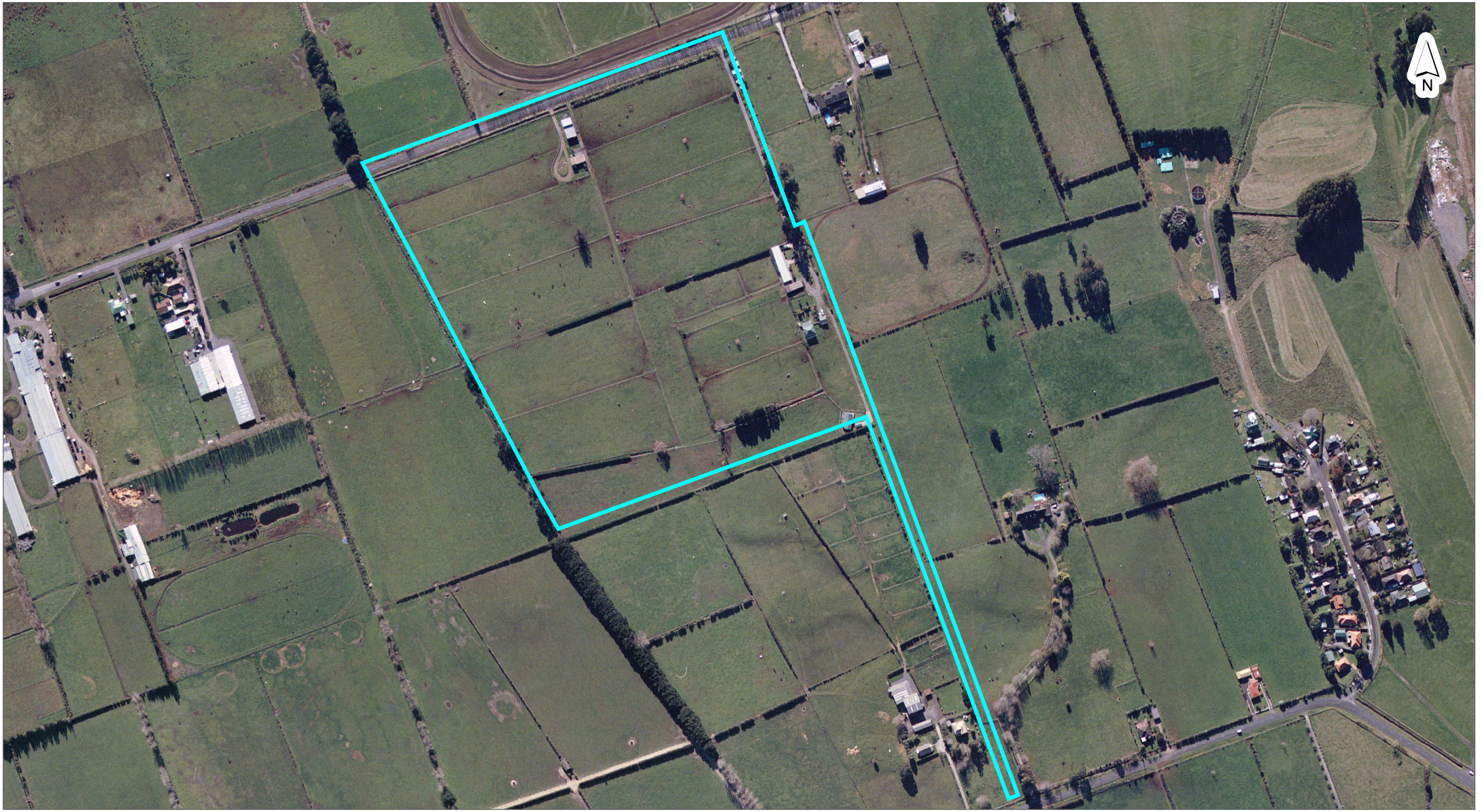
Source: NZ Aerial Mapping

1981 Historical Photograph

Source: NZ Aerial Mapping

1988 Historical Photograph

Source: NZ Aerial Mapping



2001 Historical Photograph

0 30 60 90
Meters

Scale @ A4
= 1:5,000

Date Printed:
4/08/2022

Auckland Council
Te Kaunihera o Tāmaki Makaurau

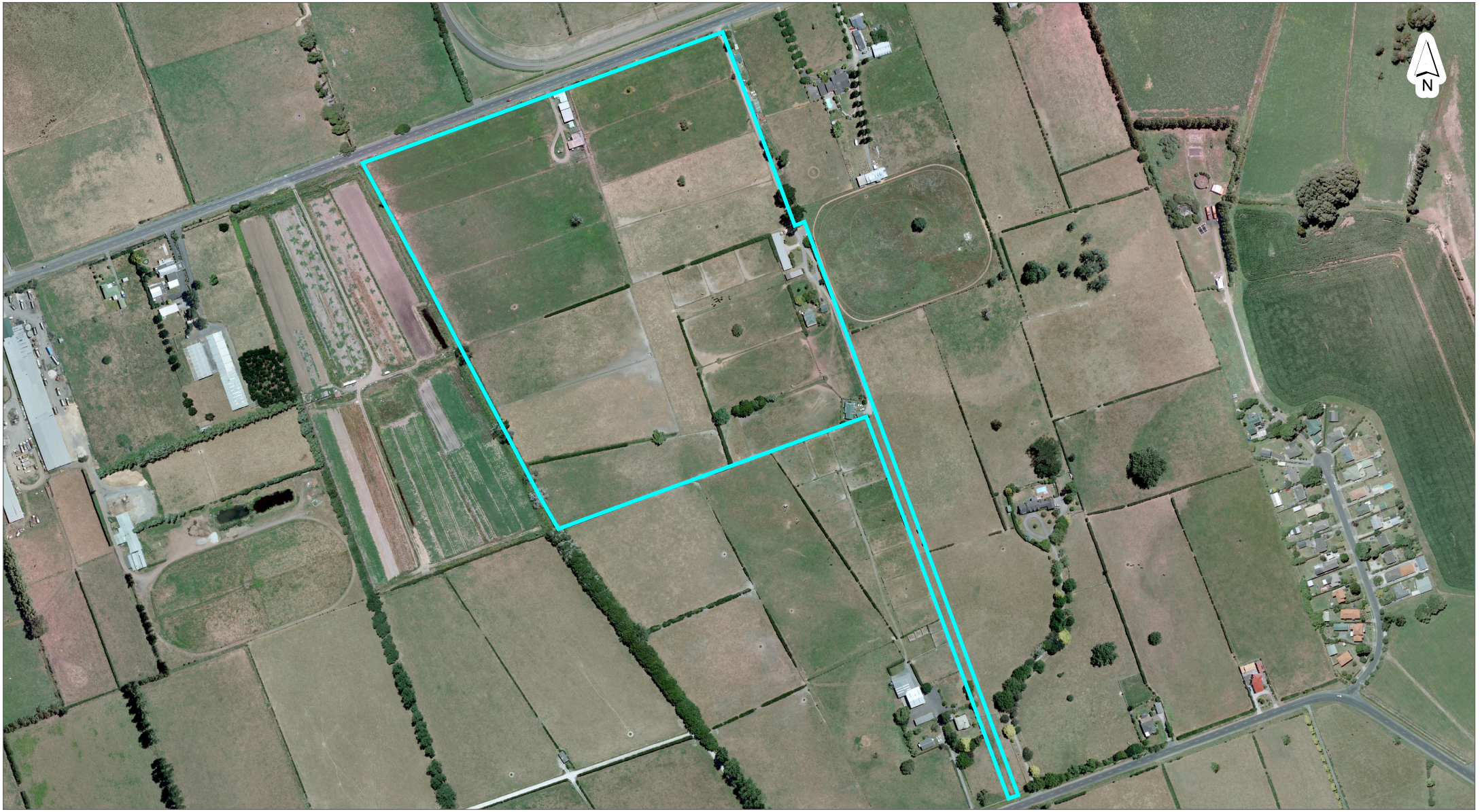
2006 Historical Photograph

0 30 60 90
Meters

Scale @ A4
= 1:5,000

Date Printed:
4/08/2022

Auckland Council
Te Kaunihera o Tāmaki Makaurau



2008 Historical Photograph

0 30 60 90
Meters

Scale @ A4
= 1:5,000

Date Printed:
4/08/2022

Auckland Council
Te Kaunihera o Tāmaki Makaurau

2010 Historical Photograph

0 30 60 90
Meters

Scale @ A4
= 1:5,000

Date Printed:
4/08/2022

Auckland Council
Te Kaunihera o Tāmaki Makaurau

2015 Historical Photograph

0 30 60 90
Meters

Scale @ A4
= 1:5,000

Date Printed:
4/08/2022

Auckland Council
Te Kaunihera o Tāmaki Makaurau

2017 Historical Photograph

0 30 60 90
Meters

Scale @ A4
= 1:5,000

Date Printed:
4/08/2022

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix E – Historical Certificate of Title

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Historical Search Copy

R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **NA128A/553**

Land Registration District **North Auckland**

Date Issued 24 January 2000

Prior References
NA1136/171

Estate Fee Simple

Area 14.4224 hectares more or less

Legal Description Lot 2 Deposited Plan 199521

Original Registered Owners
Airfield Farms Limited

Interests

Subject to a right of way over parts marked M, N and O on DP 199521 created by Conveyance 216692 (R.198/370)

Fencing Agreement in Conveyance 229476 (R.219/434)

Subject to an electric current transmission right (in gross) over parts marked B, C, G, I, J, K and N on DP 199521 in favour of The Auckland Electric Power Board created by Transfer 360785

Subject to an electricity right (in gross) over parts marked A, C, D, H, J and L on DP 199521 in favour of The Auckland Electric Power Board created by Transfer A444444 - 4.2.1970 at 9.00 am

941631.1 Proclamation (NZ Gazette 9 July 1981 No.80 P1899) defining the middle line of Oaonui - Auckland pipeline - 22.1.1981 at 2.33 pm

D472180.2 Consent Notice pursuant to Section 221 (1) Resource Management Act 1991 - 24.1.2000 at 3.01 pm

6397242.1 CAVEAT BY MICHAEL JAMES DRENNAN - 26.4.2005 at 3:49 pm

6420030.1 CAVEAT BY LING ZHANG AND JIONG HAO LIU - 13.5.2005 at 9:00 am

6444378.1 Lapse of Caveat 6397242.1 pursuant to Section 145 Land Transfer Act 1952 - produced 2.6.2005 at 9:00 am and entered 24.6.2005 at 9.01 am

6444378.2 Transfer to Jiong Hao Liu and Ling Ling Zhang - produced 2.6.2005 at 9:00 am and entered 24.6.2005 at 9.01 am

6518773.1 Lapse of Caveat 6420030.1 pursuant to Section 145 Land Transfer Act 1952 - produced 3.8.2005 at 9:00 am and entered 23.8.2005 at 9:01am

6518773.2 Mortgage to ASB Bank Limited - produced 3.8.2005 at 9:00 am and entered 23.8.2005 at 9:01am

6558915.1 Surrender of the right of way created by Conveyance 216692 (R.198/370) - 5.9.2005 at 9:00 am

Subject to a right of way over part marked A on DP 338941 created by Easement Instrument 6558915.2 - 5.9.2005 at 9:00 am

7724579.2 Transmission to Ling Ling Zhang - 22.2.2008 at 9:00 am

8655313.1 Discharge of Mortgage 6518773.2 - 25.2.2011 at 3:54 pm

8655313.2 Transfer to Ling Zhang and Serena Liu - 25.2.2011 at 3:54 pm

10379677.1 Mortgage to Westpac New Zealand Limited - 31.3.2016 at 4:29 pm

11486384.1 Discharge of Mortgage 10379677.1 - 8.7.2019 at 2:28 pm

11486384.2 Mortgage to ANZ Bank New Zealand Limited - 8.7.2019 at 2:28 pm

12519602.1 CAVEAT BY SUNFIELD DEVELOPMENTS LIMITED - 25.7.2022 at 6:44 pm

Reference:
Prior CT: 1136/171
Document No.: D472180.3

LT69

128A/553

REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT 1952

This Certificate dated the 24th day of January Two Thousand under the seal of the Registrar-General of Land, New Zealand, for the Land Registration District of NORTH AUCKLAND

WITNESSETH that **AIRFIELD FARMS LIMITED**

is seised of an estate in **fee simple** (subject to such reservations, restrictions, encumbrances and interests as are notified by memorial endorsed hereon) in the land hereinafter described, delineated on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 14.4224 hectares, more or less being **LOT 2 DEPOSITED PLAN 199521**

REGISTRAR-GENERAL OF LAND NEW ZEALAND

for Registrar-General of Land

Subject to a right of way easement over part herein marked M,N,O DP199521 appurtenant to part Allotment 30 Parish of Papakura CT 1194/99 created by Conveyance 216692 (R.198/370)

Fencing agreement in Conveyance 229476 (R.219/434)

Subject to an electric current transmission easement over part herein marked B,C,G,I,J,K,N DP199521 to The Auckland Electric Power Board created by Transfer 360785

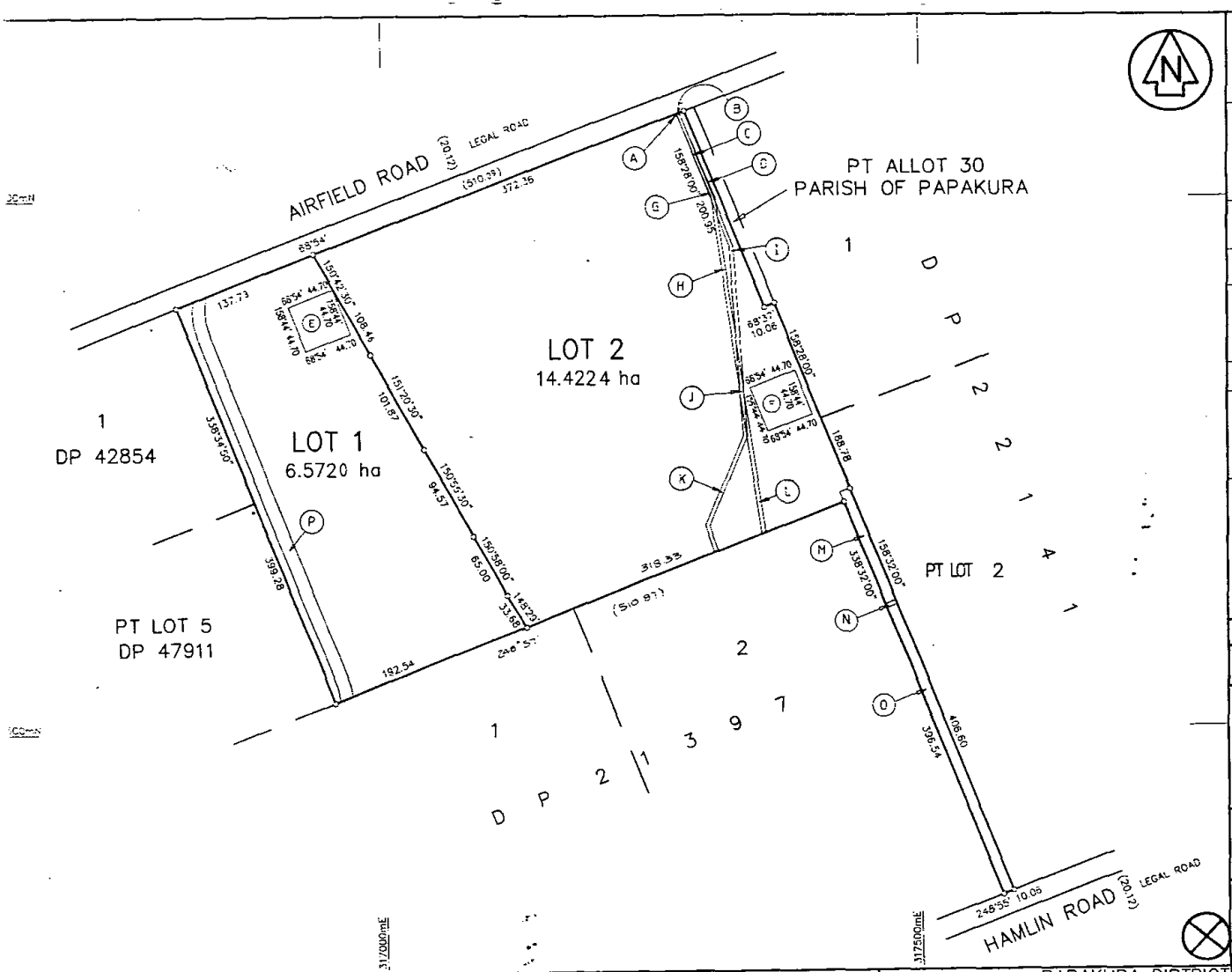
Subject to an electricity easement in gross over the part herein marked A,C,D,H,J,L DP 199521 to The Auckland Electric Power Board created by Transfer A444444-4.2.1970 at 9.00

941631.1 Proclamation (NZ Gazette 9 July 1981 No.80 P 1899) defining the middle line of the Oaonui – Auckland pipeline – 22.1.1981 at 2.33

D472180.2 Consent Notice under Section 221(1) Resource Management Act 1991 by *The Papakura District Council* 24.1.2000 at 3.01

For RGL

128A/553



Approvals

Registered Owners S. Dixon - Witness

I hereby certify that this plan was approved by the Council pursuant to Section 223 of the Resource Management Act, 1991 on the ... day of ... 1999

Principal Administrative Officer / Authorised Officer

EXISTING EASEMENT

PURPOSE	SHOWN	CREATED BY
RIGHT OF WAY	(M)(N)(O)	CONVEYANCE 2°6892 :R198/370

EXISTING EASEMENT IN GROSS

PURPOSE	SHOWN	CREATED BY
PIPELINE	(P)	B 245132-1
ELECTRICITY	(A)(C)(D)(H)(J)(L)	A 444444
	(B)(C)(G)(I)(J)(K)(N)	T. 360785

NOTE
1. AREAS MARKED (E) & (F) ARE SUBJECT TO A LAND COVENANT

New CT Allocated
LOT 1 :22A/552
LOT 2 :22A/553

Class of survey: III

Total Area 20.9944 ha

Comprised in CT 1136/171 (ALL)

I, SHANE DIXON
Registered Surveyor and holder of an annual practising certificate (or who may act as a registered surveyor pursuant to Section 25 of the Survey Act 1986) hereby certify that this plan has been made from surveys executed by me or under my directions, that both plan and survey are correct and have been made in accordance with the Survey Regulations 1998 or any regulations made in substitution thereof.
Dated at AUCKLAND this 11th day of November 1999 Signature

Field Book ... p. ... Traverse Book ... p. ...
Reference Plans DP's 54927,42854,47911,33638,24083,22141, 21397,20982,12252 & SO's 56209,56793 & 48649
Examined ... Correct ...

Approved as to Survey
6/12/99 Chief Surveyor

Deposited this 24th day of January 2000
Registrar-General of Land

DP 199521

Approved AKLM 98/05

LAND DISTRICT NORTH AUCKLAND
SURVEY BLK. & DIST. XV OTAHUHU
SHTS 261 SHT ... RECORD MAP No. ...

PLAN OF LOTS 1 & 2 BEING A SUBDIVISION OF PT LOT 1 & LOT 2 DP 12262 & PT ALLOT 30, PARISH OF PAPAKURA

TERRITORIAL AUTHORITY PAPAKURA DISTRICT
Surveyed by HARRISON GRIERSON CONSULTANTS LTD
Scale 1:2500 Date SEPT. 1999

A.J. BEVAN, SURVEYOR GENERAL, LAND INFORMATION NEW ZEALAND, NEW ZEALAND

Appendix F – Site Contamination Enquiry

15 August 2022

Focus Environmental Services
PO Box 11455
AUCKLAND 1542

Attention: Cari Llewellyn

Dear Cari

Site Contamination Enquiry at *279 Airfield Road, Ardmore*

This letter is in response to your enquiry requesting available site contamination information within Auckland Council records for the above site. Please note this report does not constitute a site investigation report; such reports are required to be prepared by a (third-party) Suitably Qualified and Experienced Practitioner.

The following details are based on information available to the Contamination, Air & Noise Team in the Resource Consent Department. The details provided may be from former regional council information, as well as property information held by the former district/city councils. For completeness the relevant property file should also be requested to obtain all historical records and reports via 09 3010101 or online at:

https://www.aucklandcouncil.govt.nz/buying-property/order-property-report/Pages/order-property-file.aspx.

1. Hazardous Activities and Industries List (HAIL) Information

This list published by the Ministry for the Environment (MfE) comprises activities and industries that are considered likely to cause land contamination as a result of hazardous substance use, storage, and/or disposal.

There is no contamination information within Council records for the site.

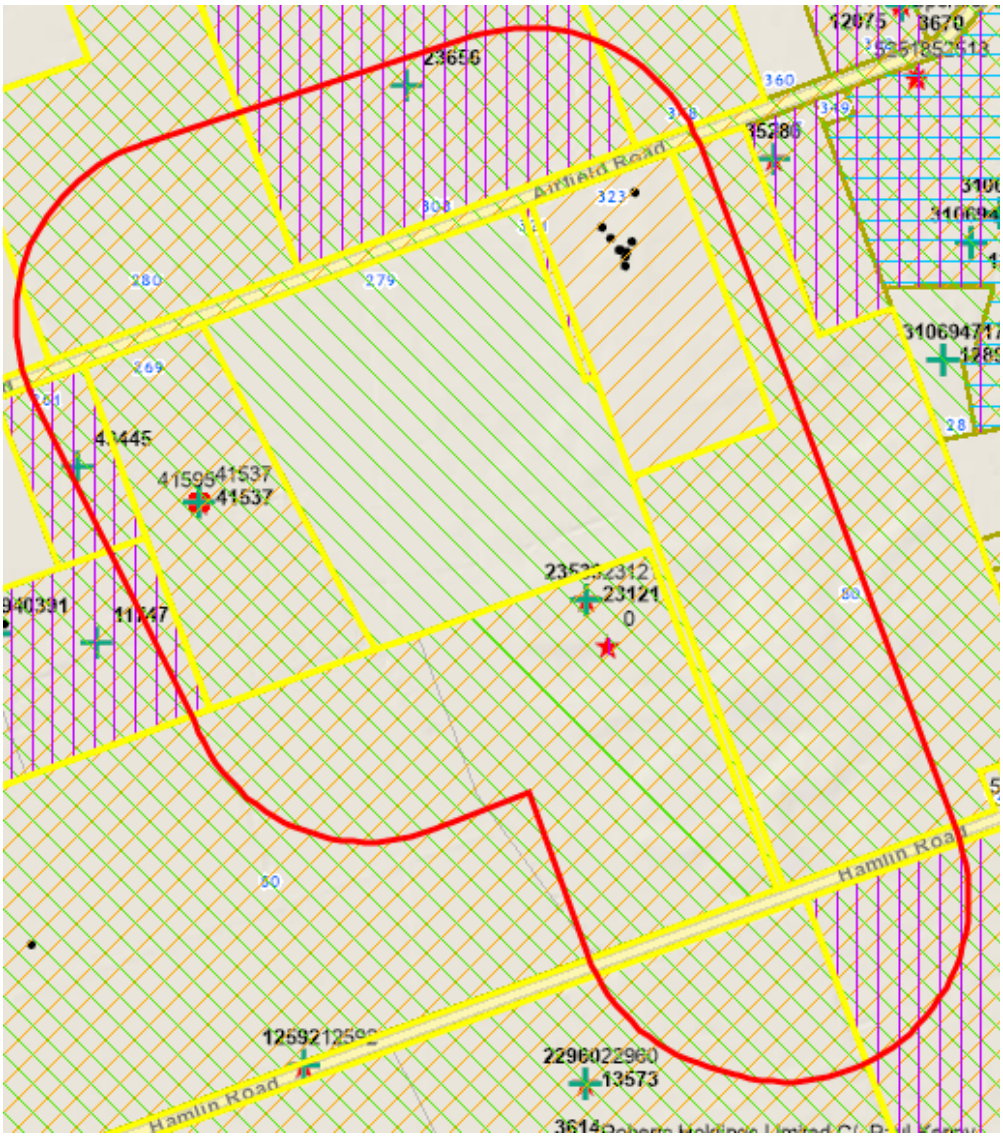
Please note:

- *If you are demolishing any building that may have asbestos containing materials (ACM) in it, you have obligations under the Health and Safety at Work (Asbestos) Regulations 2016 for the management and removal of asbestos, including the need to engage a Competent Asbestos Surveyor to confirm the presence or absence of any ACM.*
- *Paints used on external parts of properties up until the mid-1970's routinely contained lead, a poison and a persistent environmental pollutant. You are advised to ensure that soils affected by old, peeling or flaking paint are assessed in relation to the proposed use of the property, including high risk use by young children.*

2. Consents and Incidents Information (200m radius of the selected site)

The Council database was searched for records of the following activities within approximately 200 metres of the site:

- Pollution Incidents (including air discharges, oil or diesel spills)
- Bores
- Contaminated site and air discharges, and industrial trade process consents
- Closed Landfills
- Air quality permitted activities



Legend:

All Consents

All Applications

All Permitted Activities

All Bores

Closed Landfill (Auckland Council owned)

Closed Landfill (Privately owned)

Relevant details of any pollution incidents and consents are appended to this letter (Attachment A). Please refer to the column titled ‘Property Address’ on the spreadsheet to aid in identifying corresponding data on the map.

While the Auckland Council has carried out the above search using its best practical endeavours, it does not warrant its completeness or accuracy and disclaims any responsibility or liability in respect of the information. If you or any other person wishes to act or to rely on this information, or make any financial commitment based upon it, it is recommended that you seek appropriate technical and/or professional advice.

If you wish to clarify anything in this letter that relates to this site, please contact contaminatedsites@aucklandcouncil.govt.nz. Any follow up requests for information on other sites must go through the online order process.

Should you wish to request any of the files referenced above and/or listed in the attached spreadsheet for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days’ notice to ensure the files will be available).

Please note Auckland Council cost recovers officer’s time for all site enquiries. As such an invoice for $128 for the time involved in this enquiry will follow shortly.

Yours Sincerely,

Contamination, Air and Noise Team
Specialist Unit | Resource Consents
Auckland Council

Appendix G – Site Inspection Photographs

Site Inspection Photographs

279 Airfield Road
Ardmore

by Focus Environmental Services Limited

Site Entrance

Excavated Pit

Corrugated Metal Shed (1)

Corrugated Metal Shed (1) - Eastern Side

Contents of Corrugated Metal Shed (1)

Carport and Shed (2)

Contents of Shed (2)

Livestock Loading Area (1)

Toilet and Livestock Shed

Livestock Shed - Interior

Toilet Interior – PACM Fragments

Livestock Shed - Western Side

Livestock Spray Race/Loading Area (2)

Burn/ Refuse Pit

Stables (1)

Stables (1) Southern End

Stables (2)

Stables (2) Interior

Stables (2) - Minor Damage to PACM Cladding

Horse Arena

Garage (1)

Dwelling (1) Northern Side

Shipping Container

Burn Barrell

Garage (2)

Dwelling (2)

Dwelling (2) South Western Corner

Septic Tank Vent

Appendix H – RPD Calculations

RPD Calculations: 279 Airfield Road, Ardmore, Auckland

Parameter	Pb01	QC01	RPD (%)	Pb10	QC02	RPD (%)
Total Recoverable Lead	95	92	3.21	96	86	10.99

Note: Results in *I talics* exceed 30% RPD. Results in red exceed 50% RPD

Appendix I – Laboratory Transcripts

Hill Laboratories
TRIED, TESTED AND TRUSTED

R J Hill Laboratories Limited
28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand

T 0508 HILL LAB (44 555 22)
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	Focus Environmental Services Limited	**Lab No:**	3056055	SPv1
Contact:	Cari Llewellyn	**Date Received:**	17-Aug-2022	
	C/- Focus Environmental Services Limited	**Date Reported:**	24-Aug-2022	
	PO Box 11455	**Quote No:**	80876	
	Ellerslie	**Order No:**		
	Auckland 1542	**Client Reference:**	1686.001	
		Submitted By:	Megan Thomas	

Sample Type: Soil

Sample Name:		SR01 16-Aug-2022	BP01 16-Aug-2022	BP02 16-Aug-2022	Pb01 16-Aug-2022	Pb02 16-Aug-2022
Lab Number:		3056055.1	3056055.2	3056055.3	3056055.4	3056055.5
Individual Tests						
Dry Matter	g/100g as rcvd	46	52	57	-	-
Total Recoverable Arsenic	mg/kg dry wt	43	-	-	-	-
Total Recoverable Lead	mg/kg dry wt	-	-	-	95	25
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	58	68	-	-
Total Recoverable Cadmium	mg/kg dry wt	-	3.3	3.3	-	-
Total Recoverable Chromium	mg/kg dry wt	-	57	54	-	-
Total Recoverable Copper	mg/kg dry wt	-	83	104	-	-
Total Recoverable Lead	mg/kg dry wt	-	240	1,040	-	-
Total Recoverable Nickel	mg/kg dry wt	-	10	33	-	-
Total Recoverable Zinc	mg/kg dry wt	-	480	840	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.03	-	-	-	-
alpha-BHC	mg/kg dry wt	< 0.03	-	-	-	-
beta-BHC	mg/kg dry wt	< 0.03	-	-	-	-
delta-BHC	mg/kg dry wt	< 0.03	-	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.03	-	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.03	-	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.03	-	-	-	-
2,4'-DDD	mg/kg dry wt	< 0.03	-	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.03	-	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.03	-	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.03	-	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.03	-	-	-	-
4,4'-DDT	mg/kg dry wt	0.02	-	-	-	-
Total DDT Isomers	mg/kg dry wt	< 0.13	-	-	-	-
Dieldrin	mg/kg dry wt	< 0.03	-	-	-	-
Endosulfan I	mg/kg dry wt	< 0.03	-	-	-	-
Endosulfan II	mg/kg dry wt	< 0.03	-	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.03	-	-	-	-
Endrin	mg/kg dry wt	< 0.03	-	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.03	-	-	-	-
Endrin ketone	mg/kg dry wt	< 0.03	-	-	-	-
Heptachlor	mg/kg dry wt	< 0.03	-	-	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.03	-	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.03	-	-	-	-
Methoxychlor	mg/kg dry wt	< 0.03	-	-	-	-

Sample Type: Soil						
Sample Name:		SR01 16-Aug-2022	BP01 16-Aug-2022	BP02 16-Aug-2022	Pb01 16-Aug-2022	Pb02 16-Aug-2022
Lab Number:		3056055.1	3056055.2	3056055.3	3056055.4	3056055.5
Polycyclic Aromatic Hydrocarbons Screening in Soil*						
Total of Reported PAHs in Soil	mg/kg dry wt	-	< 0.5	1.1	-	-
1-Methylnaphthalene	mg/kg dry wt	-	< 0.02	0.025	-	-
2-Methylnaphthalene	mg/kg dry wt	-	< 0.02	0.027	-	-
Acenaphthylene	mg/kg dry wt	-	< 0.02	0.039	-	-
Acenaphthene	mg/kg dry wt	-	< 0.02	< 0.018	-	-
Anthracene	mg/kg dry wt	-	< 0.02	0.027	-	-
Benzo[a]anthracene	mg/kg dry wt	-	< 0.02	0.044	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	< 0.02	0.044	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	mg/kg dry wt	-	< 0.05	0.08	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)*	mg/kg dry wt	-	< 0.05	0.08	-	-
Benzo[b]fluoranthene + Benzo[j]fluoranthene	mg/kg dry wt	-	< 0.02	0.083	-	-
Benzo[e]pyrene	mg/kg dry wt	-	< 0.02	0.037	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	< 0.02	0.038	-	-
Benzo[k]fluoranthene	mg/kg dry wt	-	< 0.02	0.021	-	-
Chrysene	mg/kg dry wt	-	< 0.02	0.046	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	< 0.02	< 0.018	-	-
Fluoranthene	mg/kg dry wt	-	< 0.02	0.100	-	-
Fluorene	mg/kg dry wt	-	< 0.02	0.041	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	< 0.02	0.044	-	-
Naphthalene	mg/kg dry wt	-	< 0.10	0.14	-	-
Perylene	mg/kg dry wt	-	< 0.02	< 0.018	-	-
Phenanthrene	mg/kg dry wt	-	0.03	0.22	-	-
Pyrene	mg/kg dry wt	-	< 0.02	0.085	-	-

Sample Name:		Pb03 16-Aug-2022	Pb04 16-Aug-2022	Pb05 16-Aug-2022	Pb06 16-Aug-2022	Pb07 16-Aug-2022
Lab Number:		3056055.6	3056055.7	3056055.8	3056055.9	3056055.10
Individual Tests						
Total Recoverable Lead	mg/kg dry wt	81	470	116	1,420	1,730

Sample Name:		Pb08 16-Aug-2022	Pb09 16-Aug-2022	Pb10 16-Aug-2022	HB01 16-Aug-2022	HB02 16-Aug-2022
Lab Number:		3056055.11	3056055.12	3056055.13	3056055.26	3056055.27
Individual Tests						
Total Recoverable Lead	mg/kg dry wt	33	113	96	61	34

Sample Name:		HB03 16-Aug-2022	HB04 16-Aug-2022	HB05 16-Aug-2022	QC01 16-Aug-2022	QC02 16-Aug-2022
Lab Number:		3056055.28	3056055.29	3056055.30	3056055.31	3056055.32
Individual Tests						
Total Recoverable Lead	mg/kg dry wt	32	23	480	92	86

Sample Name:		Composite of Comp01 A, Comp01 B, Comp01 C & Comp01 D	Composite of Comp02 A, Comp02 B, Comp02 C & Comp02 D	Composite of Comp03 A, Comp03 B, Comp03 C & Comp03 D
Lab Number:		3056055.33	3056055.34	3056055.35
Individual Tests				
Dry Matter	g/100g as rcvd	61	64	53
Total Recoverable Arsenic	mg/kg dry wt	5	4	5
Total Recoverable Copper	mg/kg dry wt	19	16	29
Total Recoverable Lead	mg/kg dry wt	22	23	28
Organochlorine Pesticides Screening in Soil				
Aldrin	mg/kg dry wt	< 0.016	< 0.016	< 0.019
alpha-BHC	mg/kg dry wt	< 0.016	< 0.016	< 0.019
beta-BHC	mg/kg dry wt	< 0.016	< 0.016	< 0.019
delta-BHC	mg/kg dry wt	< 0.016	< 0.016	< 0.019

Sample Type: Soil				
Sample Name:		Composite of Comp01 A, Comp01 B, Comp01 C & Comp01 D	Composite of Comp02 A, Comp02 B, Comp02 C & Comp02 D	Composite of Comp03 A, Comp03 B, Comp03 C & Comp03 D
Lab Number:		3056055.33	3056055.34	3056055.35
Organochlorine Pesticides Screening in Soil				
gamma-BHC (Lindane)	mg/kg dry wt	< 0.016	< 0.016	< 0.019
cis-Chlordane	mg/kg dry wt	< 0.016	< 0.016	< 0.019
trans-Chlordane	mg/kg dry wt	< 0.016	< 0.016	< 0.019
2,4'-DDD	mg/kg dry wt	< 0.016	< 0.016	< 0.019
4,4'-DDD	mg/kg dry wt	< 0.016	< 0.016	< 0.019
2,4'-DDE	mg/kg dry wt	< 0.016	< 0.016	< 0.019
4,4'-DDE	mg/kg dry wt	< 0.016	< 0.016	0.048
2,4'-DDT	mg/kg dry wt	< 0.016	< 0.016	< 0.019
4,4'-DDT	mg/kg dry wt	< 0.016	< 0.016	0.035
Total DDT Isomers	mg/kg dry wt	< 0.10	< 0.10	< 0.11
Dieldrin	mg/kg dry wt	< 0.016	< 0.016	< 0.019
Endosulfan I	mg/kg dry wt	< 0.016	< 0.016	< 0.019
Endosulfan II	mg/kg dry wt	< 0.016	< 0.016	< 0.019
Endosulfan sulphate	mg/kg dry wt	< 0.016	< 0.016	< 0.019
Endrin	mg/kg dry wt	< 0.016	< 0.016	< 0.019
Endrin aldehyde	mg/kg dry wt	< 0.016	< 0.016	< 0.019
Endrin ketone	mg/kg dry wt	< 0.016	< 0.016	< 0.019
Heptachlor	mg/kg dry wt	< 0.016	< 0.016	< 0.019
Heptachlor epoxide	mg/kg dry wt	< 0.016	< 0.016	< 0.019
Hexachlorobenzene	mg/kg dry wt	< 0.016	< 0.016	< 0.019
Methoxychlor	mg/kg dry wt	< 0.016	< 0.016	< 0.019

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-13, 26-35
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation May contain a residual moisture content of 2-5%.	-	1, 4-13, 26-35
Total of Reported PAHs in Soil	Sonication extraction, GC-MS analysis. In-house based on US EPA 8270.	0.03 mg/kg dry wt	2-3
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	2-3
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	1, 33-35
Polycyclic Aromatic Hydrocarbons Screening in Soil*	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.002 - 0.05 mg/kg dry wt	2-3
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-3, 33-35
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1, 4-13, 26-35
Total Recoverable Arsenic	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	1, 33-35
Total Recoverable Copper	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	2 mg/kg dry wt	33-35
Total Recoverable Lead	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	0.4 mg/kg dry wt	4-13, 26-35

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES*	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.002 mg/kg dry wt	2-3
Benzo[a]pyrene Toxic Equivalence (TEF)*	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.002 mg/kg dry wt	2-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 18-Aug-2022 and 24-Aug-2022. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

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Certificate of Analysis

Client:	Focus Environmental Services Limited	**Lab No:**	3056335	A2Pv1
Contact:	Cari Llewellyn	**Date Received:**	17-Aug-2022	
	C/- Focus Environmental Services Limited	**Date Reported:**	20-Aug-2022	
	PO Box 11455	**Quote No:**	80876	
	Ellerslie	**Order No:**		
	Auckland 1542	**Client Reference:**	1686.001	
		Add. Client Ref:	Sampled: 16/08/22	
		Submitted By:	Megan Thomas	

Sample Type: Soil

Sample Name:		Asb01 16-Aug-2022	Asb02 16-Aug-2022	Asb03 16-Aug-2022	HB01 16-Aug-2022	HB02 16-Aug-2022
Lab Number:		3056335.1	3056335.2	3056335.3	3056335.4	3056335.5
Asbestos Presence / Absence		Asbestos NOT detected.	Chrysotile (White Asbestos) detected.	Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form		-	Loose fibres,ACM debris	-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	0.022	< 0.001	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	0.022	< 0.001	< 0.001	< 0.001
As Received Weight	g	634.3	590.2	612.0	644.9	600.5
Dry Weight	g	433.2	396.6	560.7	428.0	358.4
Moisture	%	32	33	8	34	40
Sample Fraction >10mm*	g dry wt	36.5	6.4	103.9	21.8	4.2
Sample Fraction <10mm to >2mm*	g dry wt	172.0	145.8	222.7	254.4	166.6
Sample Fraction <2mm*	g dry wt	223.8	243.4	233.7	151.7	187.3
<2mm Subsample Weight*	g dry wt	54.9	55.8	57.6	55.3	51.8
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	0.08616	< 0.00001	< 0.00001	< 0.00001

Sample Name:		HB03 16-Aug-2022	HB04 16-Aug-2022	HB05 16-Aug-2022
Lab Number:		3056335.6	3056335.7	3056335.8
Asbestos Presence / Absence		Asbestos NOT detected.	Asbestos NOT detected.	Asbestos NOT detected.
Description of Asbestos Form		-	-	-
Asbestos in ACM as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001
Asbestos as Fibrous Asbestos as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001
Asbestos as Asbestos Fines as % of Total Sample*	% w/w	< 0.001	< 0.001	< 0.001
As Received Weight	g	604.9	549.6	527.5
Dry Weight	g	396.1	353.7	306.3
Moisture	%	35	36	42

Sample Type: Soil				
Sample Name:		HB03 16-Aug-2022	HB04 16-Aug-2022	HB05 16-Aug-2022
Lab Number:		3056335.6	3056335.7	3056335.8
Sample Fraction >10mm*	g dry wt	11.2	10.5	< 0.1
Sample Fraction <10mm to >2mm*	g dry wt	240.3	218.0	99.7
Sample Fraction <2mm*	g dry wt	144.5	125.1	205.6
<2mm Subsample Weight*	g dry wt	51.5	55.5	54.9
Weight of Asbestos in ACM (Non-Friable)	g dry wt	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Fibrous Asbestos (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001
Weight of Asbestos as Asbestos Fines (Friable)*	g dry wt	< 0.00001	< 0.00001	< 0.00001

Glossary of Terms
• Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
• Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
• ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
• ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
• Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
• Trace - Trace levels of asbestos, as defined by AS4964-2004.
For further details, please contact the Asbestos Team.

Please refer to the BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil.
https://www.branz.co.nz/asbestos

The following assumptions have been made:

1. Asbestos Fines in the <2mm fraction, after homogenisation, is evenly distributed throughout the fraction
2. The weight of asbestos in the sample is unaffected by the ashing process.

Results are representative of the sample provided to Hill Laboratories only.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
New Zealand Guidelines Semi Quantitative Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1-8
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g	1-8
Moisture	Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100.	1 %	1-8
Sample Fraction >10mm*	Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-8
Sample Fraction <10mm to >2mm*	Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-8
Sample Fraction <2mm*	Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	0.1 g dry wt	1-8
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-8
Description of Asbestos Form	Description of asbestos form and/or shape if present. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland.	-	1-8
Weight of Asbestos in ACM (Non-Friable)	Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-8

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Asbestos in ACM as % of Total Sample*	Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-8
Weight of Asbestos as Fibrous Asbestos (Friable)*	Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-8
Asbestos as Fibrous Asbestos as % of Total Sample*	Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-8
Weight of Asbestos as Asbestos Fines (Friable)*	Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 28 Heather Street, Auckland. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.00001 g dry wt	1-8
Asbestos as Asbestos Fines as % of Total Sample*	Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-8
Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample*	Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017.	0.001 % w/w	1-8

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 19-Aug-2022 and 20-Aug-2022. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

Danielle Carter BSc, PGDipSci, MSc
Laboratory Technician - Asbestos

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Certificate of Analysis

Client:	Focus Environmental Services Limited	**Lab No:**	3056484	A2Pv1
Contact:	Cari Llewellyn	**Date Received:**	17-Aug-2022	
	C/- Focus Environmental Services Limited	**Date Reported:**	18-Aug-2022	
	PO Box 11455	**Quote No:**	80876	
	Ellerslie	**Order No:**		
	Auckland 1542	**Client Reference:**	1686.001	
		Submitted By:	Megan Thomas	

Sample Type: Building Material

Sample Name	Lab Number	Sample Category*	Sample Weight on receipt (g)	Asbestos Presence / Absence	Description of Asbestos in Non Homogeneous Samples
PACM01	3056484.1	Fibre Cement	16.04	Asbestos NOT detected. Organic fibres detected.	N/A
PACM02	3056484.2	Fibre Cement	10.11	Chrysotile (White Asbestos) detected. Organic fibres detected.	N/A
PACM03	3056484.3	Fibre Cement	12.19	Chrysotile (White Asbestos) detected.	N/A

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Building Material

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Bulk Material			
Sample Category*	Assessment of sample type. Analysed at Hill Laboratories - Asbestos; 204 Thorndon Quay, Wellington.	-	1-3
Sample Weight on receipt	Sample weight. Analysed at Hill Laboratories - Asbestos; 204 Thorndon Quay, Wellington.	0.01 g	1-3
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 204 Thorndon Quay, Wellington. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-3
Description of Asbestos in Non Homogeneous Samples	Form, dimensions and/or weight of asbestos fibres present. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	-	1-3

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed on 18-Aug-2022. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

Zandra Fenton BSc
Laboratory Technician - Asbestos

PRELIMINARY SITE INVESTIGATION
92 HAMLIN ROAD
ARDMORE
AUCKLAND

For the Attention of:

Winton Land Limited

Reference: FES 1804.003 December 2023

Company Information

Focus Environmental Services Limited

PO Box 11455

Ellerslie

Auckland 1542

Telephone: +64 9 579 4155

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Quality Information

Project Name	Preliminary Site Investigation 92 Hamlin Road, Ardmore, Auckland
Project Number	1804.003
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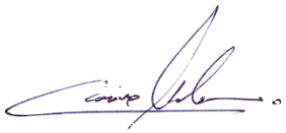

Claire Johnson
Environmental Scientist

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David O'Reilly
Principal Environmental Consultant

Distribution List

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Winton Land Limited	1
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Executive Summary

This Focus Environmental Services Limited report is produced under a management system certified as complying with ISO 45001:2018 by SGS New Zealand.

Focus Environmental Services Limited was contracted by Winton Land Limited to carry out a Preliminary Site Investigation (PSI) at 92 Hamlin Road, Ardmore, Auckland. The legal description of the site is Lot 1 DP 46615 with an area of 0.091ha.

The Sunfield Urban Development Area (UDA) consists of nineteen properties located across Cosgrave Road, Old Wairoa Road, Hamlin Road and Airfield Road, Papakura, Auckland.

The scope of this report is limited to the property at 92 Hamlin Road, and should be read in conjunction with the covering letter summarising the findings of the PSIs and DSIs completed for the Sunfield UDA.

This PSI has been prepared in accordance with the requirements of the Contaminated Land Management Guidelines No. 1 and No. 5 (Ministry for the Environment, Revised 2021).

The history of the site was researched by Focus Environmental Services Limited personnel, which involved a review of the available historical aerial photographs of the site and a review of the Auckland Council property file.

During the review of the available information, the following potentially contaminating activities or land uses were identified:

- Demolition of historic structures potentially containing asbestos;
- The use and maintenance of lead-based paints; and
- The bulk storage of construction materials/ scrap materials.

The information obtained of the site's history was assessed to determine if any potentially hazardous activities listed on the Hazardous Activities and Industries List (HAIL) had occurred on site as a result of past or current land use.

A walkover and site inspection were not possible, as access to the property was not permitted at the time of writing this report. Therefore, the identification of any potential HAIL activities carried out at the site was limited to a desktop assessment. Once access is granted, it is recommended that a site walkover take place to identify any additional potentially contaminating land uses and/or activities that have not been identified in the information made available.

Based on the results of this Preliminary Site Investigation, it is considered that an activity described in the HAIL has been, or is more likely than not to have been, carried out on the site.

Furthermore, as the impact of the HAIL activities identified on the site soils has not been determined, it is recommended that, prior to any earthworks occurring onsite, a detailed site investigation is completed on the property found at 92 Hamlin Road.

The detailed site investigation would confirm if the identified land uses and/or activities have affected the site soils and will confirm the remediation requirements, if any, for the site.

Based on the findings of the preliminary site investigation for the site, it is considered that the regulations of the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health, and the contaminated land

rules as outlined in Chapter E30 of the Auckland Unitary Plan: Operative in Part (AUP: OP), need to be considered and consents under these regulations may be triggered by future development of the site.

The detailed site investigation shall be carried out in general accordance with the Contaminated Land Management Guidelines No. 1 and No. 5 (MfE, Revised 2021).

Following the receipt of the sampling results, a technical report summarising the results of the investigation shall be prepared. The report will be prepared in accordance Contaminated Land Management Guidelines No. 1(MfE, Revised 2021). The report will include:

- Recommendations for any additional investigations if required;
- A statement on whether or not any additional consents are required;
- Recommendations that a Site-Specific Management/Remediation Action Plan is prepared in order to provide controls to mitigate against the potential risks to human health and/or the environment as a result of the effects associated with the site redevelopment works.

All works should be carried out in accordance with the global Site Management Plan titled '*Site Management Plan, Sunfield Urban Development Area*' dated December 2023 and prepared by Focus Environmental Services. If the controls outlined in the Site Management Plan are implemented during the development works, the effects on the environment are likely to be effectively mitigated.

This report is certified by David O'Reilly, Suitability Qualified and Experienced Practitioner (SQEP):

Principal Environmental Consultant
Focus Environmental Services Limited

1.0 Scope

1.1 This report has been prepared at the request of Winton Land Limited ("the Client") in terms of the Focus Environmental Services Agreement ("Agreement").

1.2 The following report is based on:

- *Information provided by the Client;*
- *A review of historical aerial photographs available for the site; and*
- *A search of the Auckland Council Property File.*

1.3 We have not independently verified the information provided to us by the Client or its completeness. We do not express an opinion on the accuracy or the reliability of such information.

1.4 No warranties are given, intended or implied.

1.5 Opinion, inferences, assumptions and interpretations made in this report should not be construed as legal opinion.

1.6 Where an assessment is given in this report, the Client must also rely upon their own judgement, knowledge and assessment of the subject of this report before undertaking any action.

1.7 This report must not be used in any other context or for any other purpose other than that for which it has been prepared without the prior written consent of Focus Environmental Services.

1.8 This report is strictly confidential and intended for the sole use of the Client and shall not be disclosed without the prior written consent of Focus Environmental Services.

1.9 This Focus Environmental Services Limited report is produced under a management system certified as complying with ISO 45001:2018 by SGS New Zealand.

2.0 Site Identification

The property is located at 92 Hamlin Road, Ardmore, Auckland as shown in Figure 1 attached. The legal description of the site is Lot 1 DP 46615 with an area of 0.091ha. The site is located at national grid reference 1774745mE and 5899334mN.

The site is rectangular in shape and is zoned 'Rural – Mixed Rural Zone' under the AUP: OP.

The site location plan is presented as Figure 1.

3.0 Proposed Site Redevelopment Activity

It is proposed that the site will be redeveloped for residential purposes. As part of the redevelopment, the site will undergo subdivision, a change of land use and disturbance of soils.

The illustrative masterplan is attached as Appendix A.

4.0 Site Topography

The property at 92 Hamlin Road, Ardmore has a generally flat landscape.

The site contour plan is presented in Appendix B.

5.0 Geology and Hydrology

Published geological maps[1] indicate the site is typically underlain with alluvial deposits of the Puketoka Formation. A description of the underlying geology is presented in Table 1 below.

Table 1: Geology of 92 Hamlin Road, Ardmore.

Key name	Late Pliocene to Middle Pleistocene pumiceous river deposits
Simple name	Neogene sedimentary rocks
Main rock name	Sand
Description	Pumiceous mud, sand and gravel with muddy peat and lignite; rhyolite pumice, including non-welded ignimbrite, tephra and alluvial pumice deposits
Subsidiary rocks	Mud, gravel, peat, lignite, tephra, pumice
Key group	Late Pliocene to Middle Pleistocene sediments
Stratigraphic lexicon name	Puketoka Formation
Absolute age (min)	0.071 million years
Absolute age (max)	3.599 million years
Rock group	Sandstone
Rock class	Clastic sediment

No groundwater investigation was carried out as part of this investigation.

The nearest surface water body is the unnamed, open stream located approximately 253m to the south-west of the site.

[1] Geology of the Auckland Area (Institute of Geological & Nuclear Sciences 1:250,000 geological map 3, 2011)

6.0 Regulatory Framework

6.1 The National Environmental Standard

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES) came into effect on the 1st of January 2012 and supersedes any District Plan rules that related to contaminated land. Any Regional Plan rules relating to contaminated land are still applicable.

In brief, the objective of the NES is to ensure that land affected by contaminants is identified and assessed and, if necessary, remediated or managed to protect human health. The NES only applies to the activities: removing or replacing all, or part of, a fuel storage system; sampling the soil; disturbing the soil; subdividing the land; and changing the land use, and where an activity or industry described in the Hazardous Activities and Industries List (HAIL) is being, has been, or is more likely than not to have been undertaken on the piece of land.

The NES also contains reference to the Soil Contaminant Standards for human health ($SCS_{(health)}$), for a variety of land use scenarios along with reference to best practice reporting documents.

The environmental HAIL is attached as Appendix C.

6.2 The National Environmental Standard

The contaminated land rules of the Auckland Unitary Plan: Operative in Part (AUP: OP) have immediate legal effect following its notification. As the AUP: OP was notified on the 15th of November 2016 the contaminated land rules of the AUP: OP must be considered.

In brief, the objective of the AUP: OP is to manage land containing elevated levels of contaminants to protect human health and the environment and to enable the effective use of the land.

The contaminated land rules of the AUP: OP apply when the land contains contaminants above those levels specified in Table E30.6.1.4.1 of Chapter E30 of the AUP: OP.

7.0 Site History

The history of the site was researched by Focus Environmental Services Limited personnel, which involved a review of the available historical aerial photographs of the site, a review of the Auckland Council property file and a review of the Historical Certificate of Title.

7.1 Historical Aerial Photographs

Descriptions of the historical aerial photographs for the subject site are presented in Table 2 below. The historical aerial photographs are presented in Appendix D.

Table 2: Historical Photographs: 92 Hamlin Road, Ardmore.

Date	Description
1959	The 1959 historical photograph shows that the subject site is part of a larger parcel of land in use for rural purposes. In the area of the subject site a large pile of construction debris is observed. Hamlin road is visible directly to the south of the subject site. The surrounding properties appear to be in use for a mix of rural and rural-residential purposes. Ardmore Aerodrome is visible to the north-east of the site.
1960	The 1960 historical photograph shows the subject site has been subdivided from the larger parcel of land and is now in use for residential purposes. A dwelling has been constructed in the centre of the site. The surrounding properties remain in use for rural and rural – residential purposes.
1975 - 2008	The 1975 – 2008 historical photographs show the subject site remains in use for residential purposes. A garage (HB01) has been constructed in the north-eastern corner of the site accessed by a driveway leading from the south-eastern corner of the site. A shed and attached carport have also been constructed in the north-western corner of the site. The 1981 historical photograph shows that a driveway has been constructed along the western boundary of the site leading to the shed. The 2008 historical photograph shows that the two driveways have been connected by a hard-seal area to the south of the dwelling.
2008 - 2017	The 2010 – 2017 historical photographs show the subject relatively unchanged from the previous time period. The 2010 historical photograph shows that all of the site buildings have been re-roofed. In addition, the garage has been replaced with a smaller structure in the same location. The original footprint is still visible. The surrounding properties remain in use for rural and rural – residential purposes.

Due to the age of the current and former (HB01) site buildings (pre-1988) located across the site, it is considered likely that lead-based paints would have been utilised in the external building materials.

In addition, it is considered likely that potentially asbestos containing materials would have been used in the construction of the current and former site buildings (pre-2000).

7.2 Previous Investigations

At the time of writing this report, the results of a geotechnical investigation covering the site was not available. If future geotechnical investigations identify uncertified fills, these shall be investigated as part of any Detailed Site Investigation completed accordingly.

7.3 Auckland Council Property File Search

The results of the council search showed one consent relating to the site at 92 Hamlin Road, Ardmore. The relevant details of the Property File search are presented in Table 3 below.

Table 3: Relevant Property File Information: 92 Hamlin Road, Ardmore

Proposed Activity	Applicant	Reference	Date
Building Consent – Conservatory on existing concrete deck	Priscilla Edbrooke	22523	29/11/2006

8.0 Site Walkover and Inspection

A walkover and site inspection were not possible at the time of writing the report as access to the property was not permitted. Therefore, the identification of any potential HAIL activities carried out at the site was limited to a desktop assessment. Once access is received, a walkover should take place to identify any additional potentially contaminating land uses and/ or activities that have not been identified as part of the desktop assessment.

The site features able to be identified as part of the desktop assessment are presented as Figure 2.

9.0 Surrounding Environment

The surrounding environment appeared to be predominantly in use for rural and rural-residential purposes. Ardmore Aerodrome is observed to the north-east of the site. Residential properties were observed further south-west in the wider area.

No significant horticultural land use can be observed on the properties neighbouring the subject site.

The surrounding environment is presented as Figure 3.

10.0 Asbestos Management

Due to the age of the current and historical site buildings (pre-1996), external PACM products are likely to be present in the construction materials.

Any removal of asbestos materials from the site will need to be conducted in accordance with the Health and Safety at Work (Asbestos) Regulations (MBIE, 2016) and the Approved Code of Practice for the Management and Removal of Asbestos (WorkSafe New Zealand, 2016) by a licensed asbestos removals specialist under an approved asbestos removal control plan.

It should be noted that ACM, other than that described, may also be present at the site and a thorough inspection should be carried out by a suitably qualified and competent asbestos surveyor prior to any demolition activities at the site.

11.0 Potentially Contaminating Activities or Land Uses

Following a review of the history and the available information relating to the site located at 92 Hamlin Road, Ardmore the potentially contaminating land uses and/or activities identified have been summarised in Table 3 below.

Table 3: Potential Contaminating Activities and/or Land Uses: 92 Hamlin Road, Ardmore.

Activity Description	HAIL Category
Demolition of Historic Structures Potentially Containing Asbestos	E1
Maintenance and Use of Lead-based Paint	I
Bulk Storage of Construction Materials/ Scrap Material	

12.0 Conceptual Model of Exposure Pathways

The assessment provided in Table 4 below expands on the potential sources of contamination identified within the site and was based on the potential effects of the subdivision, change of land use and soil disturbance activities on human health and the environment associated with future residential development.

Table 4: Conceptual Site Model: 92 Hamlin Road, Ardmore.

Potential Source	Potential Pathways	Potential Receptors	Assessment
Contaminated Soil	Dermal Contact with Contaminated Soils	Human Health – Residential Land Use	Potentially Complete: Sampling and analysis are recommended to confirm the concentrations of contaminants in soil.
		Human Health – Commercial/Industrial Outdoor Worker	Potentially Complete: Sampling and analysis are recommended to confirm the concentrations of contaminants in soil.
	Ingestion of Contaminated Soils	Human Health – Residential Land Use	Potentially Complete: Sampling and analysis are recommended to confirm the concentrations of contaminants in soil.
		Human Health – Commercial/Industrial Outdoor Worker	Potentially Complete: Sampling and analysis are recommended to confirm the concentrations of contaminants in soil.
	Inhalation of Vapours/Fibres	Human Health – Residential Land Use	Potentially Complete: Sampling and analysis are recommended to confirm the concentrations of contaminants in soil.
		Human Health – Commercial/Industrial Outdoor Worker	Potentially Complete: Sampling and analysis are recommended to confirm the concentrations of contaminants in soil.
	Surface Water Run-off	Ecological Receptors - Unnamed Open Stream	Potentially Complete: Sampling and analysis are recommended to confirm the concentrations of contaminants in soil.

	Migration of Groundwater	Ecological Receptors - Unnamed Open Stream	Potentially Complete: Sampling and analysis are recommended to confirm the concentrations of contaminants in soil.

13.0 Regulatory Requirements

13.1 The National Environmental Standard

Potentially contaminating activities and/or land uses were identified across the site, and in the area of proposed development, therefore it is considered that consent under the regulations of the NES may be triggered by future development of the site.

Prior to the development of the site where potentially contaminating land uses and/or activities have taken place, a detailed site investigation (DSI) is recommended. The DSI would confirm if the identified land uses and/or activities have affected the site soils and will confirm the consenting requirements for these areas of the site. The DSI shall be prepared in general accordance with the requirements of the Contaminated Land Management Guidelines No. 1 and No. 5 (MfE, Revised 2021).

13.2 Auckland Unitary Plan (Operative in Part)

The contaminated land rules of the Auckland Unitary Plan - Operative in Part (AUP OP) have immediate legal effect following its notification. As the AUP OP was notified on the 15th of November 2016 the contaminated land rules must be considered.

As potentially contaminating activities and/or land uses were identified across the site, the contaminated land rules of the AUP: OP may be triggered by future development of the site.

14.0 Conclusions and Recommendations

This PSI has been prepared in accordance with the requirements of the Contaminated Land Management Guidelines No. 1 and No. 5 (Ministry for the Environment, Revised 2021).

The history of the site was researched by Focus Environmental Services Limited personnel, which involved a review of the available historical aerial photographs of the site and a review of the Auckland Council property file.

During the review of the available information, the following potentially contaminating activities or land uses were identified:

- Demolition of historic structures potentially containing asbestos;
- The use and maintenance of lead-based paints; and
- The bulk storage of construction materials/ scrap materials.

The information obtained of the site's history was assessed to determine if any potentially hazardous activities listed on the Hazardous Activities and Industries List (HAIL) had occurred on site as a result of past or current land use.

A walkover and site inspection were not possible, as access to the property was not permitted at the time of writing this report. Therefore, the identification of any potential HAIL activities carried out at the site was limited to a desktop assessment. Once access is granted, it is recommended that a site walkover take place to identify any additional potentially contaminating land uses and/or activities that have not been identified in the information made available.

Based on the results of this Preliminary Site Investigation, it is considered that an activity described in the HAIL has been, or is more likely than not to have been, carried out on the site.

Furthermore, as the impact of the HAIL activities identified on the site soils has not been determined, it is recommended that, prior to any earthworks occurring onsite, a detailed site investigation is completed on the property found at 92 Hamlin Road.

The detailed site investigation would confirm if the identified land uses and/or activities have affected the site soils and will confirm the remediation requirements, if any, for the site.

Based on the findings of the preliminary site investigation for the site, it is considered that the regulations of the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health, and the contaminated land rules as outlined in Chapter E30 of the Auckland Unitary Plan: Operative in Part (AUP: OP), need to be considered and consents under these regulations may be triggered by future development of the site.

The detailed site investigation shall be carried out in general accordance with the Contaminated Land Management Guidelines No. 1 and No. 5 (MfE, Revised 2021).

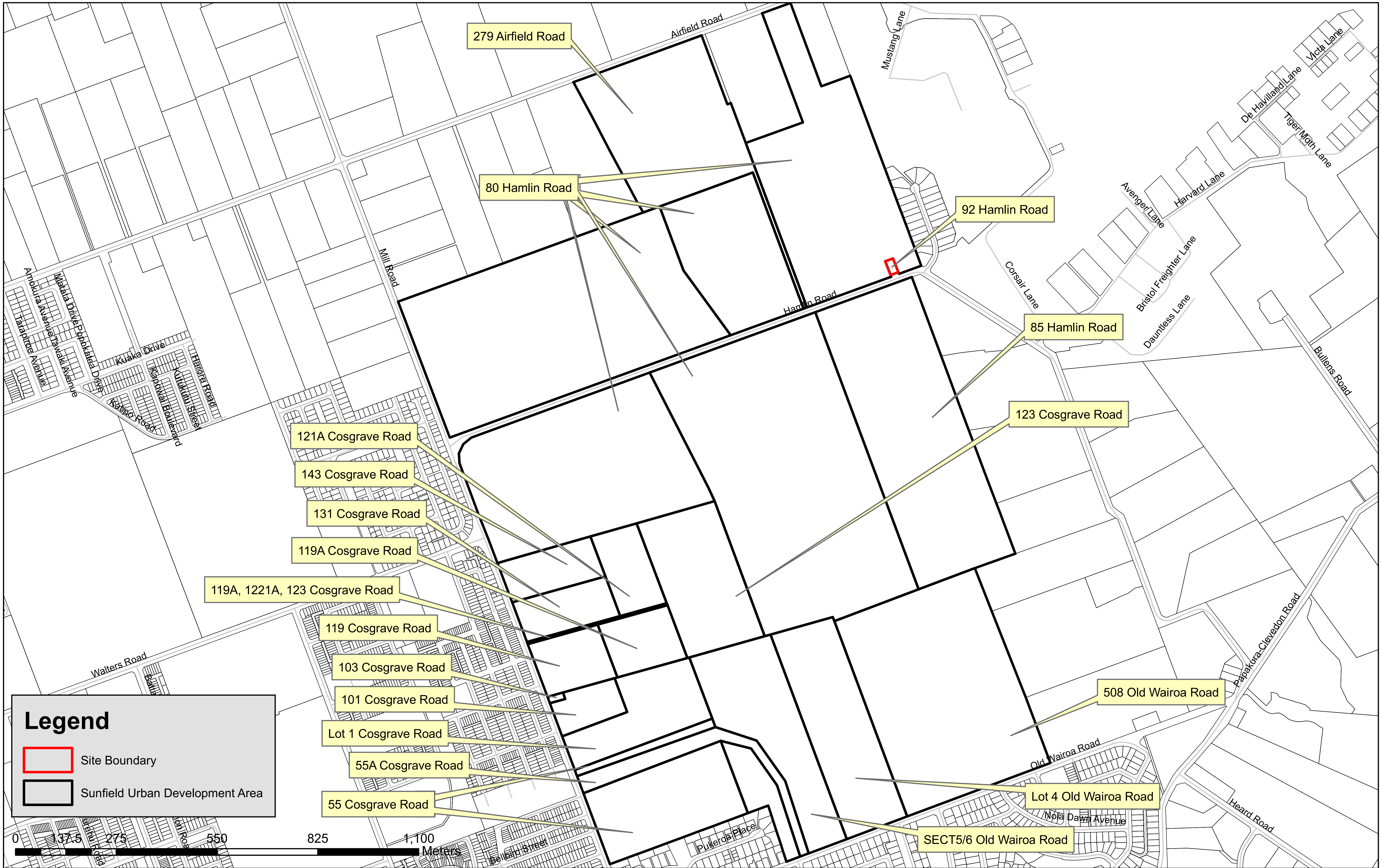
Following the receipt of the sampling results, a technical report summarising the results of the investigation shall be prepared. The report will be prepared in accordance Contaminated Land Management Guidelines No. 1(MfE, Revised 2021). The report will include:

- Recommendations for any additional investigations if required;
- A statement on whether or not any additional consents are required;

- Recommendations that a Site-Specific Management/Remediation Action Plan is prepared in order to provide controls to mitigate against the potential risks to human health and/or the environment as a result of the effects associated with the site redevelopment works.

All works should be carried out in accordance with the global Site Management Plan titled *'Site Management Plan, Sunfield Urban Development Area'* dated December 2023 and prepared by Focus Environmental Services. If the controls outlined in the Site Management Plan are implemented during the development works, the effects on the environment are likely to be effectively mitigated.

Figures


279 Airfield Road
80 Hamlin Road
92 Hamlin Road
85 Hamlin Road
123 Cosgrave Road
121A Cosgrave Road
143 Cosgrave Road
131 Cosgrave Road
119A Cosgrave Road
119A, 1221A, 123 Cosgrave Road
119 Cosgrave Road
103 Cosgrave Road
101 Cosgrave Road
Lot 1 Cosgrave Road
55A Cosgrave Road
55 Cosgrave Road
508 Old Wairoa Road
Lot 4 Old Wairoa Road
SECT5/6 Old Wairoa Road
Airfield Road
Hamlin Road
Mill Road
Mustang Lane
Corsair Lane
Avenger Lane
Harvard Lane
De Havilland Lane
Victa Lane
Tiger Moth Lane
Bristol Freighter Lane
Dauntless Lane
Bullens Road
Papakura-Clevedon Road
Old Wairoa Road
Nola Dawn Avenue
Heard Road
Walters Road
Kuaka Drive
Pukerola Place
Belfast Street
Legend
Site Boundary
Sunfield Urban Development Area
0 137.5 275 550 825 1,100
Meters

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Winton Land Limited
92 Hamlin Road
Sunfield Urban Development Area
Papakura
Auckland

Figure 1: Site Location Plan

Preliminary Site Investigation

1804.003

Drawing Number: 1804.003.01	
Drawn By: MT	
Checked By: DO'R	
Date: 05/12/2023	

Site Features	Description
1	Site Entrance (1)
2	Site Entrance (2)
3	Dwelling
4	Garage
5	Shed
6	Attached carport

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Figure 2: Site Features Plan

Preliminary Site Investigation

1804.003

Drawing Number: 1804.003.02
Drawn By: MT
Checked By: DO'R
Date: 05/12/2023

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Figure 3: Surrounding Environment

Preliminary Site Investigation

1804.003

Drawing Number: 1804.003.03
Drawn By: MT
Checked By: DO'R
Date: 05/12/2023

Appendices

Appendix A – Illustrative Masterplan

Appendix B – Site Contour Plan

Site Contour Plan

0 2.5 5 7.5
Meters

Scale @ A4
= 1:500

Date Printed:
5/12/2023

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix C – Environmental HAIL

Ministry for the Environment
Manatū Mō Te Taiao

Hazardous Activities and Industries List (HAIL)

October 2011

A Chemical manufacture, application and bulk storage

1. Agrichemicals including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application
2. Chemical manufacture, formulation or bulk storage
3. Commercial analytical laboratory sites
4. Corrosives including formulation or bulk storage
5. Dry-cleaning plants including dry-cleaning premises or the bulk storage of dry-cleaning solvents
6. Fertiliser manufacture or bulk storage
7. Gasworks including the manufacture of gas from coal or oil feedstocks
8. Livestock dip or spray race operations
9. Paint manufacture or formulation (excluding retail paint stores)
10. Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds
11. Pest control including the premises of commercial pest control operators or any authorities that carry out pest control where bulk storage or preparation of pesticide occurs, including preparation of poisoned baits or filling or washing of tanks for pesticide application
12. Pesticide manufacture (including animal poisons, insecticides, fungicides or herbicides) including the commercial manufacturing, blending, mixing or formulating of pesticides
13. Petroleum or petrochemical industries including a petroleum depot, terminal, blending plant or refinery, or facilities for recovery, reprocessing or recycling petroleum-based materials, or bulk storage of petroleum or petrochemicals above or below ground
14. Pharmaceutical manufacture including the commercial manufacture, blending, mixing or formulation of pharmaceuticals, including animal remedies or the manufacturing of illicit drugs with the potential for environmental discharges
15. Printing including commercial printing using metal type, inks, dyes, or solvents (excluding photocopy shops)
16. Skin or wool processing including a tannery or fellmongery, or any other commercial facility for hide curing, drying, scouring or finishing or storing wool or leather products
17. Storage tanks or drums for fuel, chemicals or liquid waste
18. Wood treatment or preservation including the commercial use of anti-sapstain chemicals during milling, or bulk storage of treated timber outside

B Electrical and electronic works, power generation and transmission

1. Batteries including the commercial assembling, disassembling, manufacturing or recycling of batteries (but excluding retail battery stores)

2. Electrical transformers including the manufacturing, repairing or disposing of electrical transformers or other heavy electrical equipment
3. Electronics including the commercial manufacturing, reconditioning or recycling of computers, televisions and other electronic devices
4. Power stations, substations or switchyards

C Explosives and ordinances production, storage and use

1. Explosive or ordinance production, maintenance, dismantling, disposal, bulk storage or re-packaging
2. Gun clubs or rifle ranges, including clay targets clubs that use lead munitions outdoors
3. Training areas set aside exclusively or primarily for the detonation of explosive ammunition

D Metal extraction, refining and reprocessing, storage and use

1. Abrasive blasting including abrasive blast cleaning (excluding cleaning carried out in fully enclosed booths) or the disposal of abrasive blasting material
2. Foundry operations including the commercial production of metal products by injecting or pouring molten metal into moulds
3. Metal treatment or coating including polishing, anodising, galvanising, pickling, electroplating, or heat treatment or finishing using cyanide compounds
4. Metalliferous ore processing including the chemical or physical extraction of metals, including smelting, refining, fusing or refining metals
5. Engineering workshops with metal fabrication

E Mineral extraction, refining and reprocessing, storage and use

1. Asbestos products manufacture or disposal including sites with buildings containing asbestos products known to be in a deteriorated condition
2. Asphalt or bitumen manufacture or bulk storage (excluding single-use sites used by a mobile asphalt plant)
3. Cement or lime manufacture using a kiln including the storage of wastes from the manufacturing process
4. Commercial concrete manufacture or commercial cement storage
5. Coal or coke yards
6. Hydrocarbon exploration or production including well sites or flare pits
7. Mining industries (excluding gravel extraction) including exposure of faces or release of groundwater containing hazardous contaminants, or the storage of hazardous wastes including waste dumps or dam tailings

F Vehicle refuelling, service and repair

1. Airports including fuel storage, workshops, washdown areas, or fire practice areas
2. Brake lining manufacturers, repairers or recyclers
3. Engine reconditioning workshops
4. Motor vehicle workshops
5. Port activities including dry docks or marine vessel maintenance facilities

6. Railway yards including goods-handling yards, workshops, refuelling facilities or maintenance areas
7. Service stations including retail or commercial refuelling facilities
8. Transport depots or yards including areas used for refuelling or the bulk storage of hazardous substances

G Cemeteries and waste recycling, treatment and disposal

1. Cemeteries
2. Drum or tank reconditioning or recycling
3. Landfill sites
4. Scrap yards including automotive dismantling, wrecking or scrap metal yards
5. Waste disposal to land (excluding where biosolids have been used as soil conditioners)
6. Waste recycling or waste or wastewater treatment

H Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment

I Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment

Appendix D – Historical Aerial Photographs

Historical Aerial Photographs

92 Hamlin Road
Ardmore
Auckland

by Focus Environmental Services Limited