Table 1
Hakitekura PSI
Soil Analytical Results

				Heavy metals										BTEX				OCP				TPH				PAH	
				Arsenic	Beryllium	Boron	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toulene	Ethylbenzene	Total Xylenes	Total DDT	Aldrin	Dieldrin	Endrin	C7-C9	C10-C14	C15-C36	C7-C36 (total)	Naphthalene	Benzo(a)pyrene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
PQL				0.125	0.013	1.25	0.005	0.125	0.075	0.25	0.025	0.05	0.05	0.05	0.05	0.05	0.1	0.02	0.005	0.05	0.05	10	15	25	50	0.1	0.03
Human health criteria																											
Commercial/industrial outdoor worker[1]				**70**	**-**	**NL**	**1,300**	**6,300**	**NL**	**3,300**	**4,200**	**6,000[2]**	**400,000[2]**	**3[3]**	**94[3]**	**180[3]**	**150[3]**	**1000[4]**	**-**	**160**	**-**	**120[3]**	**1500[3]**	**NA**	**NA**	**-**	**35**
Background concentrations																											
LRIS 95% Predicted background concentration (Silt)[5]				11.08	-	-	0.13	116.1	37.42	52.54	-	97.44	167	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waste Disposal[6]																											
Class A				100	200	400	20	100	100	100	4	200	200	10	2000	1000	2000	500	-	8	-	-	-	-	-	200	300
Class B				*10*	*20*	*40*	*2*	*10*	*10*	*10*	*0.4*	*20*	*20*	*1*	*200*	*100*	*200*	*50*	-	*0.8*	-	-	-	-	-	*20*	*30*
Sample Location	Depth of sample (mBGL)	Material Type	Date Collected																								
UOH01	0.2	SAND	1-May-20	*12.0*	0.17	1.4	0.824	*19.1*	3250	*82.1*	<0.025	4.90	2120	<0.05	<0.05	<0.05	<0.10	-	-	-	-	<10	<15	134	134	<0.01	0.01
	0.2 Duplicate			*12.0*	0.17	1.3	0.931	*18.7*	3190	*88.9*	<0.025	5.37	2480	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH02	0.2			9.9	0.15	2.8	0.785	*12.7*	*66.8*	*47.7*	0.03	5.20	4110	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH03	0.2			10.0	0.30	1.5	0.420	*12.0*	*28.8*	*20.9*	<0.025	10.10	699	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH06	0.2			6.2	0.16	4.3	0.23	7.2	*12.30*	*15.8*	0.033	5.82	*99.0*	-	-	-	-	<0.02	<0.005	<0.05	<0.05	-	-	-	-	-	-
UOH07	0.2			6.3	0.15	4.3	0.558	8.7	*24.10*	*17.6*	0.050	5.95	340	-	-	-	-	<0.02	<0.005	*2.48*	<0.05	-	-	-	-	-	-
	0.5			8.2	0.16	3.6	0.33	8.3	*18.20*	*16.7*	0.038	5.50	212	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH08	0.2			4.4	0.20	4.7	0.35	5.5	*14.00*	*15.5*	0.034	4.90	*185*	-	-	-	-	<0.02	<0.005	<0.05	<0.05	-	-	-	-	-	-
UOH09	0.2			9.3	0.13	4.5	0.806	*12.0*	*28.30*	8.0	0.039	5.81	*117*	-	-	-	-	<0.02	<0.005	<0.05	<0.05	-	-	-	-	-	-
UOH10	0.2			5.0	0.17	1.5	*10.1*	8.5	*19.00*	*33.9*	0.028	9.24	394	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH11	0.2			6.5	0.19	1.9	23.1	9.5	*17.30*	*23.7*	<0.025	7.17	308	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH12	0.2			*15.7*	0.16	3.6	*3.51*	*20.0*	*35.00*	*20.7*	0.043	6.03	435	-	-	-	-	<0.02	<0.005	<0.05	<0.05	-	-	-	-	-	-
UOH13	0.2			7.2	0.33	4.0	1.04	*10.0*	*29.10*	*96.6*	0.057	8.23	344	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH14	0.2			12.0	0.21	7.1	0.724	*17.4*	*23.00*	9.9	0.026	10.60	205	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH15	0.2			13.9	0.18	12.0	1.03	*20.2*	*49.20*	*20.6*	0.029	10.50	495	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH16	0.2			9.0	0.32	<1.3	0.075	*11.0*	*13.60*	*12.5*	<0.025	10.40	*52.7*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH17	0.2			10.0	0.28	1.4	0.14	*11.0*	*17.20*	*17.8*	<0.025	11.00	*98.1*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH18	0.2			*42.9*	0.34	4.4	0.807	*23.9*	*46.80*	*18.4*	0.047	*22.80*	427	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH20	0.2			7.3	0.09	14.0	0.49	6.8	*31.00*	*99.2*	0.170	6.02	401	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UOH21	0.2			6.6	0.21	13.0	1.32	*49.1*	*72.20*	898	0.300	8.34	1350	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[1] Methodology for Deriving Soil Guideline Values Protective of Human Health (MfE, 2011)
[2] NEPM (2011) National Enviornment Protection (Assessment of Site Contamination) Measure - Schedule B1, Table 1A(1)
[3] Mfe (2011) guidelines for Assessing and managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Module 4 - Tier 1 Soil Screening Criteria Table 4.12
[4] Guideline on the Investigation Levels for Soil and Groundwater (NEPC, 1999)
[5] LRIS Predicted Background Soil Contaminants, New Zealand, Landcare Research Limited, Updated 2016
[6] MfE (2004) Module 2 – Hazardous Waste Guidelines: Landfill Waste Acceptance Criteria and Landfill Classification; Appendix A Total Concentration for Leachability Limits for Class A and Class B Landfills

Above Human Health Guidelines
Above Background Concentrations
Above Waste Disposal Criteria - Class A
Above Waste Disposal Criteria - Class B
NL - No limit
- No data

Table 2
Hakitekura DSI
Soil analytical results - RPDs

		Metals									
		Arsenic	**Beryllium**	**Boron**	**Cadmium**	**Chromium (III+VI)**	**Copper**	**Lead**	**Mercury**	**Nickel**	**Zinc**
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
UOH01	0.2	*12.0*	0.17	1.4	0.824	*19.1*	3250	*82.1*	<0.025	4.90	2120
	0.2 (Duplicate)	*12.0*	0.17	1.3	0.931	*18.7*	3190	*88.9*	<0.025	5.37	2480
RPD (%)		**0%**	**0%**	**7%**	**12%**	**2%**	**2%**	**8%**	**0%**	**9%**	**16%**

Exceeds background concentrations

Analytica Laboratories Limited
Ruakura Research Centre
10 Bisley Road
Hamilton 3214, New Zealand
Ph +64 (07) 974 4740
sales@analytica.co.nz
www.analytica.co.nz

Certificate of Analysis

WSP New Zealand Limited
69 Tarbert Street
Alexandra 9320

Attention: Megan Baddiley
Phone: 021 233 6761
Email: megan.baddiley@wsp.com

Sampling Site: Hakitekura

Lab Reference: 20-16506
Submitted by: MB
Date Received: 8/05/2020
Testing Initiated: 13/05/2020
Date Completed: 19/05/2020
Order Number: N/A
Reference: UOH

Report Comments

Samples were collected by yourselves (or your agent) and analysed as received at Analytica Laboratories. Samples were in acceptable condition unless otherwise noted on this report.
Specific testing dates are available on request.

AMENDED REPORT. This report replaces in full a previous version [R00] sent on [19/05/2020]. [fractions 5, 6, 23 and 24 removed as per client request].

Heavy Metals in Soil

	Client Sample ID		UOH1 0.2	UOH1_DUP	UOH2 0.2	UOH3 0.2	UOH6 0.2
	Date Sampled		1/05/2020	1/05/2020	1/05/2020	1/05/2020	1/05/2020
Analyte	Unit	*Reporting Limit*	20-16506-1	20-16506-2	20-16506-3	20-16506-4	20-16506-7
Arsenic	mg/kg dry wt	*0.125*	12	12	9.9	10	6.2
Beryllium	mg/kg dry wt	*0.013*	0.17	0.17	0.15	0.30	0.16
Boron	mg/kg dry wt	*1.25*	1.4	1.3	2.8	1.5	4.3
Cadmium	mg/kg dry wt	*0.005*	0.824	0.931	0.785	0.42	0.23
Chromium	mg/kg dry wt	*0.125*	19.1	18.7	12.7	12	7.2
Copper	mg/kg dry wt	*0.075*	3,250	3,190	66.8	28.8	12.3
Lead	mg/kg dry wt	*0.25*	82.1	88.9	47.7	20.9	15.8
Mercury	mg/kg dry wt	*0.025*	<0.025	<0.025	0.030	<0.025	0.033
Nickel	mg/kg dry wt	*0.05*	4.9	5.37	5.20	10.1	5.82
Zinc	mg/kg dry wt	*0.05*	2,120	2,480	4,110	699	99.0

Heavy Metals in Soil

	Client Sample ID		UOH7 0.2	UOH7 0.5	UOH8 0.2	UOH9 0.2	UOH10 0.2
	Date Sampled		1/05/2020	1/05/2020	1/05/2020	1/05/2020	1/05/2020
Analyte	Unit	*Reporting Limit*	20-16506-8	20-16506-9	20-16506-10	20-16506-11	20-16506-12
Arsenic	mg/kg dry wt	*0.125*	6.3	8.2	4.4	9.3	5.0
Beryllium	mg/kg dry wt	*0.013*	0.15	0.16	0.20	0.13	0.17
Boron	mg/kg dry wt	*1.25*	4.3	3.6	4.7	4.5	1.5

IANZ ACCREDITED LABORATORY

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation, with the exception of tests marked *, which are not accredited.

Heavy Metals in Soil

			Client Sample ID	UOH7 0.2	UOH7 0.5	UOH8 0.2	UOH9 0.2	UOH10 0.2
			Date Sampled	1/05/2020	1/05/2020	1/05/2020	1/05/2020	1/05/2020
Cadmium	mg/kg dry wt	*0.005*		0.558	0.33	0.35	0.806	10.1
Chromium	mg/kg dry wt	*0.125*		8.7	8.3	5.5	12	8.5
Copper	mg/kg dry wt	*0.075*		24.1	18.2	14.0	28.3	19.0
Lead	mg/kg dry wt	*0.25*		17.6	16.7	15.5	8.02	33.9
Mercury	mg/kg dry wt	*0.025*		0.050	0.038	0.034	0.039	0.028
Nickel	mg/kg dry wt	*0.05*		5.95	5.50	4.9	5.81	9.24
Zinc	mg/kg dry wt	*0.05*		340	212	185	117	394

Heavy Metals in Soil

			Client Sample ID	UOH11 0.2	UOH12 0.2	UOH13 0.2	UOH14 0.2	UOH15 0.2
			Date Sampled	1/05/2020	1/05/2020	1/05/2020	1/05/2020	1/05/2020
Analyte	Unit	*Reporting Limit*		20-16506-13	20-16506-14	20-16506-15	20-16506-16	20-16506-17
Arsenic	mg/kg dry wt	*0.125*		6.5	15.7	7.2	12	13.9
Beryllium	mg/kg dry wt	*0.013*		0.19	0.16	0.33	0.21	0.18
Boron	mg/kg dry wt	*1.25*		1.9	3.6	4.0	7.1	12
Cadmium	mg/kg dry wt	*0.005*		23.1	3.51	1.04	0.724	1.03
Chromium	mg/kg dry wt	*0.125*		9.5	20.0	10	17.4	20.2
Copper	mg/kg dry wt	*0.075*		17.3	35.0	29.1	23.0	49.2
Lead	mg/kg dry wt	*0.25*		23.7	20.7	96.6	9.87	20.6
Mercury	mg/kg dry wt	*0.025*		<0.025	0.043	0.057	0.026	0.029
Nickel	mg/kg dry wt	*0.05*		7.17	6.03	8.23	10.6	10.5
Zinc	mg/kg dry wt	*0.05*		308	435	344	205	495

Heavy Metals in Soil

			Client Sample ID	UOH16 0.2	UOH17 0.2	UOH18 0.2	UOH20 0.2	UOH21 0.2
			Date Sampled	1/05/2020	1/05/2020	1/05/2020	1/05/2020	1/05/2020
Analyte	Unit	*Reporting Limit*		20-16506-18	20-16506-19	20-16506-20	20-16506-21	20-16506-22
Arsenic	mg/kg dry wt	*0.125*		9.0	10	42.9	7.3	6.6
Beryllium	mg/kg dry wt	*0.013*		0.32	0.28	0.34	0.089	0.21
Boron	mg/kg dry wt	*1.25*		<1.3	1.4	4.4	14	13
Cadmium	mg/kg dry wt	*0.005*		0.075	0.14	0.807	0.49	1.32
Chromium	mg/kg dry wt	*0.125*		11	11	23.9	6.8	49.1
Copper	mg/kg dry wt	*0.075*		13.6	17.2	46.8	31.0	72.2
Lead	mg/kg dry wt	*0.25*		12.5	17.8	18.4	99.2	898
Mercury	mg/kg dry wt	*0.025*		<0.025	<0.025	0.047	0.17	0.30
Nickel	mg/kg dry wt	*0.05*		10.4	11.0	22.8	6.02	8.34
Zinc	mg/kg dry wt	*0.05*		52.7	98.1	427	401	1,350

Organochlorine Pesticides - Soil

			Client Sample ID	UOH6 0.2	UOH7 0.2	UOH8 0.2	UOH9 0.2	UOH12 0.2
			Date Sampled	1/05/2020	1/05/2020	1/05/2020	1/05/2020	1/05/2020
Analyte	Unit	*Reporting Limit*		20-16506-7	20-16506-8	20-16506-10	20-16506-11	20-16506-14
2,4'-DDD	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
2,4'-DDE	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
2,4'-DDT	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
4,4'-DDD	mg/kg dry wt	*0.003*		<0.003	<0.003	<0.003	<0.003	<0.003
4,4'-DDE	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005

Organochlorine Pesticides - Soil

			Client Sample ID	UOH6 0.2	UOH7 0.2	UOH8 0.2	UOH9 0.2	UOH12 0.2
			Date Sampled	1/05/2020	1/05/2020	1/05/2020	1/05/2020	1/05/2020
4,4'-DDT	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
Total DDT	mg/kg dry wt	*0.02*		<0.02	<0.02	<0.02	<0.02	<0.02
alpha-BHC	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
Aldrin	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
beta-BHC	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
cis-Chlordane	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
cis-Nonachlor	mg/kg dry wt	*0.01*		<0.01	<0.01	<0.01	<0.01	<0.01
delta-BHC	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
Dieldrin	mg/kg dry wt	*0.05*		<0.05	2.48	<0.05	<0.05	<0.05
Endosulfan I	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
Endosulfan II	mg/kg dry wt	*0.01*		<0.01	<0.01	<0.01	<0.01	<0.01
Endosulfan sulfate	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
Endrin	mg/kg dry wt	*0.05*		<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	mg/kg dry wt	*0.01*		<0.01	<0.01	<0.01	<0.01	<0.01
Endrin ketone	mg/kg dry wt	*0.005*		<0.005	0.009	<0.005	<0.005	<0.005
gamma-BHC	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor epoxide	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
Hexachlorobenzene	mg/kg dry wt	*0.005*		<0.005	<0.005	<0.005	<0.005	<0.005
Methoxychlor	mg/kg dry wt	*0.01*		<0.01	<0.01	<0.01	<0.01	<0.01
trans-nonachlor	mg/kg dry wt	*0.01*		<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	mg/kg dry wt	*0.01*		<0.01	<0.01	<0.01	<0.01	<0.01
Chlordane (sum)	mg/kg dry wt	*0.02*		<0.020	<0.020	<0.020	<0.020	<0.020
TCMX (Surrogate)	%	*1*		86.6	91.2	86.0	83.4	81.9

Total Petroleum Hydrocarbons - Soil

		Client Sample ID	UOH1 0.2
		Date Sampled	1/05/2020
Analyte	Unit	*Reporting Limit*	20-16506-1
C7-C9	mg/kg dry wt	*10*	<10
C10-C14	mg/kg dry wt	*15*	<15
C15-C36	mg/kg dry wt	*25*	134
C7-C36 (Total)	mg/kg dry wt	*50*	134

BTEX in Soil

		Client Sample ID	UOH1 0.2
		Date Sampled	1/05/2020
Analyte	Unit	*Reporting Limit*	20-16506-1
Benzene	mg/kg dry wt	*0.05*	<0.05
Toluene	mg/kg dry wt	*0.05*	<0.05
Ethylbenzene	mg/kg dry wt	*0.05*	<0.05
m,p-xylene	mg/kg dry wt	*0.05*	<0.05
o-xylene	mg/kg dry wt	*0.05*	<0.05
Benzene-d6 (Surrogate)	%	*1*	101.2

Polycyclic Aromatic Hydrocarbons - Soil

			Client Sample ID	UOH1 0.2
			Date Sampled	1/05/2020
Analyte		Unit	*Reporting Limit*	20-16506-1
1-Methylnaphthalene		mg/kg dry wt	*0.01*	<0.01
2-Methylnaphthalene		mg/kg dry wt	*0.01*	<0.01
Acenaphthene		mg/kg dry wt	*0.01*	<0.01
Acenaphthylene		mg/kg dry wt	*0.01*	<0.01
Anthracene		mg/kg dry wt	*0.01*	<0.01
Benz[a]anthracene		mg/kg dry wt	*0.02*	<0.02
Benzo[a]pyrene		mg/kg dry wt	*0.01*	0.01
Benzo[b]&[j] fluoranthene		mg/kg dry wt	*0.02*	0.02
Benzo[g,h,i]perylene		mg/kg dry wt	*0.02*	<0.02
Benzo[k]fluoranthene		mg/kg dry wt	*0.01*	0.02
Chrysene		mg/kg dry wt	*0.01*	0.02
Dibenz(a,h)anthracene		mg/kg dry wt	*0.01*	<0.01
Fluoranthene		mg/kg dry wt	*0.02*	0.03
Fluorene		mg/kg dry wt	*0.01*	<0.01
Indeno(1,2,3-cd)pyrene		mg/kg dry wt	*0.01*	0.02
Naphthalene		mg/kg dry wt	*0.01*	<0.01
Phenanthrene		mg/kg dry wt	*0.01*	0.01
Pyrene		mg/kg dry wt	*0.02*	0.03
Benzo[a]pyrene TEQ (LOR)		mg/kg dry wt	*0.03*	0.03
Benzo[a]pyrene TEQ (Zero)		mg/kg dry wt	*0.01*	0.02
Anthracene-d10 (Surrogate)		%	*1*	88.4

Moisture Content

			Client Sample ID	UOH1 0.2
			Date Sampled	1/05/2020
Analyte		Unit	*Reporting Limit*	20-16506-1
Moisture Content		%	*1*	21

Method Summary

Elements in Soil Samples dried and passed through a 2 mm sieve followed by acid digestion and analysis by ICP-MS. In accordance with in-house procedure based on US EPA method 200.8.

OCP in Soil Samples are extracted with hexane, pre-concetrated then analysed by GC-MSMS. (Chlordane (sum) is calculated from the main actives in technical Chlordane: Chlordane, Nonachlor and Heptachlor). (In accordance with in-house procedure).

Total DDT Sum of DDT, DDD and DDE (4,4' and 2,4 isomers)

TPH in Soil Solvent extraction, silica cleanup, followed by GC-FID analysis. (C7-C36). (In accordance with in-house procedure based on US EPA 8015).

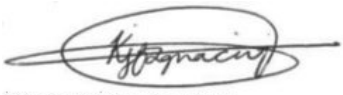
BTEX in Soil Solvent extraction, followed by Headspace GC-MS analysis. US EPA method 5021A.

PAH in Soil Solvent extraction, silica cleanup, followed by GC-MS analysis.
Benzo[a]pyrene TEQ (LOR): The most conservative TEQ estimate, where a result is reported as less than the limit of reporting (LOR) the LOR value is used to calculate the TEQ for that PAH.
Benzo[a]pyrene TEQ (Zero): The least conservative TEQ estimate, PAHs reported as less than the limit of reporting (LOR) are not included in the TEQ calculation.
Benzo[a]pyrene toxic equivalence (TEQ) is calculated according to *'Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health'*. Ministry for the Environment. 2011. (In accordance with in-house procedure).

Method Summary

Moisture Moisture content is determined gravimetrically by drying at 103 °C.

Emily Hanna, B.Sc.
Trace Elements Team Leader

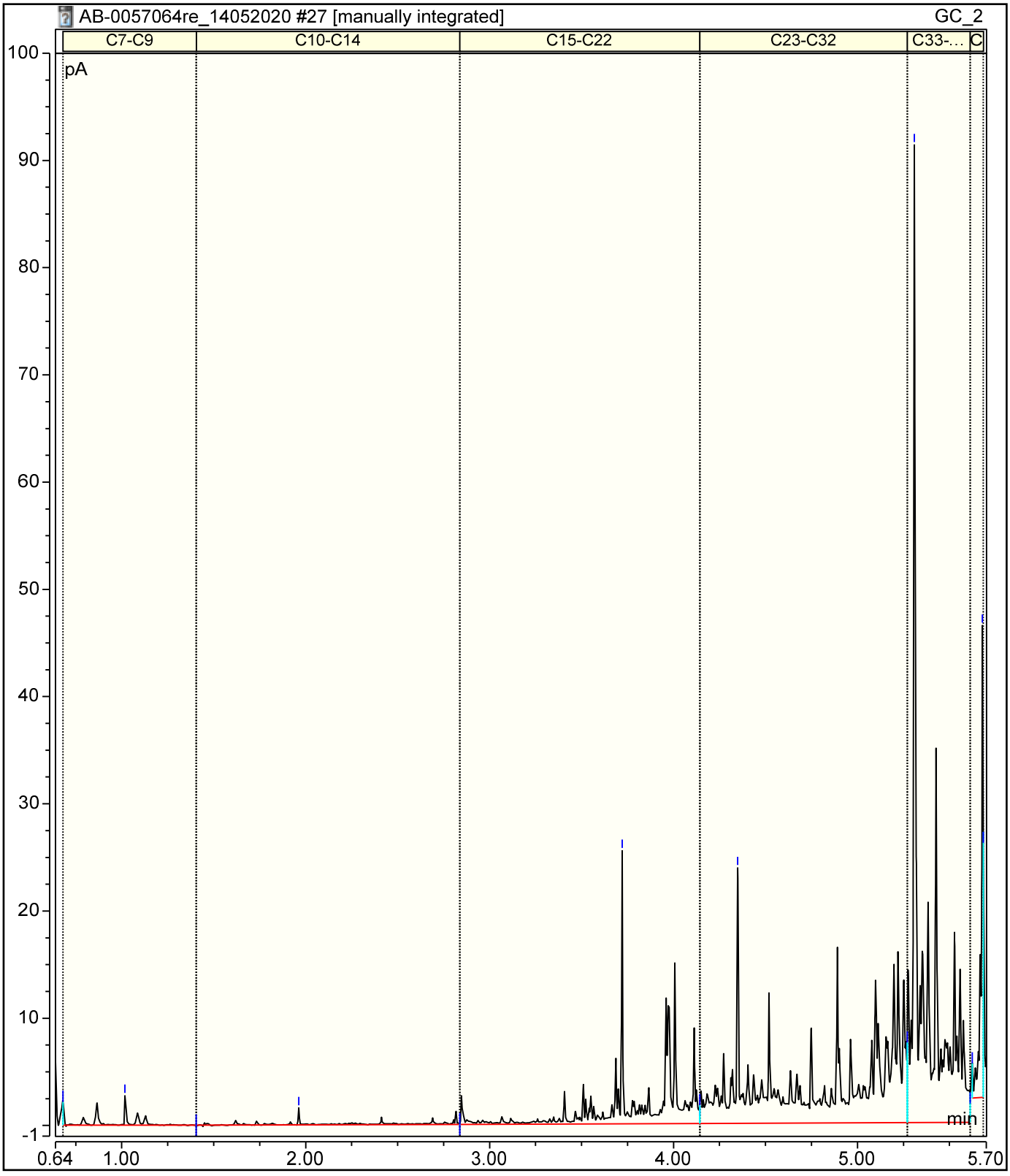


Kimmy Ignacio, B.Sc.
Technician

Rong Zhang
Technician

Chromatogram

20-16506-24



ENVIRONMENTAL TESTING:

CHAIN OF CUSTODY

20-16506

HOLD/COLD

ANALYTICA LABORATORIES

CLIENT INFORMATION	
Client	WSP
Address	69 Tarbert St Alexandra
Project Leader	M. Baddiley
Project ID	UoH
Site	Hakatekura
Sampler	MB
Phone	021 233 6761
Email	megan.baddiley@wsp.com
Invoice Email	

Lab ID (Lab use only): 20-16506 | Registered By: Ginny | Date Registered: 8/5/20.

Customer Comments/Instructions

Scheduling to be sent seperately via email.

Samples transferred to: Date: LR 7.5.20 Initials:

- Auckland
- Hamilton ✓
- Wellington
- Christchurch
- Dunedin

CLIENT REQUESTS (Please Tick)

Routine	✓	Priority		Urgent		ESDAT		QC Report		Drinking Water	

	Sample ID	Depth	Sampling Date	Time	Matrix (Please Circle)	Analysis Requests/Suites [Enter Test Code Below]	Sample Comments (ie: extra test requests, high odour, bulk material)
1	UoH 1	0.2	1/5/20		(S) CW - SW - WW		
2	UoH 1_Dup		"		(S) CW - SW - WW		
3	UoH 2	0.2	"		(S) CW - SW - WW		
4	UoH 3	0.2	"		(S) CW - SW - WW		
5	UoH 4	0.2	"		(S) CW - SW - WW		1x Asb Sample
6	UoH 5	0.2	"		(S) CW - SW - WW		
7	UoH 6	0.2	"		(S) CW - SW - WW		
8	UoH 7	0.2	"		(S) CW - SW - WW		
9	UoH 7	0.5	"		(S) CW - SW - WW		
10	UoH 8	0.2	"		(S) CW - SW - WW		1x Asb Sample
11	UoH 9	0.2	"		(S) CW - SW - WW		
12	UoH 10	0.2	"		(S) CW - SW - WW		

Taken outside dunedin lab

Matrix Key	S (Solids)	CW (Clean Water)	SW (Saline Water)	WW (Waste Water)
	All soils, sediment, sludge	Potable, Ground, Bore, Surface, Fresh	Sea Water, Geothermal	Effluent, Trade Waste, Leachate

Sender Name	L. Bond	Received by (Lab Staff)	KW	Courier company	NZ	Courier #	8WG0011164
Date Sent	4/5/20	Time sent	am : pm	Date Received	8/5/20	Time Received	7.27 am : pm

Seal Status: ✓ | Sample Chilled: ✓

Analytica Laboratories Ltd
Ruakura Research Centre
10 Bisley Road, Private Bag 3123
Hamilton 3240, New Zealand
Phone +64 7 974 4740
Email enviro.reception@analytica.co.nz
analytica.co.nz

ENVIRONMENTAL TESTING:

CHAIN OF CUSTODY

PAGE 2

ANALYTICA LABORATORIES

CLIENT INFORMATION	
Client	WSP
Address	69 Tarbet St Alexandra
Project Leader	M Baddiley
Project ID	UOH
Site	Hakitekura
Sampler	MB
Phone	021 233 6761
Email	megan.baddiley@wsp.com
Invoice Email	

Lab ID (Lab use only)		Registered By		Date Registered	

Customer Comments/Instructions

Samples transferred to: Date: 7.5.20 Initials: LR

Auckland
Hamilton ✓
Wellington
Christchurch
Dunedin

CLIENT REQUESTS (Please Tick)											
Routine	✓	Priority		Urgent		ESDAT		QC Report		Drinking Water	

	Sample ID	Depth	Sampling Date	Time	Matrix (Please Circle)	Analysis Requests/Suites [Enter Test Code Below]										Sample Comments (ie: extra test requests, high odour, bulk material)
1	UOH 11	0.2	1/5/20		(S) - CW - SW - WW											
2	UOH 12	0.2	"		(S) - CW - SW - WW											
3	UOH 13	0.2	"		(S) - CW - SW - WW											
4	UOH 14	0.2	"		(S) - CW - SW - WW											
5	UOH 15	0.2	"		(S) - CW - SW - WW											1x Asb Sample
6	UOH 16	0.2	"		(S) - CW - SW - WW											
7	UOH 17	0.2	"		(S) - CW - SW - WW											1x Asb Sample
8	UOH 18	0.2	"		(S) - CW - SW - WW											
9	UOH 20	0.2	"		(S) - CW - SW - WW											
10	UOH 21	0.2	"		(S) - CW - SW - WW											
11	UOH 22	0.2	"		(S) - CW - SW - WW											
12	UOH 23	0.2	"		(S) - CW - SW - WW											

Taken back to the dunedin lab.

Matrix Key	S (Solids)	CW (Clean Water)	SW (Saline Water)	WW (Waste Water)
	All soils, sediment, sludge	Potable, Ground, Bore, Surface, Fresh	Sea Water, Geothermal	Effluent, Trade Waste, Leachate

Sender Name		Received by (Lab Staff)	KW	Courier company	NZC	Courier #	8WC 000 1164

Date Sent		Time sent	am : pm	Date Received	8/5/20	Time Received	am 7:27 pm	Seal Status	✓	Sample Chilled	✓

Analytica Laboratories Ltd
Ruakura Research Centre
10 Bisley Road, Private Bag 3123
Hamilton 3240, New Zealand
Phone +64 7 974 4740
Email enviro.reception@analytica.co.nz
analytica.co.nz

wsp.com/nz

APPENDIX 5:

Integrated Transportation Assessment

Tim Kelly Transportation Planning Ltd, May 2020

tim kelly transportation planning limited

mahana nelson
027-284-0332
tim@tktpl.co.nz
www.tktpl.co.nz

Proposed Hākitekura, Woolshed Bay
Queenstown
Integrated Transportation Assessment

prepared by: **Tim Kelly Transportation Planning Ltd**

for: **University of Otago**

May 2020

Reference: hakitekura ita v4 may20.docx

Contents

1 Background & Scope

1.1 Background

In 2016, the University of Otago's Foundation Trust was gifted a 4Ha property (Lots 1 and 3 DP452315) by the Jardine family. The property is located in Woolshed Bay, a southwest facing inlet on the shores of Lake Wakatipu.

The University intends to develop the property as an academic retreat and conference facility, Hākitekura, for which a land-use consent is required from the Queenstown Lakes District Council (**QLDC**).

This, in turn, requires an assessment of the effects of the proposal upon the operation of the transportation network in this area.

1.2 Scope

A request for an Integrated Transportation Assessment (**ITA**) was made by QLDC at a meeting held in March 2019.

The purpose of the ITA is to assess the proposed operation of the facility in terms of traffic generation, parking, servicing and disability / pedestrian / cycle / public transport accessibility. This includes an assessment against the relevant provisions of the district plan and the potential for any effects associated with any areas of non-compliance.

This document forms part of an Assessment of Environment Effects (**AEE**), which in turn supports an application for resource consent for the Hākitekura development to be lodged with QLDC.

2 Existing & Future Situation

2.1 Location

The location of the Hākitekura application site is shown by **Figure 2.1.**

This is located to the south of the Jacks Point residential area and approximately 11kms from the Frankton commercial area and Queenstown Airport.

2.2 Road Environment

Vehicle movements between Hākitekura and State Highway 6 (**SH6**) will utilise Maori Jack Road and Woolshed Road.

Maori Jack Road

Maori Jack Road provides vehicular access to the Jacks Point and Homestead Bay areas. This is a privately owned and maintained two-lane road with a carriageway 7 – 8m wide with mostly grassed verges and a footpath for part of its length (**Photos 2.1 and 2.2**). The sign-posted speed limit is 40 km/hr.

Photo 2.1: Maori Jack Road, close to SH6 intersection (Source: Google Streetview)

Photo 2.2: Maori Jack Road, N of Woolshed Rd intersection (Source: dashcam)

The intersection of Maori Jack Road with SH6 is priority controlled, with movements from Maori Jack Road required to give-way. A 90m deceleration lane is provided for vehicles turning left into Maori Jack Road from the south. Localised widening provides for a 16m ancillary lane for vehicles turning right into Maori Jack Road from the north (**Photos 2.3 and 2.4**).

Woolshed Road

Woolshed Road connects Maori Jack Road with the application site. This has an unsealed single carriageway 3.5 – 5m wide with grassed shoulders which enable passing as needed at lower speeds (**Photos 2.5 – 2.8**).

The Maori Jack Road / Woolshed Road intersection is uncontrolled but with priority to movements on Maori Jack Road. Sightlines for turning vehicle movements are appropriate for the low speed environment in this area.

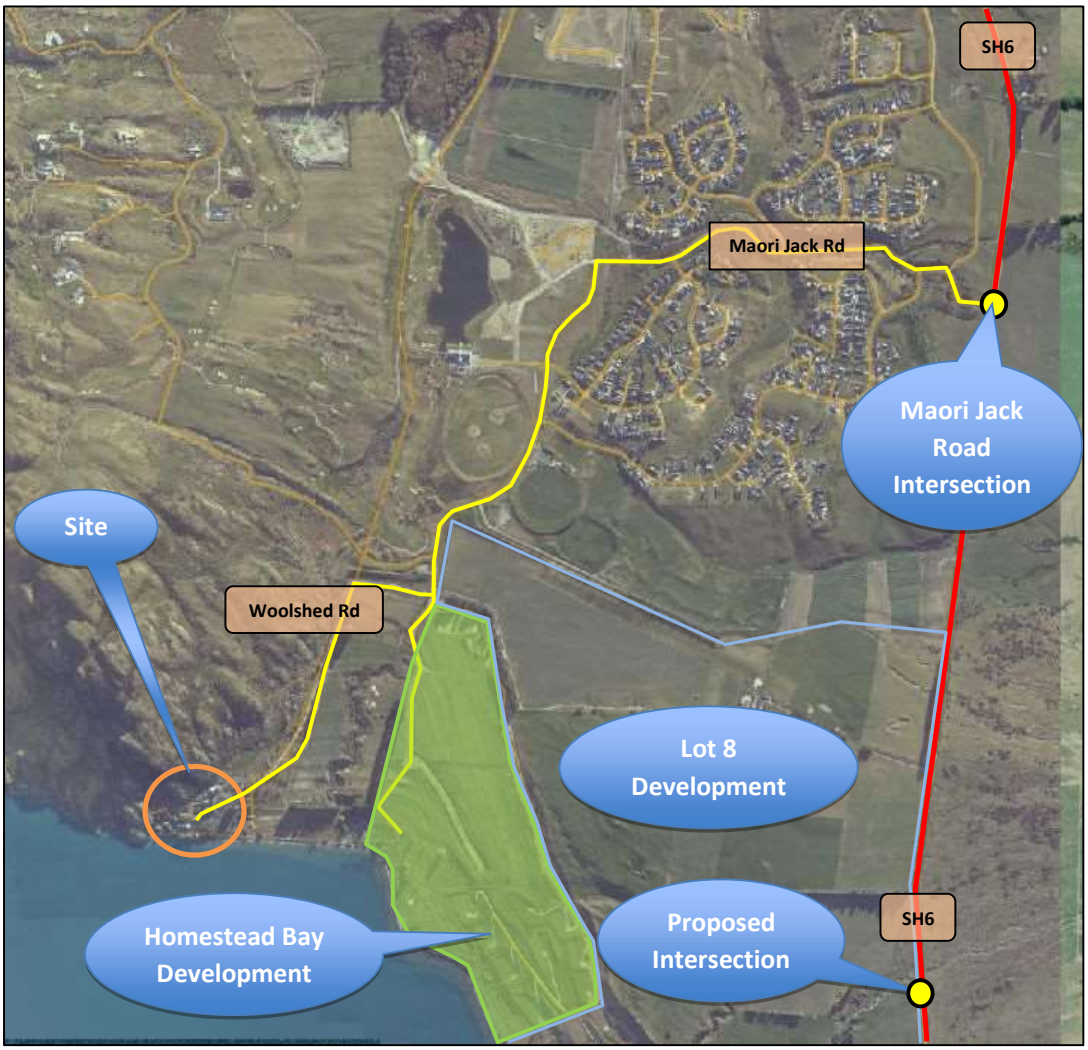


Figure 2.1: Location Plan *(Source: QLDC Aerials)*

Photo 2.3: SH6 South approach to Maori Jack Road intersection (Source: Streetview)

Photo 2.4: SH6 North approach to Maori Jack Road intersection (Source: Streetview)

Photo 2.5: View to W of Woolshed Road from Maori Jack Road (Source: Photo)

Photo 2.6: View to W along Woolshed Road from close to Maori Jack Road (Source: Photo)

Photo 2.7: View to E along Woolshed Road towards Maori Jack Road (Source: Photo)

Photo 2.8: View to SW along Woolshed Road access (Source: Photo)

2.3 Traffic Volumes

State Highway 6

Information from the NZ Transport Agency (**NZTA**) indicates that in 2018, SH6 carried typical daily traffic volumes of 3,510 vehicles/day (8.4% heavy vehicles) to the south of

Jacks Point and 7,260 vehicles/day (6.7% heavy vehicles) to the south of the Remarkables ski-field access.

These volumes are subject to significant seasonal variability, with higher volumes during the summer months and the ski-season.

Annual traffic volume figures for the period since 2011 indicate that while volumes to the south of the Remarkables ski-field access have grown by 154%, those to the south of Jacks Point have grown by only 69%. The difference is attributable to development of the Jacks Point area, growing from 770 vehicles/day in 2011 to 3,750 vehicles/day in 2018.

These volumes will be impacted by the COVID-19 crisis, particularly as tourist-related activity and traffic movements may take some time to return to levels seen prior to the crisis.

Maori Jack Road

As a privately-operated road, no information is available from QLDC regarding current levels of traffic activity on Maori Jack Road. From the available SH6 count information, it can be inferred that the eastern section of Maori Jack Road typically carries 3 – 4,000 vehicles/day. This is consistent with turning counts undertaken in February 2020[1], which identified weekday peak-hour volumes of 380 – 450 vehicles/hour.

Woolshed Road

Current volumes using Woolshed Road are unknown but, based on the number of activities within the catchment area, will be very low.

Congestion is not an issue in this area, with delays and queuing at the SH6 / Maori Jack Road intersection being minimal and of short duration.

2.4 Crash History

The crash history for the existing roads in this area for the period since January 2015 has been obtained from the database maintained by the NZTA and is summarised by **Figure 2.2.**

Three incidents have occurred at the SH6 / Maori Jack Road intersection:

- April 2017: a vehicle turned right from Maori Jack Road into the northbound lane and collided head-on with a northbound vehicle (one serious and one minor casualty);
- November 2017: a southbound truck swung to the right in order to make a tight turn into a gateway opposite Maori Jack Road. A car which slowed behind the truck was rear-ended by a bus which failed to stop (no casualties); and
- April 2018: a southbound car turning right into Maori Jack Road failed to negotiate the turn and collided with a wall (no casualties).

[1] Surveys were undertaken on 10 February 2020.

Other incidents along this section of SH6 have been associated with a variety of factors, principally collisions with animals, loss-of-control and rear-end collisions with other vehicles which have slowed or stopped.

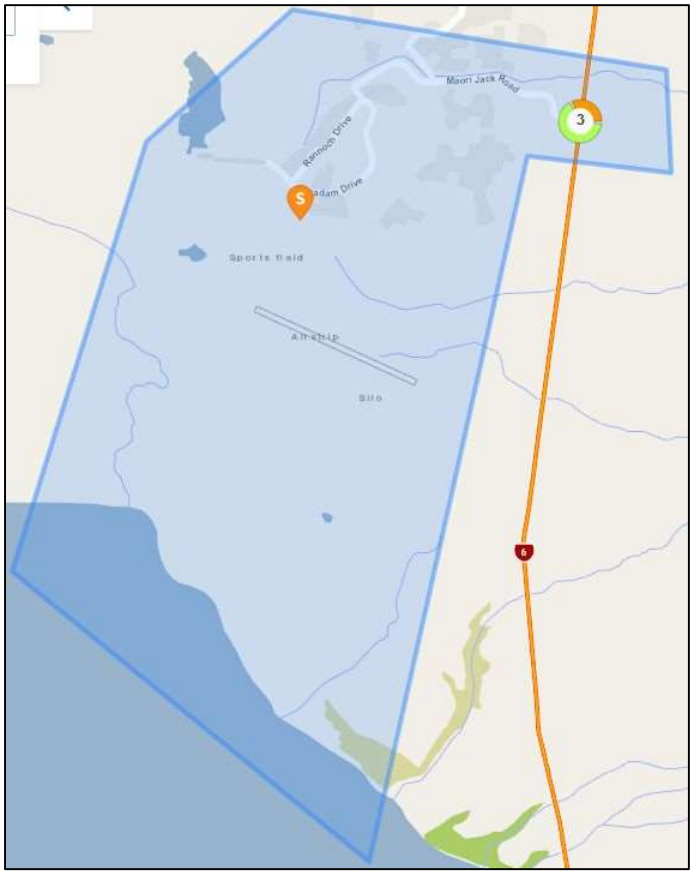


Figure 2.2: Crash Summary
(Source: NZTA)

No incidents have been reported on Maori Jack Road. One incident has occurred on Jacks Point Rise (a residential road connecting two parts of Maori Jack Road). This occurred in April 2019 and involved a child which ran in front of a car, sustaining a serious injury.

This record of recent crashes does not indicate any systemic safety problems.

By law, only those crashes involving personal injuries are required to be reported. Accordingly, it is possible that a number of other non-injury crashes may have occurred which have not been included in these records.

2.5 Walking, Cycling and Public Transport

While a number of off-road pedestrian and cycle routes exist within Jacks Point, none of these connect directly to the application site area (though this may change as general development proceeds).

The #4 Lakes Hayes – Jack Point bus service operates at 30-minute intervals and provides connectivity to the Queenstown urban area by means of the Frankton bus interchange. The closest stop, the Jacks Point terminus, is approximately 1.9 kms from the application site. With on-going development in this area, this bus service may be extended in the future.

2.6 Current & Permitted Development

Significant development is occurring and/or planned in the immediate and wider areas, which will impact upon the operation of the transportation network.

Jacks Point

To the north, the total residential yield of the Jacks Point area is understood to be 1,100 dwellings (excluding the Homestead Bay area).[2] The Jacks Point village is currently under construction and will provide a range of retail and service facilities. Vehicular access between Jacks Point and SH6 is by means of Maori Jack Road.

Hanleys Farm

Further north again, the Hanleys Farm area is expected to have a total yield of 1,500 dwellings and will include a primary school (now understood to be a committed project[3]). Vehicular access between Hanleys Farm and SH6 is by means of Jack Hanley Drive.

Homestead Bay

The Homestead Bay area lies to the SE of the application site, as shown by **Figure 2.1**. The Operative District Plan (**ODP**) provides for development of up to 760 dwellings within the Homestead Bay Village area, with an additional 12 dwellings within the Open Space Residential (**OSR**) Stage 1 area.

A change in zoning is currently sought which would enable an intensification of development within the Homestead Bay area, providing for an additional 267 dwellings.[4]

Proposals for Homestead Bay include lifestyle blocks, apartments, a village centre and a marina.

Vehicular access between the Homestead Bay area will be by means of Maori Jack Road. The construction of a new intersection on SH6 to service Lot 8 (described below and shown by **Figure 2.1**) would provide a secondary route for some vehicle movements.

Lot 8

Lot 8 is located to the east of Homestead Bay. Currently zoned 'rural', the permissible activities on this land and associated traffic activity are limited. A sky-diving business operates from an airstrip and the balance of the land is farmed as part of Remarkables Station.

A proposal to rezone Lot 8 from 'rural' to 'Jacks Point' zone seeks to enable the construction of 476 dwellings[5]. These would be serviced by a new intersection to be constructed on SH6, shown by **Figure 2.1**.

[2] Based upon Water Supply Demands table prepared by Clark Fortune McDonald & Associates, 25 January 2019.
[3] Advice received from Dan Wells, 4 June 2019.
[4] Currently subject to Appeal.
[5] Currently subject to Appeal.

2.7 Planned Changes to Transportation Network

As described above and subject to the resolution of appeals, a new intersection will be constructed on SH6 to service the Lot 8 development area. This will be a roundabout and will be located slightly over 2kms south of the existing Maori Jack Road intersection.

The operation of a ferry service connecting Homestead Bay with Queenstown is currently being investigated. Such a service would potentially reduce the demand for vehicular travel between these areas. This will be within walking distance of the Hākitekura site.

As development progresses in this area, it is likely that the existing bus service within Jacks Point will be extended south to include Homestead Bay. If and when this occurs, this would be likely to bring the bus service within walking distance of the Hākitekura site.

2.8 Existing Activity

The eastern portion of the site is generally flat and contains a number of existing buildings. The western portion of the site is a largely undeveloped rocky hillside.

The site contains several existing buildings including the converted Woolshed, the Shearers Quarters and consequential farming structures such as dog kennels. Both the Woolshed and Shearers Quarters are residential dwellings, and although the Shearers Quarters are still occupied, the Woolshed has been vacant since early 2020. The Shearers Quarters are located in the southernmost portion of Lot 1, at the base of the hill. The Woolshed is located to the east of the Shearers Quarters, and has been extensively modified from its original form, both internally and externally.

The site surrounding the existing buildings is covered with extensive gardens and landscaping elements.

Levels of traffic activity associated with the existing use of the site are unknown but likely to be very low.

In addition to the site, Woolshed Road provides access to two residential dwellings.

3 The Proposal

3.1 Concept

The general proposal is for the development of an academic retreat and conference centre, Hākitekura.

While the primary purpose of the proposed facility is for educational and academic purposes (i.e., small-scale retreats and conferences), the use of the facility by other parties, when it is available, is also proposed by the University. This secondary commercial use could include third party events such as weddings and/or use of the site's visitor accommodation. This secondary use will only be available by prior arrangement directly with the University. Access into the site by the general public will not be provided for.

3.2 Components

The main components of the development will be:

- demolition of the existing shearers quarters;
- redevelopment of the existing woolshed building;
- construction of a new Hākitekura lecture theatre wing;
- construction of 16 visitor accommodation units; and
- construction of a residential unit for site staff.

The new Hākitekura wing will adjoin the redeveloped Woolshed building. Together, these will provide the following facilities:

- a lecture theatre (initially with seating capacity for 60 people, to be increased to 120 in the future);
- a lounge;
- a meeting room / library;
- a multi-faith room;
- a full commercial kitchen and restaurant;
- a gallery;
- a conservatory;
- offices (upper level); and
- ancillary storage, laundry, toilet facilities etc.

Accommodation will be provided in the form of 16 lakeside rooms. As indicated above, this accommodation will only be available by prior arrangement with the University and will not be available to the general public.

A separate staff accommodation house (having three double bedrooms) will be provided.

3.3 Vehicular Access

Vehicular access to the site will be broadly unchanged with the use of Woolshed Road from the Maori Jack Road intersection. As described in **Section 2**, the width of this road is not sufficient for full two-way movement but with vehicles able to pass at reduced speed and with some use of the grassed verges.

The increase in traffic activity will be associated with the proposed facility will result in an increased frequency of vehicles needing to pass. This will be addressed by the provision of passing facilities as shown by **Figure 3.1**:

- widening the first 10m from the Maori Jack Road intersection to 5.5m;
- providing passing places broadly at 200-250m intervals, where the total available width will be a minimum of 5.5m and length 10m; and
- ensure a minimum 3.5m trafficable width is available throughout.

It is stressed that at this stage, these are indicative proposals only. Passing locations will be fully assessed during the detailed design phase and confirmed through the Engineering Acceptance process.

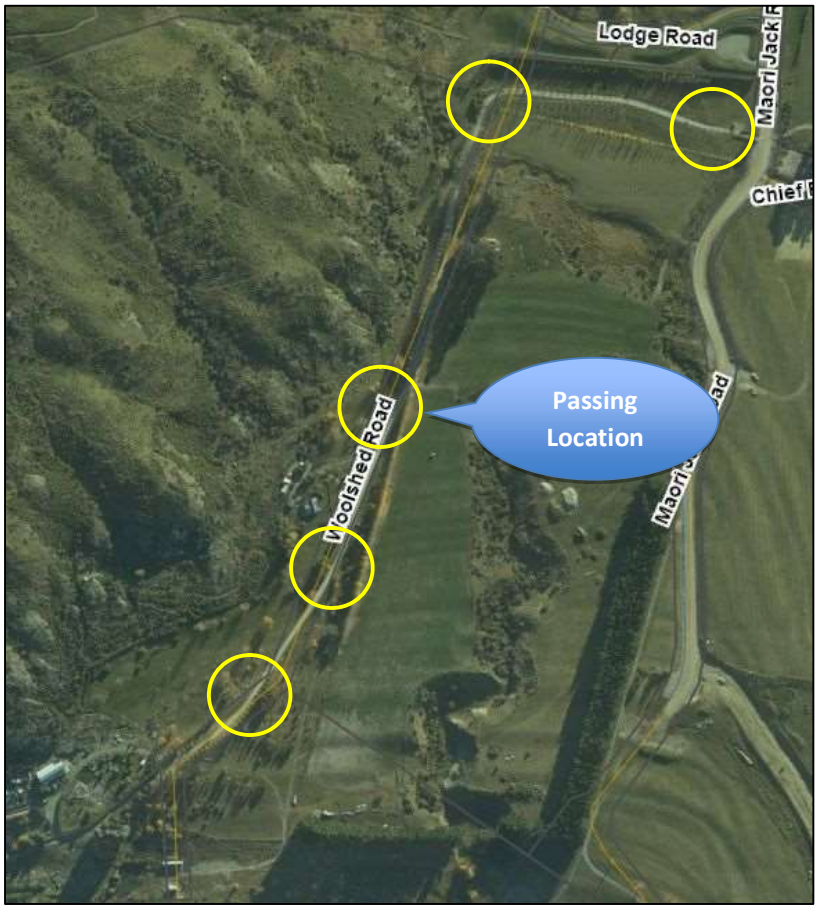


Figure 3.1: Woolshed Road - Indicative Passing Locations

The University proposes that a minivan will be provided as part of the facility, with the purpose of picking up or dropping off attendees.

Within the site, a manoeuvring area will be provided adjacent to the Woolshed building to enable minivans / taxis to turn around when dropping off or collecting passengers. This will also enable service vehicles to turn around.

3.4 Parking

Vehicle Parking

The general approach to parking provision has been to ensure sufficient spaces are available to meet the typical demands likely to be generated by the facility, with areas also identified for overflow parking, to be used if and when required.

A total of 22 formed spaces will be provided for vehicle parking, distributed around the complex;

- two spaces reserved for staff use adjacent to the lecture theatre;
- four spaces (of which two will be mobility spaces) adjacent to the woolshed building;
- eight spaces on the northern side of the access road (two will provide charging facilities for electric vehicles);
- two spaces within garaging (one for the minivan, the other for staff use), accessed from northern side of driveway; and
- six spaces adjacent to the accommodation units (of which one will be a mobility space).

Further space to accommodate any occasional overflow parking is also available on a grassed area adjacent to the accommodation units.

Cycle Parking

Cycles will be available for use by visitors / residents. A cycle storage area adjacent to the lecture theatre will have a capacity of at least 16 cycles (but this capacity will be able to be readily increased if the demand exists for additional cycle use).

3.5 Pedestrian Connectivity

The activity is not expected to generate any significant external pedestrian activity, other than for recreational purposes by attendees.

Within the site, pedestrian activity will take place between parking areas, the accommodation units and the main complex. An off-road footpath will connect the staff accommodation units with the woolshed building. Elsewhere, pedestrian can use grassed areas or the driveways, which will operate as ‘shared spaces’ with very low levels of traffic activity and speeds.

3.6 Disability Accessibility

As described above, parking spaces will be reserved for those with disabilities. Two spaces will be located adjacent to the main complex with a third space in the parking area servicing the accommodation units.

These spaces will be sized to accommodate disability requirements and will have appropriate wheel-chair access to the adjoining facilities.

3.7 Development Programme & Staging

No specific programme has yet been developed for the construction process.

As described above, the lecture theatre will be designed with an initial capacity of 60 people, with an ability to be increased to 120 in the longer term.

3.8 Servicing

The complex will have minimal servicing requirements, associated primarily with refuse / recycling collection and the delivery of catering supplies. Deliveries will take place in the courtyard adjacent to the woolshed, with a sufficient manoeuvring area to enable an 8m vehicle to turn around. Refuse/recycling vehicles will also be able to turn around at this point, or utilising the driveway providing access to the minivan garaging area.

3.9 External Measures

Aside from the modifications to Woolshed Road described above, no further measures are required beyond the site boundary.

3.10 Third Party Use

As described above, the facilities may occasionally be used by third parties, for events such as weddings, conferences and high-school functions.

As such events have a potential to be associated with higher rates of vehicle use and parking demands, it is proposed that the grassed area adjacent to the visitor accommodation parking would be available, if needed, for use as additional parking. Also, the minivan will be available for use for the transportation of groups to the venue from Queenstown, the airport, or elsewhere.

4 Assessment of Effects

4.1 Scope of Potential Effects

The potential effects associated with the Hākitekura may be summarised as:

- additional vehicular activity – effects upon safety / efficiency of external road network and Woolshed Road access;
- parking – adequacy of proposed parking provision relative to likely demand;
- servicing – ability for service vehicles to access and manoeuvre within the site;
- pedestrian / cycle activity – safety of movements within and beyond the site;
- disabled visitors – provision (parking, internal access); and
- construction.

4.2 Assessed Scenario

Facilities of this type are characterised by lengthy periods of low usage with occasional periods of high usage.

This assessment has been based on a high usage period but recognising that this represents an intentionally 'worst-case' scenario, as levels of traffic activity and parking demand will, for most periods, be significantly lower.

University Use

The capacity of the lecture theatre will govern the maximum number of people expected to be on the site at any time. In the longer term, this will provide for 120 people. Some of these people would stay overnight on the site, utilising the accommodation units – the occupants will not be additional to the attendees of events at the lecture theatre.

In addition, there may be up to five staff on the site, associated with catering, administration or cleaning.

The relatively remote location of the site means that some attendees will arrive in the Queenstown area by air, transferring to minivans, shuttle-buses, taxis or shared rental cars at the airport. Others will arrive in shared vehicles, including the use of minivans by larger groups.

For assessment purposes, the following split of travel has been assumed:

- 25% (30 people) arrive by taxi or shuttle-van that drops off but does not require parking on-site (assume 3 persons/vehicle) = 10 arrivals and departures;
- 50% (60 people) arrive by minivan (assume 10 persons/vehicle) = 6 arrivals and departures – as a number of trips will be made by the same vehicle, assume only two minivans require on-site parking (one of which will be the University-operated minivan with its own reserved garage parking);
- 25% (30 people) arrive by private/rental car @ 2 persons/vehicle = 15 cars, which require parking; and

- staff: one member of staff already resident on the site (with a vehicle parked in a garage), 80% (4 staff) arrive by private car @ 1 person/vehicle = 4 cars, which require parking.

In addition, within the course of a day, there may be two arrivals and departures associated with service vehicles.

Based on these assumptions and allowing for some possible additional travel by attendees within a day, the total number of vehicle arrivals would be at most 50 per day, with the same number of departures. The timing of these vehicle movements would be governed by any events to be held but few would be expected to occur during the busiest weekday morning and evening peak periods.

Third Party Use

As described in **Section 3**, third party use may include events such as weddings, conferences and high-school functions. Such events are likely to involve some use of the University or other minivans for group travel with a likely scenario being:

- 100 guests;
- 30% (30) arrive and depart in minivans (10 people/van);
- 70% (70) arrive and depart in private cars (3 people / vehicle);
- 4 staff arrive and depart individually in private vehicles; and
- 2 catering vehicles arrive and depart.

This would result in 30 – 35 vehicle arrivals and departures. Compared to the University use, this is likely to be more 'peaked' around event start / finish times but also more 'tidal', with vehicle movements being predominantly in the same direction (inbound or outbound) at the same times.

4.3 Additional Vehicular Activity

The volumes described above can be easily accommodated by the section of Woolshed Road between Maori Jack Road and the site, subject to the provision of passing bays as described in **Section 3**.

Traffic volumes increases on Maori Jack Road and at the SH6 intersection, especially during the weekday peak periods, would be very small and likely to be within the day-to-day variability in these volumes. As a consequence, there would be no tangible impacts upon the operating efficiency of Maori Jack Road, the SH6 intersection, or SH6 between Maori Jack Road and Frankton.

4.4 Parking: Supply and Demand

As described in **Section 3**, the site will provide a total of 22 parking spaces.

Parking demands associated with the 'University' scenario described above would be at most 22 spaces.

For the occasional 'Third Party' scenario, the parking demand would be at most 30 vehicles (assuming the catering vehicles were only delivering or parked in the service area). This demand would be accommodated by the use of the overspill parking area described in **Section 3.4**. In the unlikely event that this was to become a regular occurrence, this could be permanently converted to an additional area of parking.

This means that the site will be self-sufficient with respect to parking provision, with no possibility that any demands for vehicle parking will be generated beyond the confines of the site.

All on-site parking will meet the geometric requirements of standard AS/NZ2890.1:2004[6], ensuring their safety and convenience of use.

4.5 Servicing

The site will be serviced by refuse/recycling vehicles with occasional catering deliveries. The maximum size vehicle used for these purposes will be an 8m truck, for which turning areas are available adjacent to the woolshed and utilising the driveway to the minivan parking area.

4.6 Pedestrian and Cycle Safety

As described in **Section 3.5**, the site will offer a high degree of pedestrian accessibility, including the 'shared space' environment on the driveways. Low levels of vehicular activity and speeds mean that pedestrian safety will be ensured.

Cycling is expected to be principally for recreational purposes, including utilisation of Woolshed Road / Maori Jack Road to facilities in the Jacks Point area. These roads are lightly trafficked with good sightlines and low traffic speeds, allowing cycle movements to be safely accommodated.

The site will be permeable by pedestrians, with grassed areas between each of the main buildings and a footpath between the Woolshed and the visitor accommodation block. The driveways will also operate in a 'shared space' environment, with very low levels of traffic activity and speeds – as such, they will also provide convenient and safe routes for use by pedestrians.

4.7 Disability Provision

The arrangements for disability parking described in **Section 3** will ensure that visitors or staff having disabilities can access the site and facilities both efficiently and safely.

4.8 Construction Traffic

The demolition and construction phases of the project will result in some additional vehicular movements in this area, especially trucks. At this stage, the number of construction vehicle movements is unknown.

[6] Parking Facilities. Part 1: Off-Street Car Parking. Standard AS/NZS 2890.1: 2004. *Standards New Zealand, 2004.*

It is recommended that the provision of passing places along Woolshed Road precedes the initiation of construction activity – this will ensure that any inconvenience experienced by other users of the road will be kept to a minimum.

5 District Plan Provisions & Compliance

5.1 Relevant District Plan

The Operative District Plan (**ODP**) is the Queenstown Lakes District Plan. This is currently the subject of a review process, with decisions on the Proposed District Plan (**PDP**) having been notified, subject to submissions and the resolution of a number of appeals. Accordingly, the PDP carries significant 'weight'.

The sections which follow assess the proposal against the relevant district-wide transport rules and standards for both the ODP and the PDP.

5.2 Operative District Plan: Compliance with Standards

An assessment of the proposal against the relevant ODP district-wide standards is presented at **Table 5.1**.

Under the road hierarchy defined at Appendix 6 of the ODP, SH6 is classified as an 'Arterial Road', with Maori Jack Road and Woolshed Road classified as 'Local Roads'.

The application site is located within the 'Resorts' zone.

The only transportation matter triggering the need to seek a land use consent is related to parking. The proposed academic retreat and conference facility is a type of activity not specifically identified in the minimum parking requirements table, and on this basis land use consent is required for 'car parking for non-identified activities' (Rule 14.2.2.3(i)). While no minimum parking requirements apply to the proposal, it is noted that the University is not permitting visitation by coaches and therefore specific parking areas for coaches is unnecessary and no adverse effects would arise.

5.3 Proposed District Plan: Compliance with Rules and Standards

An assessment of the proposal against the relevant PDP district-wide rules and standards is presented at **Table 5.2**.

Under the road hierarchy defined at Schedule 29.1 of the PDP, SH6 is classified as a 'State Highway', with Maori Jack Road and Woolshed Road classified as 'Local Roads'.

The application site is located within the 'Jacks Point' Zone.

The only transportation matter triggering the need to seek a land use consent is related to parking. The proposed academic retreat and conference facility is a type of activity not specifically identified in the minimum parking requirements table, and on this basis land use consent is required for 'car parking for non-identified activities' (Rule 29.4.12). While no minimum parking requirements apply to the proposal, it is noted that the University is not permitting visitation by coaches and therefore specific parking areas for coaches is unnecessary and no adverse effects would arise.

5.4 QLDC Land Development and Subdivision Code of Practice (Code)

The roading requirements of the Code are based upon standard NZS4404:2010[7] which requires a rural road within a 'live and play' environment to provide for one-way traffic movement but with passing bays up to every 50m. As described in **Section 3.3**, provision for passing is proposed at 200-250m intervals. With good forward sightlines and low traffic volumes, this will provide for an adequate level of service for road users in this area.

[7] New Zealand Standard 4404:2010: Land Development and Subdivision Infrastructure. Standards NZ, 2010.

TABLE 5.1: COMPLIANCE WITH DISTRICT WIDE TRANSPORTATION STANDARDS (OPERATIVE DISTRICT PLAN) Section 14 - Transport		
Requirement	**Interpretation & Compliance**	**Comment**
Section 14.2.4 – Site Standards / 14.2.4.1 – Parking and Loading		
i Minimum Parking Space Numbers Activities shall provide on-site parking space in accordance with Table 1 … ***Residential units*** - All Other Zones … - Residents / visitor - 2 per unit. ***Visitor Accommodation (guest room type construction, e.g., hotels)*** - Residents / visitor – 1 per 3 guest rooms up to 60 guest rooms, plus Staff/ guest – 1 per 20 beds. ***Convention Centre*** - Residents / visitor - 1 car park per 10 persons or 1 car park per 10 m^2 of public floor area, whichever is greater. In addition, one coach park per 50 people the site is designed to accommodate. ***Meeting Place and Entertainment Facilities*** – Residents / visitor – 1 car park per 10m^2 public floor area or 10 seats (whichever is greater).	The University's proposal is a type of activity that is not specifically identified in Table 1 of this standard and therefore, Rule 14.2.2.3(i) above triggers the need to seek a land use consent in relation to the proposed provision of parking at the site (i.e., 22 parking spaces). However, to provide some form of context, the parking requirements for residential units, visitor accommodation as well as meeting places and entertainment facilities and / or a convention centre have been used to identify potential minimum parking requirements. The parking requirements for each of these activities under this standard are: **Residential unit:** 2 car parks for the staff house. One of these parks is provided in the proposed garage. **Visitor accommodation:** 7 car parks for the proposed garden rooms. This includes 1 staff car park. **The Woolshed and Hākitekura lecture theatre:** If assessed as a meeting place and entertainment facility[8], 12 car parks if the number of seats is used to calculate minimum parking requirements, and 109 car parks would be required if the total public floor area (1,083m^2) of these two buildings was used. If assessed as a convention centre[9], 3 coach parks and between 12 to 109 car parks would be required. Based on the above calculations, between 21 to 118 car parks could be required at the site, as well up to 3	This assessment has demonstrated that the proposed facility will be self-sufficient with regard to parking provision, with no possibility of adverse effects in terms of overspill parking to areas beyond the site. There is no intention for full sized buses/coaches to service the facility – a requirement to provide parking spaces for buses/coaches would result in unsightly areas of unused parking. The application of the PFA would result in an unrealistically high requirement because this would not recognise the manner in which travel will be undertaken to and from the site.

[8] The ODP defines 'Place of Assembly' as – *"any land or building used for public and private assembly primarily for worship, recreation, education and discussion and includes churches, church halls, sports clubrooms, pavilions, indoor sports facilities and community centres whether such building has a general ancillary licence or not. It does not include any place of entertainment or licensed premises, other than general ancillary licensed premises."*

[9] The ODP defines 'convention centre' as – *"building(s) and their use for functions and may include auditorium(s), concert hall(s), lecture hall(s), meeting room(s), conference room(s), banquet room(s), exhibition space(s) and ancillary services. For the purpose of this definition, convention centres do not include visitor accommodation."*

TABLE 5.1: COMPLIANCE WITH DISTRICT WIDE TRANSPORTATION STANDARDS (OPERATIVE DISTRICT PLAN) Section 14 - Transport		
Requirement	**Interpretation & Compliance**	**Comment**
	coach parks if the 'convention centre' activity was applied to the site. As assessed in **Section 4**, while the number of parking spaces at the site is considerably less than this (22 car parks and no parking for coaches), there is no possibly of adverse effects in terms of overspill parking beyond the site.	
The following Site Standards apply to the site access and any parking spaces to be provided: **iv Location and Availability of Parking Spaces** **vi Parking Area and Access Design** **vii Gradient of Car Parks** **ix Reverse Manoeuvring** **x Residential Parking Spaces** **xi Queuing** **xii Set Down Areas** **xiv Surface of Parking and Loading Areas**	The proposed on-site car-parking will comply with all of these requirements.	
v Size of Parking Spaces	All of the proposed on-site car-parking spaces will comply with the dimensional requirements of Appendix 7 of the ODP.	Spaces will also comply with the requirements of standard AS/NZ2890.1:2004[10].
viii Car Spaces for People with Disabilities (a) Car parking areas shall include spaces for people with disabilities provided at the rate of … 11 to 50 spaces: 1 disabled person's space … (a) Car parking for people with disabilities shall be located as close as practicable to the building entrance. The spaces should be on a level surface and be clearly signed.	With a total of 22 car-parking spaces, the disability parking requirement is 1 reserved space. The proposal will comply, with the provision of 3 reserved spaces. These spaces will be located to the Woolshed entry and the accommodation block, with wheelchair access in-between.	Standard AS/NZS2890.6: 2009[11] requires the provision of 2 reserved spaces where the total number of spaces is above 20 – compliance is also achieved.

[10] Parking Facilities. Part 1: Off-Street Car Parking. Standard AS/NZS 2890.1: 2004. *Standards New Zealand, 2004.*

[11] Parking Facilities. Part 6: Off-Street Car Parking for People with Disabilities. Standard AS/NZS2890.6: 2009. *Standards New Zealand, 2009.*

TABLE 5.1: COMPLIANCE WITH DISTRICT WIDE TRANSPORTATION STANDARDS (OPERATIVE DISTRICT PLAN) Section 14 - Transport		
Requirement	**Interpretation & Compliance**	**Comment**
Section 14.2.4 – Site Standards / 14.2.4.2 – Access		
i Length of Vehicle Crossings **ii Design of Vehicle Crossings** **iii Maximum Gradient for Vehicle Access** **iv Minimum Sight Distances from Vehicle Access** **v Maximum Number of Vehicle Crossings** **vi Distances of Vehicle Crossings from Intersections**	The access standards assume the formation of a new vehicle crossing to an existing road. These standards are not applicable to the proposed development, which utilises an existing access road (Woolshed Road) with no new vehicle crossings.	This assessment has demonstrated that the proposed access arrangements will operate both safely and efficiently.

TABLE 5.2: COMPLIANCE WITH DISTRICT WIDE TRANSPORTATION RULES AND STANDARDS (PROPOSED DISTRICT PLAN)
Chapter 29 – Transport

Requirement	Interpretation & Compliance	Comment
Rule 29.4.11 (Subject to Appeal) **- High Traffic Generating Activities.** Any new land-use or subdivision activity, including changes in use that exceeds the traffic generation standards or thresholds set out in Table 29.5. Discretion is restricted to effects on the transport network. **Table 29.5 - Thresholds for new high traffic generating activities, including changes of use** (Subject to Appeal) **Standard 29.9.1** – Residential units – ***Threshold:*** 50 Residential units. **Standard 29.9.3** – Visitor accommodation (guest room type construction). – ***Threshold:*** 150 rooms. **Standard 29.9.4** – Commercial Activities, other than those specifically listed below – ***Threshold:*** 2000m^2. **Standard 29.9.8** – All other activities –***Threshold:*** All other activities 50 or more car parking spaces proposed and/or required under Table 29.5. **Standard 29.9.9** - All other activities including subdivision – ***Threshold:*** Traffic generation of greater than 400 additional vehicle trips per day or 50 additional trips during the commuter peak hour.	The proposed activity is <u>not</u> a High Traffic Generating Activity.	While limited weight can be applied to this rule and associated standards, its applicability to the proposal has been assessed. This assessment has demonstrated that the proposed activity will generate low volumes of additional traffic activity that will be able to be easily accommodated by the immediate and wider road networks.
Table 29.3: Rules - Standards for Activities Outside Roads		
Standard 29.5.1 (Subject to Appeal) - **Minimum Parking Requirements.** The number of parking spaces (other than cycle parking) shall be provided in accordance with the minimum parking requirements specified in Table 29.4, except that where consent is required for a High Traffic Generating Activity pursuant to Rule 29.4.11 no minimum parking is required. **Table 29.4 – Minimum Parking Requirements** **Standard 29.8.7** - Minimum number of carparks required for a ***residential unit*** in all zones, except otherwise listed in standards 29.8.1 - 29.8.5 – Resident/Visitor – 2 per unit. **Standard 29.8.16** (Subject to Appeal) - Guest room type ***visitor accommodation*** (e.g. hotels) in all zones other than zones listed in Rule 29.8.15 – Resident / Visitor - 1 per 3 guest rooms up to 60 guest rooms, plus Staff/ Guest - 1 per 20 beds.	This is <u>not</u> classified as a High Generating Traffic activity. Similar to the approach adopted in relation to Standard 14.2.4.1(i) of the ODP (**Table 5.1**), the University's proposal is a type of activity that is not specifically identified in Table 29.4 of this standard and therefore, Rule 29.4.12 above triggers the need to seek a land use consent in relation to the proposed provision of parking at the site (i.e., 22 parking spaces). Similar to the approach adopted in relation to the ODP, to provide some form of context, the parking requirements for residential units, visitor accommodation as well as place of assembly or place	While limited weight can be applied to this standard and some of the minimum parking requirements listed in Table 29.4, its applicability to the proposal has been assessed. This assessment has demonstrated that the proposed facility will be self-sufficient with regard to parking provision, with no possibility of adverse effects in terms of overspill parking to areas beyond the site. There is no intention for full sized

TABLE 5.2: COMPLIANCE WITH DISTRICT WIDE TRANSPORTATION RULES AND STANDARDS (PROPOSED DISTRICT PLAN)
Chapter 29 – Transport

Requirement	Interpretation & Compliance	Comment
Standard 29.8.28 - ***Place of assembly or place of entertainment*** – Resident / Visitor - 1 car park per 10 persons or 1 car park per 10 m^2 of public floor area, whichever is greater. **Standard 29.8.37** (Subject to Appeal) – ***Convention Centre*** – Resident / Visitor - 1 car park per 10 persons or 1 car park per 10 m^2 of public floor area, whichever is greater. In addition, one coach park per 50 people the site is designed to accommodate.	of entertainment and/or a convention centre could potentially be used to identify potential minimum parking requirements. As assessed in **Table 5.1** in relation to Standard 14.2.4.1(i) of the ODP, between 21 to 118 car parks could be required at the site, as well up to 3 coach parks if the 'convention centre' activity was applied to the site. However, as assessed in **Section 4**, while the number of parking spaces at the site is considerably less than this (22 car parks and no parking for coaches), there is no possibly of adverse effects in terms of overspill parking beyond the site.	buses/coaches to service the facility – a requirement to provide parking spaces for buses/coaches would result in unsightly areas of unused parking.
Standard 29.5.2 – Location and Availability of Parking Spaces. a) parking to be available for staff/visitors during the hours of operation b) no parking to be located on any access of outdoor living spaces, all parking to be accessible c) manoeuvring areas to be unobstructed d) some parking may be provided off-site subject to requirements	All parking spaces provided will be compliant.	
Standard 29.5.3 – Size of Parking Spaces and Layout a) all parking spaces to be designed and laid out in accordance with Table 29.7, Table 29.8 and Diagram 3 of Schedule 29.2	All parking spaces provided will be compliant.	
Standard 29.5.4 – Gradient of Parking Spaces and Parking Areas Parking spaces and parking areas to have a gradient of no more than 1:20 in any one direction	All parking spaces provided will be compliant.	
Standard 29.5.5 – Mobility Parking Spaces a) Minimum number of mobility spaces = 2 (where total number of spaces to be provided is 11 – 100) b) Mobility parking spaces to be level, signposted, on same site, as close as practicable to the building entrance and accessible to the building.	Compliant: three mobility spaces to be provided, all will be signposted/marked. Two will be adjacent to the Woolshed / lecture theatre entrance and one adjacent to the accommodation units. Access between spaces and adjacent buildings will accommodate wheelchairs.	
Standard 29.5.6 – Drop Off / Pick up areas (not applicable)		
Standard 29.5.7 – Reverse manoeuvring		

TABLE 5.2: COMPLIANCE WITH DISTRICT WIDE TRANSPORTATION RULES AND STANDARDS (PROPOSED DISTRICT PLAN) **Chapter 29 – Transport**		
Requirement	**Interpretation & Compliance**	**Comment**
(not applicable)		
Standard 29.5.8 – Residential Parking Space Design (not applicable)		
Standard 29.5.9 – Queuing On-site queuing space to be provided – for parking areas of 3-20 spaces, 6m	Compliant: space available easily exceeds requirement	Low traffic activity levels and location remote from public road frontage means that potential queuing is not an issue
Standard 29.5.10 – Loading Spaces (not applicable)		
Standard 29.5.11 – Surface of Parking Spaces, Parking Areas and Loading Spaces a) Surface to be formed, sealed or otherwise maintained so as to avoid creating a dust or noise nuisance, to avoid water ponding on the surface and to avoid run-off onto adjoining roads b) First 10m from traffic lanes to be formed and sealed to avoid migration of materials onto public road	Compliant: all parking areas will have a compacted surface	
Standard 29.5.12 – Lighting of parking areas (subject of a separate assessment)		
Standard 29.5.13 – Bicycle parking and the provision of lockers and showers Bicycle parking, lockers and showers to be provided in accordance with minimum requirements in Table 29.6. Layout of short-term bicycle parking as per Diagram 5 of Schedule 29.2.	The University's proposal is not included in the list of activities contained in Table 29.6. Therefore, this standard does not require the University to provide bicycle parking or the provision of lockers and showers. Irrespective, the University is proposing to provide space for the storage for at least 16 bicycles (with some bicycles provided by the University and made available for use by visitors). In addition, access to the staff changing room and associated shower, contained in Hākitekura lecture theatre, may be available for day visitors who cycle to the site.	The intent of the standard is to encourage cycling as a mode of travel for commuters / shoppers. In this case, cycling will be as a recreational activity
The following standards apply to the site access: **Standard 29.5.14: Access and Road Design** **Standard 29.5.16: Design of Vehicle Crossings – Rural Zone**	The access standards are not applicable, since they relate to the formation of a new vehicle crossing to an existing road	Where these standards are subject to appeal, limited weight can be applied to these provisions.

TABLE 5.2: COMPLIANCE WITH DISTRICT WIDE TRANSPORTATION RULES AND STANDARDS (PROPOSED DISTRICT PLAN) Chapter 29 – Transport		
Requirement	**Interpretation & Compliance**	**Comment**
Standard 29.5.17: Maximum Gradient for Vehicle Access **Standard 29.5.18: Minimum Sight Distances from Vehicle Access on all roads other than State Highways** **Standard 29.5.20: Maximum Number of Vehicle Crossings** **Standard 29.5.22: Minimum Distance of Vehicle Crossings from Intersections**	These standards are not applicable to the proposed development, which utilises an existing access road (Woolshed Road) with no new vehicle crossings.	However, irrespective of the status of these standard, their applicability to the proposal has been assessed. This assessment has demonstrated that the proposed access arrangements will operate both safely and efficiently.

6 Conclusions & Recommendations

6.1 Conclusions

The University intends to develop a property at Woolshed Bay as an academic retreat and conference facility, Hākitekura, for which a land-use consent is required from QLDC.

This assessment has reviewed the potential transportation effects of the proposal and compliance with the relevant provisions of both the operative and proposed district plans, and concludes that:

- principles of environmental sustainability are central to the design and intended use of the proposed facility and these will include the minimisation of private vehicle travel;
- facilities of this type are characterised by lengthy periods of low usage with occasional periods of high usage;
- even for a 'worst-case' involving the maximum number of people on the site, the number of associated vehicle movements will be low, with most occurring outside of the busier morning and evening peak periods;
- subject to the provision of passing places on Woolshed Road, any effects upon the operational efficiency or safety of the wider road network (including Maori Jack Road and its intersection with State Highway 6) will be negligible;
- the number of on-site parking spaces is expected to meet the demands generated by activities on the site;
- uncertainty in the estimation of parking demands has been acknowledged with the identification of an area to accommodate any occasional overspill parking – this will ensure that the site will be self-sufficient in parking provision with no adverse effects upon adjoining areas;
- except for the provision of parking at the site, the proposal will comply with all of the relevant requirements of both the operative and proposed district plans; and
- overall, any adverse effects associated with the proposed activities will be less than minor.

6.2 Recommendations

It is recommended that:

- provision for vehicle passing be made along the Woolshed Road access, as described;
- a condition be volunteered to the effect that no full-size coaches will visit the site; and
- on the basis of the transportation issues addressed by this assessment, consent be granted for the proposal.

APPENDIX 6:

Assessment of Environment Noise Effects

Acoustic Engineering Services, May 2020

www.aeservices.co.nz
office@aeservices.co.nz
Auckland +64 9 917 0369
Wellington +64 4 890 0122
Christchurch +64 3 377 8952

Report Number: AC20055 – 02 – R1

Hākitekura Development
Jacks Point, Queenstown

Assessment of Environmental Noise Effects

Prepared for:
University of Otago
111 Albany Street
Dunedin 9054

Issued:
1 May 2020

Revision History

Reference	Status	Date
AC20055 – 02 – R1	Revision 3	1 May 2020

Document Acceptance

Author	Signature
James Boland Senior Acoustic Engineer	
Reviewer	**Signature**
William Reeve *BE Hons (Mech) MASNZ* Senior Acoustic Engineer	
Approver	**Signature**
Dr Jeremy Trevathan *PhD (Acoustic) BE Hons (Mech)* Principal Acoustic Engineer	

Table of Contents

This page has been left intentionally blank.

1.0 BACKGROUND

Acoustic Engineering Services (AES) has been engaged to provide acoustic engineering advice in relation to an Application for Resource Consent for the proposed Hākitekura Development at Woolshed Bay, Jacks Point in Queenstown.

The Applicant requires an assessment of the environmental noise emitted by this activity, with regard to section 104 (1) of the Resource Management Act (RMA), which requires the actual and potential effects of the activity on the environment to be considered.

We have based our analysis on the following:

- Developed Design drawings titled *University of Otago – Resource Consent issue preliminary, Hākitekura, Queenstown*, prepared by Kerr Ritchie, dated 6 April 2020.
- *University of Otago, Hākitekura Redevelopment – Academic Retreat and Conference Facility, Scoping Report*, prepared by Planz Consultants, dated 20 March 2019.
- *Proposed Hākitekura, Woolshed Bay, Queenstown, Integrated Transportation Assessment,* prepared by Tim Kelly Transportation Planning Ltd, dated May 2020.

1.1 Site and surrounding areas

The development will provide conference facilities through refurbishment of the existing woolshed lodge building and the construction of a new lecture theatre wing. Some existing buildings will be demolished. Accommodation will be provided for conference delegates in new buildings planned for one part of the site. The proposed new buildings include:

- "Hākitekura Wing" Lecture Theatre

  This building will provide lecture facilities for 60 people initially, with a future planned extension able to cater for an additional 60 participants.

- Accommodation buildings
- A total of 16 visitor accommodation units would be provided across five separate buildings. A three-bedroom residential unit for staff would also be provided.
- Bicycle storage and Plant room

  The combined bicycle storage facility and plant room will house the outdoor units for heating and cooling of the Hākitekura Wing.

- Garage

  A triple bay garage will house the University's proposed minibus and other site vehicles, including on-site staff vehicles.

The buildings will be separated by landscaping and joined by footpaths. There will be three outdoor areas adjacent to the Lecture Theatre that will provide break out and dining spaces. Car parking will be provided in four areas and waste management will be centralised, with waste collections occurring from the central location.

We understand the closest noise sensitive receivers are as follows, as shown in figures 1.1 and 1.2.

- Receivers A and B: Dwellings located to the north.
- Receiver C: Homestead Bay Village – a proposed residential development to the east.

Figure 1.1 – Hākitekura site and receiver locations

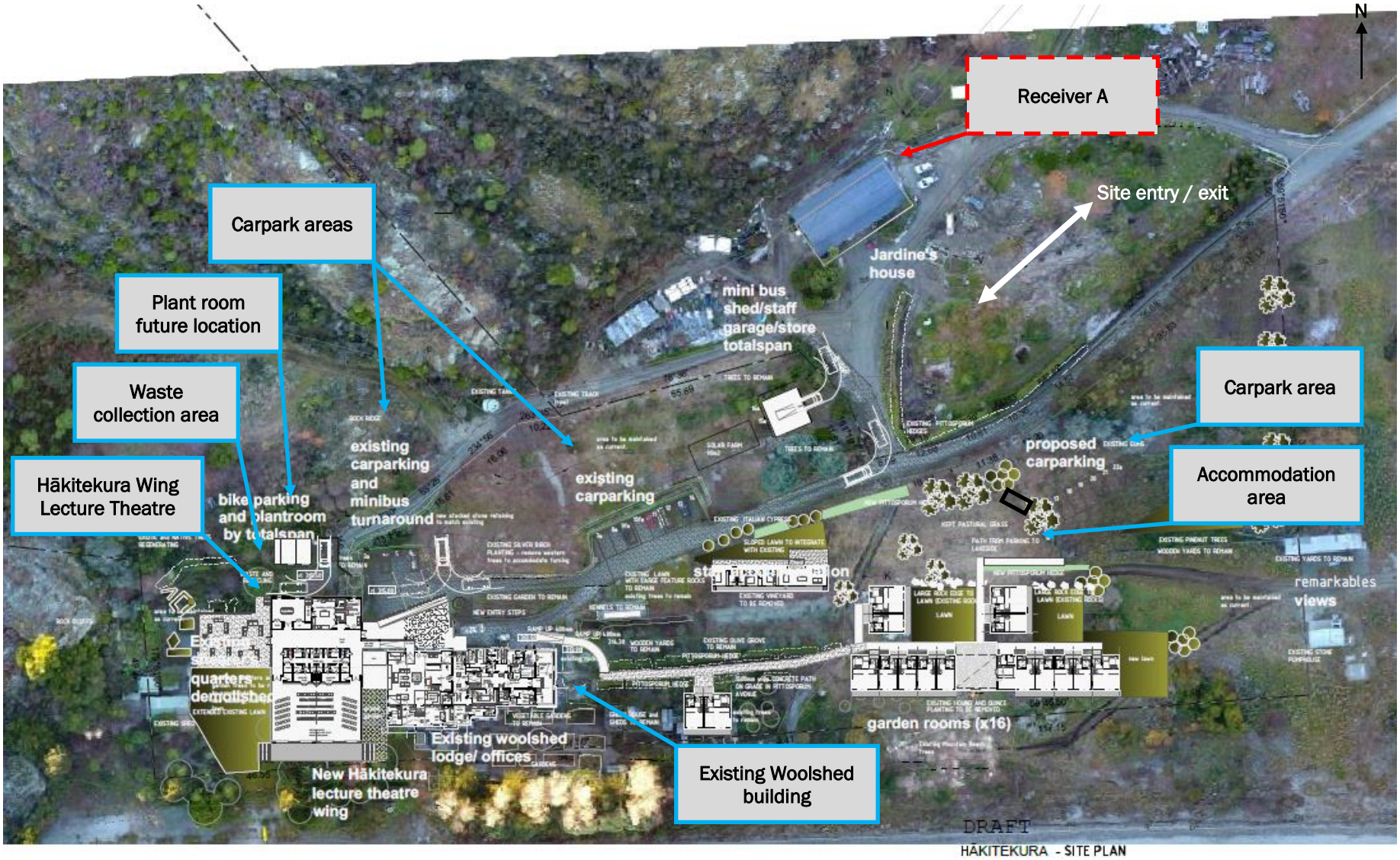


Figure 1.2 – Hākitekura development site plan

1.2 Proposed activity

The completed project will primarily be used by the University as an academic retreat, where people can attend conferences and stay on-site for the duration of the conference. The conference activities would typically occur between 8:00 am and 6:00 pm, with some evening functions attached.

The facility may occasionally be used by third parties for functions such as weddings. These functions would typically occur between 8:00 am and midnight. Accommodation for attendees of third-party functions is expected to occur off-site.

Based on our understanding of the likely nature and extent of activities which may take place on the site, the following noise sources may be associated with the development:

- Noise generated by vehicle (light vehicles and service vehicles) movements as they arrive and depart.
- Noise from the proposed Lecture Theatre and existing Woolshed building (the Woolshed), such as amplified music and speech.
- Noise from people talking in the courtyards, terrace area and car parks.
- Noise from external plant associated with the building heating and cooling systems.
- Noise generated during waste collection, from a centralised location.
- There will be a backup electrical generator for use during emergencies only.

2.0 ACOUSTIC CRITERIA

The Resource Management Act requires consideration of the significance of any adverse effects associated with the proposal. Guidance as to the significance of any adverse noise effects may be obtained from several sources.

2.1 Operative Queenstown Lakes District Plan

According to the Operative District Plan (ODP), the site is located in the Resort Zone - Jacks Point Zone, as are all the surrounding receivers. The Queenstown Lakes District Plan, Volume 1, Section 12 *Zone Standards: Resort Zone Rules, 12.2.5.2 ix Noise*, states:

> *(a) In the Millbrook Resort and Jacks Point Zones sound from non-residential activities measured in accordance with NZS 6801:2008 and assessed in accordance with NZS 6802:2008 shall not exceed the following noise limits at any point within the Residencies Activities Areas shown on Figure 1 and the Structure Plans*:
>
> | | | | |
> |---|---|---|---|
> | *(i)* | *daytime* | *(0800 to 2000 hours)* | *50 dB $L_{Aeq(15\ min)}$* |
> | *(ii)* | *night-time* | *(2000 to 0800 hours)* | *40 dB $L_{Aeq(15\ min)}$* |
> | *(iii)* | *night-time* | *(2000 to 0800 hours)* | *70 dB L_{AFmax}* |

Part (c) of Rule 12.2.5.2ix states:

> *(c) Sound from non-residential activities which is received in another zone shall comply with the noise limits set in the zone standards for that zone.*

Further, Lake Wakatipu and a strip of lakefront to immediate south and west of the proposed lecture theatre is zoned Rural. As such, the Rural noise limits are also relevant to this assessment, however we note there are no residential units in that area. Rule 5.3.5.2v Noise states:

> *(a) Sound from non-residential activities measured in accordance with NZS 6801:2008 and assessed in accordance with NZS 6802:2008 shall not exceed the following noise limits at any point within the notional boundary of any residential unit, other than residential units on the same site as the activity:*
>
> | | | | |
> |---|---|---|---|
> | *(i)* | *daytime* | *(0800 to 2000 hours)* | *50 dB $L_{Aeq(15\ min)}$* |
> | *(ii)* | *night-time* | *(2000 to 0800 hours)* | *40 dB $L_{Aeq(15\ min)}$* |
> | *(iii)* | *night-time* | *(2000 to 0800 hours)* | *70 dB L_{AFmax}* |

We note the application site and the nearest receivers are located in the Farm Building and Craft Activity Area, which is not a 'residential activity area'. We understand that part of the planned Homestead Bay Village development includes an 'Open Space - Residential' area and the noise limits above would apply to noise from the application site to that part of the Homestead Bay Village development.

2.2 Proposed Queenstown Lakes District Plan (Decision Version) noise standards

According to the Proposed District Plan (PDP), the site and surrounding receivers are located within the Jacks Point Zone, as shown on the Decisions Version Map 41. The site is located within an Open Space – Residential (North) Activity Area within this zone.

The noise limits which apply at any point within any site in a Residential Activity Area are outlined in the PDP – Decision Version, Part 5, Chapter 36 *Noise, 36.5 Rules – Standards, Table 2: General Standards, 36.5.2* and are as follows:

(i)	*daytime*	*(0800 to 2000 hours)*	*50 dB $L_{Aeq(15\ min)}$*
(ii)	*night-time*	*(2000 to 0800 hours)*	*40 dB $L_{Aeq(15\ min)}$*

The adjacent noise sensitive receivers are in the same Activity Area as the application site.

We understand part of the planned Homestead Bay Village development would be located in the Homestead Bay Village Activity Area. According to the PDP – Decision Version, Part 5, Chapter 36 *Noise, 36.5 Rules – Standards, Table 2: General Standards, 36.5.4,* the noise from any activity would need to meet the following noise limits at that part of the Homestead Bay Village development:

(i)	*daytime*	*(0800 to 2000 hours)*	*60 dB $L_{Aeq(15\ min)}$*
(ii)	*night-time*	*(2000 to 0800 hours)*	*50 dB $L_{Aeq(15\ min)}$*

We note the development is located outside of the Queenstown Airport Outer Control Boundary.

PDP Rule 36.4.7 states that noise from emergency and backup electrical generators is a permitted activity where they are operating for emergency purposes or operating for testing and maintenance for less than 60 minutes each month during a weekday between 9:00 am and 5:00 pm. This rule is not subject to appeal at the time of writing this report.

2.3 Construction noise

Both the operative and proposed District Plans refer to NZS 6803:1999 *Acoustics – Construction Noise* (NZS 6803:1999) for noise from construction activity.

The proposed plan states that construction noise must be measured and assessed in accordance with NZS 6803:1999. Construction noise must comply with the recommended upper limits in Tables 2 and 3 of NZS 6803:1999 and be managed in accordance with NZS 6803.

2.4 Reverse sensitivity

We note the development is located approximately 2 km from State Highway 6 (SH6), therefore noise from SH6 will not affect the development.

There is a sky diving centre (NZONE) located north west of the application site. The application site is well outside the 55 dB L_{Adn} noise contour associated with typical operation of the airstrip. We note there is a contingent flight path that passes close to the application site (Flight Path C). We understand that noise levels would only potentially exceed 55 dB L_{Adn} (by 1 dB) if over 80 % of arrivals used "Arrivals Path C". This is unlikely to ever occur and so we do not expect noise from NZONE will be problematic for this development.

2.5 New Zealand Standard 6802

NZS 6802:2008 *Acoustics – Environmental noise* (NZS 6802:2008) outlines a guideline daytime limit of 55 dB $L_{Aeq\ (15\ min)}$ and a night-time noise limit of 45 dB $L_{Aeq\ (15\ min)}$ for "the reasonable protection of health and amenity associated with the use of land for residential purposes".

We note that the Standard provides guidelines in section 8.3 regarding 'daytime' and 'night-time' for use in situations where these are not specified. The timeframe recommended is 0700 to 2200 hours for daytime, and 2200 hours to 0700 hours for night-time.

2.6 World Health Organisation

Guidelines for Community Noise[1], a document produced by the World Health Organisation (WHO) based on extensive international research recommends a guideline limit of 55 dB L_{Aeq} to ensure few people are seriously annoyed in residential situations. A guideline limit of 50 dB L_{Aeq} is recommended to prevent moderate annoyance. A guideline night-time limit of 45 dB L_{Aeq} is recommended to allow occupants to sleep with windows open.

2.7 Conclusions regarding appropriate noise levels

Based on the above, we observe that the Operative and Proposed District Plan noise limits of 50 dB $L_{Aeq(15\ minute)}$ for the daytime and 40 dB $L_{Aeq(15\ minute)}$ for night-time, are more stringent than the guideline noise limits discussed in NZS 6802:2008 and the WHO Guidelines for Community Noise (1999), and would therefore be suitable for this development.

We note the assessment point for the noise limits in this zone is at the receiver property boundary which, for Receiver A and B, is very close to Woolshed Road which traffic to and from the application site will use. To assess noise at property boundaries is common for urban residential settings but uncommon for assessments in rural or open space areas where the sensitive dwellings could be set well back from the property boundary. Applying the noise limit at the property boundary would effectively protect a part of the property that does not include a sensitive use. Regarding Receiver A, we consider it appropriate to consider the effects of noise from vehicle movements associated with the development at both the property boundary and notional boundary.

[1] Edited by Berglund, B *et al. Guidelines for community noise.* World Health Organization 1999.

3.0 NOISE FROM THE PROPOSED ACTIVITY

SoundPLAN (v8.1) computational noise modelling, based on ISO 9613 *Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation*, has been used to calculate the propagation of noise from the site taking into account the topography of the area, and sound power levels for each of the noise sources.

3.1 Expected noise from events (Conferences and Third-party functions)

For the purpose of assessing noise from these events, a worst-case noise scenario was modelled which included the cumulative noise emission from all the relevant noise generating activities from functions happening concurrently across the site during an event. Noise sources and emission levels were selected based on the type of events planned.

Expected noise levels due to the conversation of people in the outdoor areas have been based on the American National Standards Institute Standard ANSI S3.5 – 1997 *Methods for calculation of the Speech Intelligibility Index*, which contains information on the typical speech levels for both male and female speakers. Based on average values, for a raised voice effort, the sound power of a speaker may be deduced to be 78 dB L_{WA}, with a sound power of 71 dB L_{WA} for a normal voice effort.

Details of the noise sources included in the event modelling are shown in table 3.1.

Table 3.1 – Noise sources used in event modelling

Noise source	Source noise level dBA
Average sound pressure level inside the Lecture Theatre. Includes loud amplified music or speech for functions that may include a full band at loud volumes.	98[1]
Average sound pressure level inside the Woolshed. Includes amplified music or speech for functions that may include an acoustic duo or DJ.	95[1]
People speaking and vehicle noise in the carpark areas	78 L_W [2]
People speaking in the outdoor areas: 60 people in the main courtyard 20 people in the entry area courtyard 20 people on the terrace	75 L_W [3]
Mechanical plant units inside plant room[4]	78 L_W per unit

Note 1 The sound pressure level (SPL) includes a penalty for special audible characteristics to allow for potential "bass beat" from amplified music, which can be a feature of some types of music. The SPL has been applied at all inside parts of the space to allow for the possibility of different function layouts depending on the required production values. To give context to the noise level, the modelled SPL occurring across the entire internal part of the space would be loud and make conversation very difficult. The actual noise levels during events will likely be lower than those modelled.

Note 2 The sound power level represents two people speaking in raised voices in each car park area and an additional 3 dB contribution from car engine noise.

Note 3 The sound power level has been factored to represent 50% of the people speaking at any one time in each listed location.

Note 4 The plant room design has an open front facing to the south.

The modelling has allowed for glazing elements to be partially open on the south facing facades of the Lecture Theatre and Woolshed buildings to provide for natural ventilation to those spaces if required.

We expect that peak periods of traffic movement and peak noise from the event will not occur concurrently and so the noise levels outlined below represent the worst-case levels expected for each of those activities separately. The results of modelling for traffic noise is shown in section 3.2.

Based on the event noise modelling, the expected noise levels at the nearest point on the property boundaries of the receivers are summarised in table 3.2.

Table 3.2 – Expected noise levels during events

Receiver	Property name	Expected noise level $L_{Aeq\ (15\ min)}$	
		Stage 1	Stage 2
A	Lot 2, 5DP452315	40	40
B	Lot 4, DP452315	22	22
C	Lot 101-105 13DP517771 Homestead Bay Village (Nearest point on boundary)	27	27

We therefore expect the noise levels received at the boundaries of the neighbouring receivers to comply with the ODP and PDP night-time noise limit of 40 dB $L_{Aeq(15\ min)}$ and for the associated noise effects to be minimal during all time periods.

As shown in table 3.2, the noise levels from functions are not expected to increase noticeably due to the planned extension of capacity of the lecture theatre (Stage 2). An increase in noise from activity associated with extended Lecture Theatre will be largely offset due to the fact that the outdoor courtyard area west of the Lecture Theatre will be further from the receivers and the extended building will provide improved screening from that source of noise. Noise from the movement of vehicles after completion of the planned extension is discussed further in section 3.2.

The results of the noise modelling for event noise are presented graphically as noise contour maps shown in Appendix A.

3.2 Expected noise levels from vehicles approaching and departing the site

We have reviewed the project Integrated Transportation Assessment, prepared by Tim Kelly Transportation Planning Ltd, and considered the noise associated with vehicle traffic approaching and departing the site. Access to the application site is via Woolshed Road, which also services Receiver A and B.

We expect the highest level of noise emission from traffic would occur prior to the start of events and again after the finish of events, over a period of approximately one hour at each of those times. During the events there would likely be much less traffic moving to and from the site.

The number of vehicles expected to use Woolshed Road to access the site is shown in table 3.3. The estimated vehicle flow volumes are based on information provided in the Integrated Transportation Assessment relating to the extended lecture theatre capacity (Stage 2). The composition of traffic using the road is expected to be mainly light vehicles.

Table 3.3 – Estimated vehicle volumes for Stage 2

Traffic flow condition	Number of vehicle passbys over one hour
Prior to and after events (Peak traffic flow period)	50
During events	2

The hourly traffic noise levels were converted to 15-minute traffic noise levels, assuming an even distribution of traffic over the one-hour period, to allow a comparison with the PDP noise limits which are based on 15-minute noise levels. The expected levels of noise from vehicle traffic, at the property boundary assessment point, is shown in table 3.4.

Table 3.4 – Expected noise levels from traffic at the receiver property boundaries

Receiver	Property name	Expected noise level $L_{Aeq\ (15\ min)}$	
		Before and after events (for a one-hour period only)	During events
A	Lot 2, 5DP452315	54	42
B	Lot 4, DP452315	47	35
C	Lot 101-105 13DP517771 Homestead Bay Village (Nearest point on boundary)	18	<10

Receiver A

It can be seen from table 3.4 that, due to the proximity of the road to the property boundary assessment point, the noise level from traffic is expected to exceed the daytime ODP and PDP noise limit (50 dB $L_{Aeq(15\ min)}$) at Receiver A by 4 dB during the period when traffic is approaching the site prior to and after an event. If the event at the site finished after 8:00 pm and traffic left this site according to the estimated flow volume then the night-time ODP and PDP noise limit would likely be exceeded by up to 14 dB.

The noise level from traffic is expected to comply with the daytime noise limit at Receiver A during the events, between the times of 8:00 am and 8:00 pm. Noise from intermittent traffic flow during events that extend beyond 8:00 pm is expected to exceed the night-time noise limit by 2 dB at Receiver A.

However, considering noise levels at the property boundary does not give a reasonable indication of the noise effects which will be experienced at and in the areas immediately around the dwelling. The noise level at the notional boundary of Receiver A (at 20 m from the dwelling) is expected to be less than 40 dB $L_{Aeq(15\ min)}$ during peak traffic flow conditions and well below the daytime and night-time noise limits during the events. These noise levels received at the dwelling notional boundary are consistent with the protection of sleep disturbance and will be acceptable during all periods and flow conditions. We therefore expect the associated noise effects from vehicles approaching and departing the site will be minimal.

Noise from the intermittent passby of a heavy vehicle on the road, such as the waste collection truck, is expected to comply with the ODP and PDP daytime noise limit at the most exposed receiver (Receiver A). We recommend the waste collection activity be undertaken only during the daytime (8:00 am to 8:00 pm) period.

Receiver B

We note that noise from vehicles on public roads is a permitted activity according to Rule 36.4.1 of the PDP. However, we have been advised by Tim Kelly Transportation Planning Ltd that the section of Woolshed Road beyond the application site is privately owned and not classified as a public road. As such, the ODP and PDP noise limits would apply to noise from traffic on Woolshed Road to Receiver B.

While the night-time ODP and PDP noise limit (40 dB $L_{Aeq(15\ min)}$) would be exceeded at the property boundary of the site, noise from roads is typically assessed at the facade of the subject building. Our assessment has shown that noise levels during the peak periods of event traffic flow is expected to be 41 dB $L_{Aeq(15\ min)}$. at the most exposed facade of the dwelling. We therefore expect the associated noise effects will be minor.

Receiver C

Noise levels from traffic would be less than 20 dB L_{Aeq} during all flow conditions and time periods, which complies with the noise limits. We therefore expect the associated noise effects will be minimal.

3.3 Waste collection

We understand that waste will be stored in one central location and removed by a waste collection truck from that location. Noise from waste collection activity was modelled using a sound power level of 89 dB L_{WA}, which represents loading and unloading of large bins by the collection truck. The expected noise levels from the waste collection activity at the centralised location is shown in table 3.5.

Table 3.5 – Expected noise from waste collection activity

Receiver	Property name	Expected noise level LAeq (15 min)
A	Lot 2, 5DP452315	35
B	Lot 4, DP452315	14
C	Lot 101-105 13DP517771 Homestead Bay Village (Nearest point on boundary)	15

It can be seen from table 3.5 that the noise from the waste collection activity is expected to comply with the relevant Plan daytime and night-time noise limits, and the effects of this activity are expected to be minimal.

3.4 Noise from external mechanical plant for heating and cooling

The Lecture Theatre will be serviced by outdoor units located inside the plant room, north east of the main building (see figure 1.2). The event noise modelling in section 3.1 included noise from the units operating in the plant room and the number of units was doubled for modelling of the Stage 2 scenario.

We understand the existing Woolshed building will continue to be serviced by an existing geothermal heat pump system which is enclosed within the building and not expected to be a significant source of environmental noise.

The accommodation buildings will be serviced by a centralised geothermal heat pump system which will be enclosed inside one of the buildings and not expected to be a significant source of environmental noise.

We note that noise emission from mechanical ventilation systems associated with the kitchens or bathrooms is not expected to be significant when considered in context with the other sources of noise associated with the development.

3.5 Emergency electrical power generator

A diesel-powered electrical power generator unit will be installed inside the plant room to provide a backup source of electrical power to the facility in the event of an emergency including unscheduled power loss. We note noise associated with backup power generation during an emergency is a permitted activity according to PDP Rule 36.4.7. Rule is 36.4.7 is not subject to appeal and is appropriate to apply to the development.

4.0 CONSTRUCTION NOISE

Noise generated by activities associated with demolition of existing buildings and construction of the new buildings, civil works and landscaping has the potential to adversely affect adjoining properties, especially if carried out during the early morning or evening hours.

We therefore recommend that the Applicant adopts best practice procedures to reduce the likelihood of annoyance, nuisance and adverse health effects to people in the vicinity of construction work, and that these activities are planned and managed in accordance with *NZ 6803:1999 Acoustics – Construction Noise* (NZS 6803:1999), and that construction is undertaken to ensure noise does not exceed the sound levels specified in Table 2 of the Standard.

5.0 CONCLUSION AND RECOMMENDATIONS

AES has been engaged to provide acoustic engineering advice in relation to an Application for Resource Consent for the proposed Hākitekura development at Woolshed Bay, Jacks Point in Queenstown.

Noise from all the significant sources of noise expected to be associated with the development have been considered and assessed against the relevant noise limits. Based on our review of national and international guidance, we observe that the Operative District Plan (ODP) and Proposed District Plan (PDP) noise limits of 50 dB $L_{Aeq(15\ minute)}$ for the daytime and 40 dB $L_{Aeq(15\ minute)}$ for night-time, are more stringent than the guideline noise limits discussed in NZS 6802:2008 and WHO Guidelines and would therefore be suitable for this development.

Noise levels from events including amplified music and people outside are expected to comply with the relevant ODP and PDP limits. We therefore expect the associated noise effects from this activity will be minimal.

We note the assessment point for the noise limits in this zone is at the receiver property boundary which, for Receiver A and B, is very close to Woolshed Road which traffic to and from the application site will use. To assess noise at property boundaries is common for urban residential settings but uncommon for assessments in rural or open space areas where the sensitive dwellings could be set well back from the property boundary. Applying the noise limit at the property boundary would effectively protect a part of the property that does not include a sensitive use. Regarding Receiver A, we consider it appropriate to consider the effects of noise from vehicle movements associated with the development at both the property boundary and notional boundary.

During peak traffic flow, our assessment has shown that noise from vehicle movements to and from the site has the potential to exceed the ODP and PDP limits at the property boundary of Receiver A. However, noise levels received at the dwelling notional boundary will be less than 40 dB $L_{Aeq(15\ min)}$ during all periods and flow conditions. We therefore expect the associated noise effects from vehicles approaching and leaving the site will be minimal.

We note that noise from vehicles on public roads is a permitted activity according to Rule 36.4.1 of the PDP. However, we have been advised by Tim Kelly Transportation Planning Ltd that the section of Woolshed Road beyond the application site is actually part of the adjacent lot, so not classified as a public road. As such, the noise limits would apply to noise from traffic on Woolshed Road received at Receiver B. Noise from roads is typically assessed at the facade of the subject building. Our assessment has shown that noise levels during the peak periods of event traffic flow is expected to be 41 dB $L_{Aeq(15\ min)}$. at the most exposed facade of the dwelling. We therefore expect the associated noise effects will be minor

Noise from waste collection activity at the centralised location is expected to comply with the daytime noise limit. We therefore expect the associated noise effects from waste collection to be minimal if undertaken during daytime hours (8:00 am to 8:00 pm).

Noise from external mechanical plant for heating and cooling is expected to comply with the daytime and night-time noise limits. We therefore expect the associated noise effects from mechanical plant will be minimal.

We note noise associated with backup power generation during an emergency is a permitted activity according to PDP Rule 36.4.7. Rule is 36.4.7 is not subject to appeal and is appropriate to apply to the development. The diesel-powered electrical power generator unit will be installed inside the plant room and noise effects from the permitted use of the generator will be less than minor.

To give confidence that noise emissions associated with the activity are maintained at appropriate levels, we recommend the following mitigations for the activities associated with the site:

- Undertake waste collection activity during between 8:00 am and 8:00 pm only.
- During events in the Lecture Theatre or Woolshed that involve amplified music or speech, keep windows and doors closed on all facades except those that face south.
- We recommend that the Applicant adopts best practice procedures to reduce the likelihood of annoyance, nuisance and adverse health effects to people in the vicinity of construction work, and that these activities are planned and managed in accordance with NZS 6803:1999, and construction is undertaken to ensure noise does not exceed the sound levels specified in Table 2 of the Standard.

Appendix A

Noise contour plots – Event noise (Conferences and third-party functions)

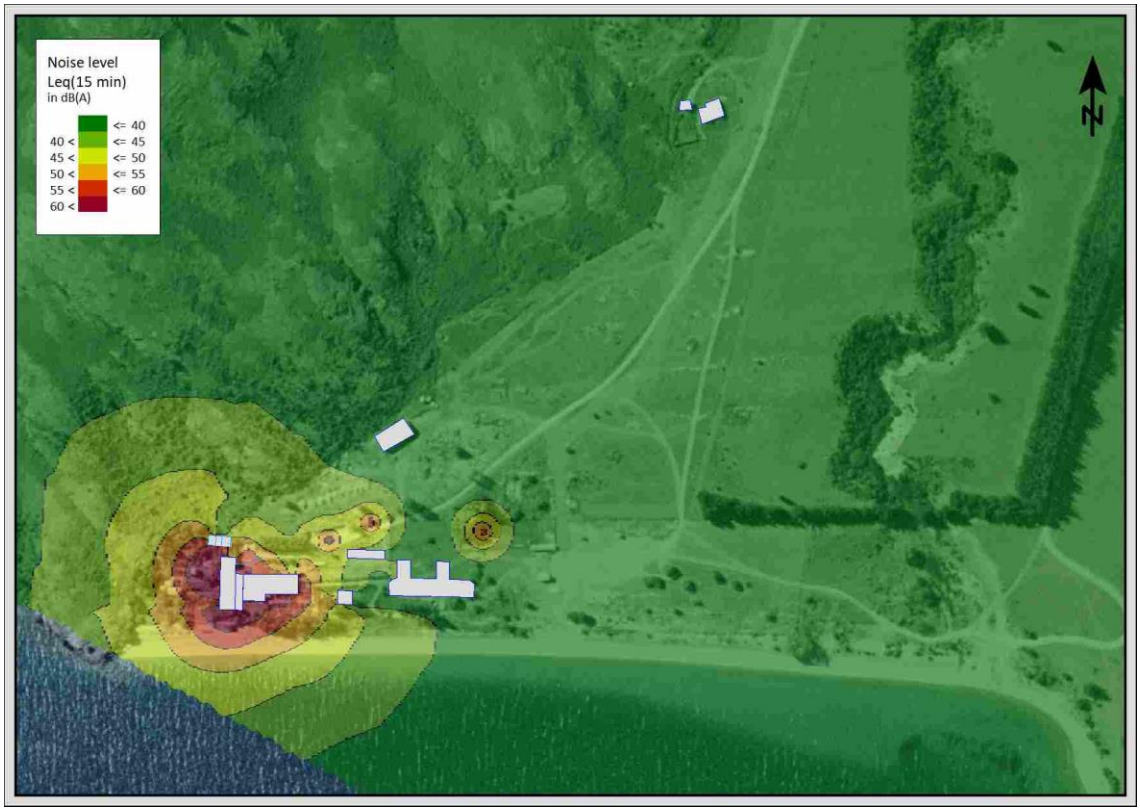


Figure A1 – Expected noise from events – Stage 1

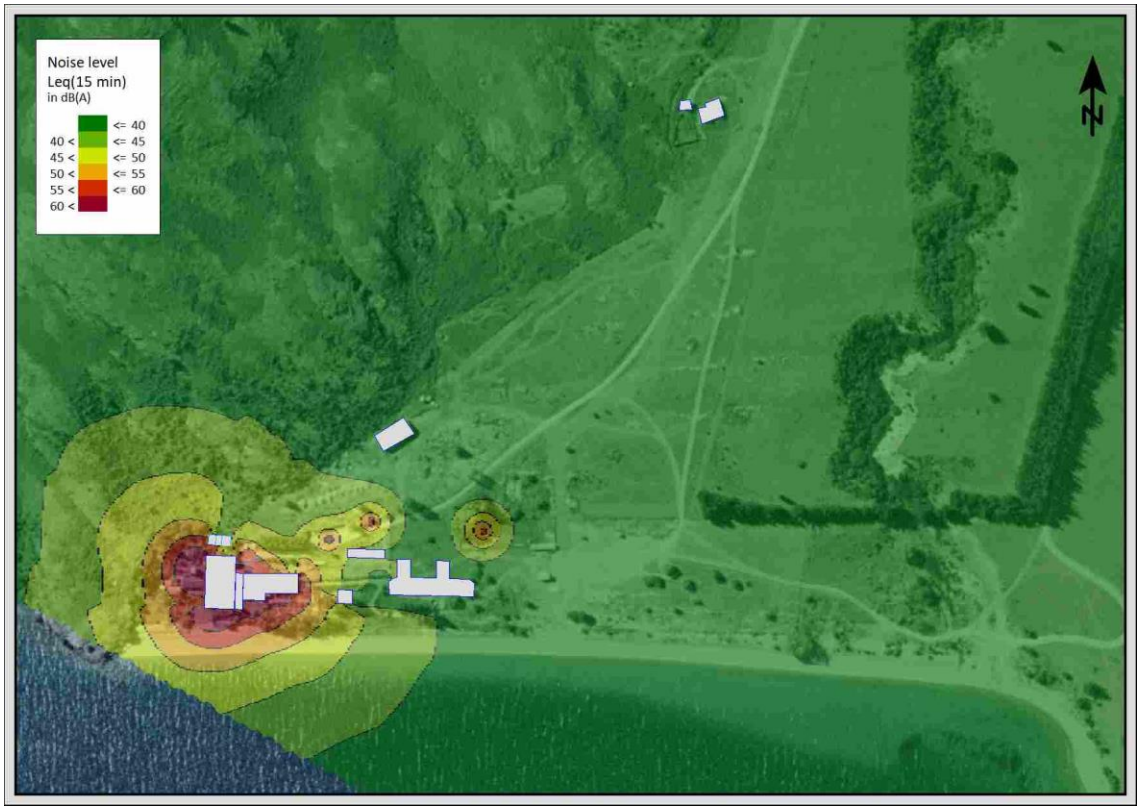


Figure A2 – Expected noise from events – Stage 2

APPENDIX 7:

Landscape and Visual Assessment

Vivian + Espie, June 2020

LANDSCAPE AND VISUAL ASSESSMENT

PREPARED FOR:

UNIVERSITY OF OTAGO

9 JUNE 2020

PROPOSAL TO ALTER AND ADD TO BUILDINGS AT HOMESTEAD BAY TO ESTABLISH AN ACADEMIC RETREAT AND CONFERENCE FACILITY

vivian+espie

INTRODUCTION

1 The purpose of this report is to accompany a resource consent application to develop an academic retreat and conference facility to operate as part of the University of Otago. The subject landholding is 39,381m^2 and consists of Lots 1 and 3 (DP DP452315). The existing buildings that are to be redeveloped as part of the proposal were previously farm buildings, including the Jardine family homestead, being part of the farm base area of Remarkables Station at Homestead Bay.

2 This report identifies and evaluates the landscape and visual effects likely to arise from the proposal. The site is within the Jack's Point Zone (**JPZ**) of Queenstown Lakes District. All proposed activities are contained within the Open Space Residential (**OSR**) Activity Area of the JPZ pursuant to the decisions version of the Proposed District Plan (**PDP**), and the Farm Buildings and Craft Activity Area (**FBA**) pursuant to the Operative District Plan (**ODP**).

ASSESSMENT METHODOLOGY

3 The methodology for this assessment has been guided by:

- The landscape related Objectives, Policies and Assessment Matters of the Queenstown Lakes PDP and ODP;
- The Guidelines for Landscape and Visual Impact Assessment produced by the UK's Landscape Institute and Institute of Environmental Management and Assessment[1];
- The New Zealand Institute of Landscape Architects "Landscape Assessment and Sustainable Management" Practice Note[2];
- The landscape assessment guidance of the Quality Planning Resource[3];
- The Joint Witness Statement of landscape witnesses regarding landscape methodology in relation to the appeals on Stage 2 of the PDP[4].

[1] Landscape Institute and Institute of Environmental Management and Assessment; 2013; 'Guidelines for Landscape and Visual Impact Assessment – 3rd Edition'; Routledge, Oxford.
[2] New Zealand Institute of Landscape Architects Education Foundation; 2010; Best Practice Note 10.1 'Landscape Assessment and Sustainable Management'.
[3] http://www.qualityplanning.org.nz/node/805
[4] Joint Statement Arising from Expert Conferencing, Topic: Landscape Methodology and Subtopics 2,3,5,6,7,8, and 10, 29 January 2019,

LANDSCAPE DESCRIPTION

4 On a broad scale, the Coneburn Valley is a wide, relatively open Valley that runs south from Frankton and the Kawerau River to Homestead Bay. Pursuant to both the ODP and the PDP, the southern half of this valley is occupied by the JPZ, which provides for residential, commercial, and resort-like development. The JPZ is split into three distinct areas known as Homestead Bay, Jack's Point, and Hanley's Farm. Homestead Bay occupies the southernmost part of the JPZ and is currently largely undeveloped. In contrast, Jack's Point is an established residential development, and Hanley Farm is in the early stages of development with many residences under construction or newly completed. Further development for both is ongoing.

5 The JPZ is located approximately four kilometres south of Frankton and is accessed off State Highway 6. The zone sits between Lake Wakatipu and the Remarkables. To the east are views of the Remarkables and to the southwest are views of Lake Wakatipu and the peaks beyond. From Homestead Bay, the prominent views are over Lake Wakatipu towards Cecil Peak to the west and Bayonet Peak to the southwest.

6 The topography of Homestead Bay gently rises from the shores of Lake Wakatipu to a relatively flat terrace, traversed by small gullies, and featuring rolling natural depressions and mounds.

7 Homestead Bay is the last part of the JPZ to be developed. A road connecting Jack's Point to Homestead Bay (Homestead Bay Road) is now largely constructed. Earthworks are being carried out to create several large residential allotments on the southern half of Homestead Bay at Nathanael Place. At present, the shorefront remains undeveloped and relatively natural. However, the ODP and the PDP provide for mixed-use development and marina activity in this area in the future.

8 The location of the proposed activities themselves (**the site**) sits in the north-western corner of the Homestead Bay area. The site is nestled between Jack's Point Hill to the north and Lake Wakatipu to the southwest. Most of the site is a gentle gradient, gradually rising from the shores of Lake Wakatipu to the Base of Jack's Point Hill, although becomes steeper in the north-western corner.

9 The site was previously rural and was the farm base area of Remarkables Station for many decades. Now it sits within the Homestead Bay area of the JPZ and both the ODP and PDP provide for mixed-use development in this area. The site sits within the OSR (north) activity area

defined in the Homestead Bay Structure Plan of the PDP. The OSR (north) provides for up to ten residential units within a relatively large area. It is anticipated that, pursuant to the proposed controls on density and landscaping, future residential units will sit within large sites, with the majority of the site remaining open, creating a rural residential character.

10 The site sits between the Open Space Foreshore (**OSF**) activity area to the east and the Open Space Golf (**OSG**) activity area to the north. Both activity areas are intended to remain as open space providing for recreational activity and native revelation. Approximately 400m east of the site is the Boating Facilities (**BFA**) and Village Homestead Bay (**V(HB**)) activity areas that provide for a marina and mixed-use village centre for Homestead Bay.

11 Much of the site and surrounding areas remain relatively open, rough pastoral landscape. Several agricultural elements including fence lines, shelterbelts, yards, and sheds remain, highlighting the area's agricultural history. The site and associated buildings have been part of Remarkables Station for over a century. Historically the woolshed was used for shearing and sheep work, and the shearers quarters were to accommodate staff. The woolshed was then converted into a home and formed the homestead for the station, and the shearers quarters are rented as permanent accommodation.

12 These buildings, and the site on which they sit has been gifted to the University of Otago to establish the proposed facility in 2016. The proposed facility will encompass the existing woolshed homestead and the surrounding area. The development will be nestled at the base of Jack's Point Hill, on the edge of Lake Wakatipu. The majority of the immediate area where the activities are proposed is gently sloping, gradually rising shores of Lake Wakatipu to the base of Jack's Point Hill. The north-western reaches of the site become steeper and more rugged, reaching further up Jack's Point Hill, and traversing into natural landscape classified as ONL in the PDP. No development is proposed within the ONL.

13 The woolshed homestead and surrounding buildings are clustered together to form a farm base typical of large stations in the region. The Jardine Woolshed was converted into a dwelling, and before being gifted to the University of Otago was occupied by the Jardine family. An expansive garden surrounds the woolshed homestead. Large established trees line the shores of Lake Wakatipu, sitting between the woolshed homestead and the beach. The trees provide shelter from the southerly wind and partially screen the woolshed homestead from those viewing Jack's Point Hill from Lake Wakatipu. A somewhat unkempt large productive garden takes up the area around

the buildings, in the form of raised beds, glasshouses, fruit trees, and a small vineyard that lie to the east of the woolshed homestead. Paths, courtyards, and hedging provide linear elements separating the large garden into sections. To the south and west of the woolshed homestead is a lawn area, sheltered by large established trees lining the perimeter to the south and west. Domestic activities are largely concentrated to the centre and south west of the site, leaving the eastern half of the site open and relatively unmaintained. The eastern half of the site is vegetated in predominantly exotic, wild grasses and shrubs with a scattering of fruit trees along the southern boundary.

14 Adjacent to the site is the current Jardine residence, as can be seen on Appendix 1. It is a large corrugated iron shed that has been converted into a dwelling.

15 Until now, no development has occurred within Homestead Bay although the OSR (south) has been subdivided into rural living lots (Nathanael Place), and road access to them (via Maori Jack Road and Homestead Bay Road) is established.

16 The shore of Lake Wakatipu is characterised by natural pebble beaches in this area. The width of the beach varies depending on the level of the lake and the topography. The beach is generally wide enough for members of the public to walk along the lakefront for the entire length of the site.

17 The site is accessed by Woolshed Road, which branches off Homestead Bay Road and Maori Jack Road. Maori Jack Road is the main entrance to Jack's Point and comes off State Highway 6 approximately six kilometres south of Frankton. Maori Jack Road and Homestead Bay Road are formed and sealed while the relevant part of Woolshed Road is formed as a gravel driveway. Several unformed dirt tracks leading to the lake and through the Homestead Bay area also come off Homestead Bay and Woolshed Roads.

18 In an overall sense, the site is a small section of the Homestead Bay development area (pursuant to both the ODP and PDP), with established residential development to the north (Jacks Point and Hanley's Farm), the Remarkables to the east, Lake Wakatipu and a broad rural landscape to the south and west. The site itself is tucked away under Jack's Point Hill. It contains several existing buildings associated with an established base for a large station and is domestic in character.

STATUTORY CONTEXT

19 The subject site (i.e. the area within which the proposed activities sit) is within the JPZ pursuant to both the ODP and the PDP. Pursuant to the ODP, the subject site is within the FBA. Pursuant to the PDP, the subject site and all proposed activities sit within the OSR – North.

20 A number of Environment Court appeals are unresolved in relation to the PDP JPZ. I understand that none of those appeals seek to change the zoning or Activity Area of the subject site. There are points of appeal that relate to some provisions of the OSR relating to required vegetation, but these are of relatively minor relevance in this case. Therefore, for this assessment, I have taken most guidance from the PDP provisions but have also given some consideration to the ODP.

21 Objective 41.2.1 is the overall Objective for the JPZ:

> *41.2.1 Objective - The establishment of an integrated community, incorporating residential living, visitor accommodation, community, and small-scale commercial activities with appropriate regard for landscape and visual amenity values, and within a framework of open space and recreation amenities.*

22 Many Policies sit under this Objective, the most relevant ones in this instance are:

- 41.2.1.1 that requires accordance with the Structure Plan of the JPZ;
- 41.2.1.7 that seeks to maintain a predominantly open and rural character for the JPZ when viewed from the lake;
- 41.2.1.8 that provides for a variety of living accommodation;
- 41.2.1.17 that provides for a commercial and mixed-use village at Homestead Bay, approximately 450m to the east of the subject site;
- 41.2.1.29 that provides for lakeside activities and low-density residential development in Homestead Bay.

23 The provisions then provide for 10 residential units within the northern OSR North Activity Area, within which the subject site sits (Rule 41.4.4.14). As well as the nearby village, the BFA sits close to the east of the subject site and provides for a breakwater, boat ramps, jetties, boat sheds, car parking, and associated public facilities.

24 In an overall sense, I consider that the OPD and PDP anticipate the lake frontage of Homestead Bay developing to include a boating facilities area on the water and foreshore itself with a sizable, dense, and vibrant village immediately on its landward side. Residential activities (at a low density) would then radiate outwards from the village, taking in the area of the subject site, with the location of the proposed activities sitting at the western end of this residential activity, where the steep and rugged ONL of Jack's Point Hill would form a book-end to the Homestead Bay development.

25 Within the JPZ, the specific area of Homestead Bay is unique in that it provides for development right down to and including the lake edge. Therefore, the vast majority of the JPZ presents an open and rural character to the lake.

PROPOSAL DESCRIPTION

26 The proposal is to convert the woolshed homestead and surrounding area into an academic retreat and conference facility for the University of Otago. The resource consent application includes extensive plans, elevations and images giving full details of the proposed activities. A site plan showing the proposed activities are attached as Appendix 1 to this report. The facility will include a number of different buildings (existing and proposed) to house a lecture theatre, meeting rooms, staff facilities, accommodation units, a commercial kitchen and other activities associated with the academic retreat and conference facility.

27 There are currently two buildings on site which are residential dwellings. These are the woolshed homestead and the shearer's quarters. The woolshed has been converted into a dwelling and was the primary residence for the Jardine family and now is currently empty. The woolshed homestead building will remain and will be converted to create a lodge type building which will operate as part of the proposed conference facility. The external appearance of the woolshed homestead will remain unaltered, only internal alternations are required to convert the building. The shearer's quarters also act as a residential unit which is currently rented. The shearers quarters are to be demolished to provide space for the construction of the proposed lecture theatre.

28 A new building to house the proposed lecture theatre will be constructed to the west of the woolshed. It will be a standalone building linked to the woolshed by a short covered walkway. The building will contain a lecture theatre, a commercial kitchen, a staff room, and associated facilities, a meeting room, server and AV rooms, storage areas, cloak cupboards, and toilet facilities. The lecture theatre is to be developed in two stages. The first stage will involve constructing a lecture theatre to accommodate 60 people and the second stage will see the lecture theatre double the

capacity to accommodate 120 people. Once completed the lecture theatre will cover an area of 706m^2 and be 8.39m at the highest point.

29 The lecture theatre building is to be predominantly clad in charred vertical shiplap cladding, with other areas clad in tightly stacked local schist and standing seam tray profile colorsteel (Colour G10 Flaxpod). The northern and southern walls will have large glass windows framing the views and providing a source of natural light. The glassed frontage on the southern (lake) side will open onto a covered wooden deck.

30 Visitor accommodation is also included in the proposal. The proposed visitors' accommodation is to be separate from the conference facility, located to the east of the existing woolshed homestead. 16 studio-style accommodation units, in five standalone buildings, will be constructed. Three of these buildings will be smaller and contain two studio rooms each, and two of these buildings will be larger and contain five studio rooms each. One of the larger accommodation buildings will also have a guest laundry, drying room, a cleaning supply room, and a plant room. There is to be a larger accessible unit (48m^2) within each building, the remaining units will be 33m^2 in area, and the total area of the visitor accommodation units as a whole is 629.5m^2. The two-unit blocks will be 10.5m by 8m, the five-unit blocks will be 23.47m by 8m and 27.6m by 8m. The height of the buildings due to the topography of the site and will range from 6.4 to 7.55m above ground level. The location of the proposed accommodation building can be seen on the layout plan attached as Appendix 1.

31 The accommodation buildings will have gable roofs to tie in with the peaks of the Remarkables to the east and existing buildings in the wider JPZ. The units will be clad in horizontal shiplap cladding (with sioux stain) and corrugated profile colorsteel (Colour G10 Flaxpod). The units will have an outdoor decking area providing views either to the lake (the 12 lakeshore units) or to the Remarkables (the four northern units).

32 A standalone three-bedroom residence is proposed for staff accommodation, located to the northeast of the woolshed homestead and lecture theatre. The proposed location is currently a small vineyard that will be removed to allow for construction. It is anticipated that a caretaker will be a full-time resident. The proposed dwelling will have a floor area of 121.5m^2. At its highest point, at the peak of the roof, the residential unit is 6.17m above ground level. Like the visitor accommodation units, the residential unit will be clad in horizontal shiplap cladding (with sioux

stain) and corrugated profile coloursteel (Colour G10 Flaxpod). A deck, with views across the lake, runs across the southern frontage of the building.

33 A new three-bay garage is to be constructed near the northern boundary in the centre of the site. The garage will be 9m by 8.9m triple with a maximum height of 4.85m. The garage will be used to store the University's minibus that will be used to transfer visitors using the site to and from other accommodation facilities and / or the airport. Consistent with other site buildings, the garage will be clad in corrugated profile coloursteel (Colour G10 Flaxpod).

34 A new bike garage and plant room is to be constructed behind the Hākitekura lecture theatre (i.e., immediately to the north). This 4.1m high and 50m^2 building will be built alongside a retaining structure on its northern side. The building will also be clad in corrugated profile coloursteel (Colour G10 Flaxpod)

35 A small solar farm is proposed to provide for the generation, storage and use of solar energy on the site. The solar farm will have up to 90m^2 of photo-voltaic cells (**PVC**). It is proposed that the panels will be placed on the ground and within the 'solar farm' area located behind the garage with an area for battery storage provided within the proposed triple bay garage. PVC panels may also be placed on the roofs of the visitor accommodation units. The location of the solar farm is shown on the site plan attached as Appendix 1.

36 Three separate car parking areas and a large garage will be provided onsite. One car parking area will be constructed on the eastern side of the site and will provide vehicle access to the accommodation units. The second car parking area is an existing parking area to be retained near the proposed caretaker's residence. The last car parking area is adjacent to the woolshed homestead and is also existing.

37 For the most part, the garden surrounding the woolshed homestead will be retained as is set out on the landscape plans that form part of the proposal. Where possible, the raised beds, greenhouses, and fruit trees will be retained in their current form and provide a productive and decorative function for the retreat facility. The proposed Hākitekura lecture theatre will be constructed on the lawn area to the west but the lawn area to the south is to be retained. It is envisaged that a caretaker or contactor will service the gardens and grounds. The intention is to retain the trees lining the foreshore. I note that a considerable area of the existing gardens is on the Crown foreshore land. The applicant does not have control over this land but has no intention to alter its current treatment. It appears particularly unlikely that LINZ or any other public entity

would seek to remove this existing vegetation. It does not impinge upon public access along the foreshore and it creates separation between the public land and the private area that accommodates the existing buildings.

38 Additional landscaping and native planting are proposed, as per the plans in Appendix 1 and that form part of the application. Clusters of trees and native vegetation are to be planted throughout the site. Paths will be constructed to provide a pedestrian link to different areas of the site and courtyards will be constructed to create outdoor spaces around the lecture theatre and accommodation units.

ASSESSMENT OF LANDSCAPE AND VISUAL EFFECTS

39 Landscape character effects are:

"… the effects of change and development on landscape as a resource. The concern here is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character." [5]

40 Visual effects are the effects that an activity may have on specific views and the general visual amenity experienced by people:

"*the effects of change and development on the views available to people and their visual amenity. The concern here is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements*".[6]

41 When describing effects, I will use the following hierarchy of adjectives:

- Very Low;
- Low;
- Moderate – Low;
- Moderate;
- Moderate – High;
- High;

[5] Landscape Institute and Institute of Environmental Management and Assessment Guidelines for Landscape and Visual Impact Assessment (3rd ed, Routledge, Oxford, 2013) at paragraph 5.1 and Glossary.
[6] Landscape Institute and Institute of Environmental Management and Assessment Guidelines for Landscape and Visual Impact Assessment (3rd ed, Routledge, Oxford, 2013) at paragraph 6.1 and Glossary.

- Very High. [7]

Effects on Landscape Character

42 I consider that the proposed activities will be sympathetic to both the existing and future anticipated landscape character in the area. In terms of the existing rural landscape character, the facility has been designed to utilise and preserve elements of the farm base, including the woolshed homestead structure, the established gardens, and mature trees throughout the site. In terms of the OSR landscape character anticipated in the PDP, there are potentially more built elements than one would expect in one cluster within the OSR activity area, bearing in mind that 10 dwellings are provided for within the OSR North (each one likely to include accessory buildings). However, the structure plan and OSR provisions do not specify that development cannot be clustered. The design and layout are sympathetic to the rural surroundings and aim to retain rural elements and open areas to ensure built form does not dominate the landscape. The Hākitekura lecture theatre, accommodation units, and staff residence will have the effect of adding built form to the site. However, much of the site will remain open in character, or vegetated by the existing gardens, and additional planting is proposed to help integrate new buildings and enhance the natural character of the site.

43 The Hākitekura lecture theatre is a relatively large building, however, in the context of the site it does not appear out of character. The proximity to the large existing woolshed homestead and screening provided by the mature trees allow the new Hākitekura lecture theatre to fit into the site, without detracting from the rural home base character. The proposed accommodation buildings are smaller in size but are located on the eastern side of the site which is unscreened open land. The exterior cladding and colour choices are designed to integrate with the backdrop of Jack's Point Hill and to stylistically tie all the buildings together. The shearers quarters are to be demolished and part of the site will become more open, although views through to these areas are limited. Overall, the built form on site will be increased but the landscape has the capacity to absorb these changes and they will have a low degree of adverse effects on existing landscape character, particularly when we consider potential outcomes that are fully provided for by the PDP provisions.

[7] ENV-2018-331-000019, 'Supplementary Statement of Evidence of Bridget Mary Gilbert for Queenstown Lakes District Council, Topic 2 – Rural Landscapes', dated 29 April 2019. This statement of evidence includes a guideline on landscape and visual effects assessment methodology that synthesises current professional practice. I agree with and adopt this guideline.

44 In terms of the future landscape character, the site is located on the outer edges of the Homestead Bay area in the JPZ. The character of this broader vicinity is anticipated to change quite dramatically as Homestead Bay is developed. The PDP allows for mixed-use development with a proposed marina and village centre located approximately 500m east of the proposed facility. The village centre will be a mix of apartments, waterfront eateries and retail. A mix of open space and lower density residential development will radiate out from the village centre. An open space activity area separates the village centre from the site.

45 The site sits with the OSR North activity area, in which 10 residential units are anticipated. As alluded to above, while large areas of open space are likely to be retained within the OSR, the PDP does not indicate how future residential units should be configured i.e. whether the 10 dwellings should be clustered or spread throughout the entire OSR. The proposed facility will be a cluster of buildings not dissimilar in character to a cluster of residential units. The proposed activities are not entirely residential in nature and therefore are perhaps something of a departure from exactly what the provisions envisage; although, in broad terms, it is not unusual for educational facilities to sit within areas of residential land use; this is the traditional location for such facilities.

46 Overall, I consider the adverse effects of the proposed facility on landscape character will be of a low degree, particularly as the Homestead Bay area is developed and the rural character is replaced with a relatively built up, mixed-use zone. Additionally, the natural and agricultural character of the upper reaches of Jacks Point Hill will be retained and adverse effects on the ONL will be of a very low degree.

Visual Catchment and Viewing Audiences

47 The areas from which the proposed activities are potentially visible include:

- The surface of Lake Wakatipu
- The adjacent area of lake foreshore
- State Highway 6
- The rural living properties of the OSR (south), being Chief Reko Road and Nathanael Place;
- The rural living properties of Lakeside Estate

- The rural living properties of Drift Bay Road and Vista Terrace

48 The relevant locations are shown on the Viewpoint and Context Plan that forms Appendix 2 to this report. Visual effects have not been assessed from land that is owned by the applicant or by the Jardine family, who have given written approval to the proposal.

Effects on Visual Amenity

The surface of Lake Wakatipu

49 The site has been a farm base for many decades. The existing structures and established vegetation are visible from Lake Wakatipu and suggest the site is used for domestic and agricultural purposes, although the screening and topography make it difficult for a viewer to identify individual structures and their uses. The existing buildings including the woolshed homestead are located on the western half of the site, screened by large existing trees. The exterior of the woolshed homestead is to remain unchanged. The eastern side of the site is currently relatively open, pastoral land.

50 The proposed academic retreat will lead to an increase in built form and landscaping on the site which will be partially visible from the surface of Lake Wakatipu. Photographs from representative viewpoints are attached as Appendix 3 to this report.

51 The largest structure will be the proposed Hākitekura lecture theatre which will be located to the west of the woolshed homestead. The fully developed Hākitekura lecture theatre will have a floor area of 706m^2 and has been designed such that the highest point (8.39m) is the northern side of the building, and the lowest point (5.9m) is the southern side, closest to the lake. The structure will be a similar height to the adjacent woolshed homestead. The existing vegetation will act to screen most of the building, but glimpse views may be obtained by people viewing the site from near the shore.

52 Many of the trees screening the western half of the site are deciduous so there is some seasonal variation in screening, in the winter the buildings will be more visible once the leaves have fallen.

53 The proposed accommodation units will be located to the east of the woolshed homestead in what is currently an open pastoral landscape. They will be visible from the surface of the lake. Building poles indicating the location of the proposed buildings are visible in photographs from Viewpoints 8-9, in Appendix 3, attached to this report. The exterior cladding materials and colours will

encourage the buildings to recede into the landscape. Additional native planting will offer some screening and soften the view of the buildings.

54 Similarly, the staff accommodation will be partially visible from parts of Lake Wakatipu. The three-bedroom house will be constructed from the same materials as the accommodation units which, as mentioned above, will help the building integrate with the surrounding landscape, create cohesion throughout the site and ensure adverse visual effects of a low degree.

55 The garage will be located within an area of existing vegetation and will be almost completely screened from view. The exterior will tie in with accommodation units and staff accommodation, tying in with the general aesthetic of the site.

56 The proposed solar farm will be located near the centre of the site. The solar farm will be 90m^2 and the panels will be at ground level. The solar farm will be located slightly further up the hill than the staff accommodation and some glimpse views may be available from Lake Wakatipu, but for the most part, the solar farm will be entirely screened by the existing and proposed buildings and vegetation. PVC panels are generally angled to catch northern sun and hence, even when visible, the actual PVC surface is likely to be angled such that it is not seen.

57 Those viewing the site from the surface of the lake in this area are generally recreating, and either fishing or doing water sports. As such, the views of the site from the surface of the lake will be from a distance, in the periphery, and glimpses. From these distances, the site is dwarfed by the views of Jack's Point Hill and the Remarkables in the background.

58 When viewed from a distance the facility will be a very small element within views of the wider landscape which are overwhelmingly natural with the lake in the foreground and a vast mountainous background. The use of recessive colours and materials will make the facility difficult to see and not significantly detracting in relation to the wider views. The new buildings will have a gable roof, allowing views through, and be recessive in colour to limit the visual impact. Over time the buildings will weather, the vegetation will mature, and the accommodation units will further recede into the background.

59 I consider that the adverse visual effects of the facility from Lake Wakatipu will be low initially and over time the adverse effects will become very low as the buildings weather, the vegetation grows, and Homestead Bay is developed. In this location and context, buildings are an anticipated part

of the environment. I do not see that the proposed design is particularly adverse in a visual sense when we consider outcomes that are enabled by the PDP provisions.

The adjacent area of lake foreshore

60 The shore of Lake Wakatipu adjacent to the site is public land which can be accessed by both boat and on foot. The existing and proposed buildings are both visible from this shore location. Vegetation between the shore and built form does partially screen the buildings and soften the visual impact. Additionally, this section of lakefront can only be accessed on foot or by boat, it is not on any defined route or trail and as such not frequented by the public on a regular basis.

61 Again, I consider that in the context of the existing activities (including residential use of the existing buildings) and the activities that are enabled by the relevant provisions, visual effects will be of a low degree. The amenity of a foreshore user will change slightly, but not in a way that is significantly adverse. This is particularly the case when we envisage the amenity experience that will be had by a foreshore user in the fullness of time; the lake-edge beach will be part of an occupied and relatively vibrant bay.

State Highway 6

62 The site is visible from State Highway 6 when travelling north along the stretch of road between Waterfall Creek and Drift Bay. The closest viewpoints on SH6 with views to the site are located approximately 4km from the facility. At this distance, the site is a very small and visually complex, lake-edge part of the wider landscape and will be barely noticeable to motorists. The lakes and the mountains very much dominate views and the colours and screening of the proposed building will make it very difficult to see the facility from such a distance. The undulating adjacent topography screens views of the site along the remainder of SH6.

63 The boating facility, village centre and OSR activity areas of Homestead Bay are located between SH6 and the site. It is anticipated that these areas will be developed and views across Homestead Bay to the site will evolve from a natural pastoral landscape (as it largely is today) to a relatively built-up area. The site of the activities themselves is currently very difficult to see from such a distance, however, as Homestead Bay is developed the site will become more screened and will be virtually impossible to distinguish from other built form within the site. As such, I consider the adverse visual effects of the proposal from SH6 will be very low at most.

The rural living properties of Drift Bay Road, Vista Terrace, Lakeside Estate and the OSR (South)

64 The visual effects on the rural living properties on Drift Bay Road, Vista Terrace, Lakeside Estate, and the OSR (South) will be similar to those from SH6. The site is a considerable distance from all these rural lifestyle areas. The OSR (south) is the closest, with building platforms ranging from approximately 700m – 1400m from the site. Lakeside Estate is approximately 2km southeast of the site and Drift Bay Road and Vista Terrace are more than 5km southeast of the site.

65 The topography and existing vegetation screen the site from a number of properties in the OSR (South) and Lakeside Estate. Properties on Drift Bay Road and Vista Terrace look across the lake to the site but from a distance of at least 5km. The site is barely visible from this distance, and views from these proprieties are dominated by natural landscapes, largely the lake and mountains. Any adverse visual effects as experienced from the established rural lifestyle properties are considered to very low, especially when compared to what is provided for by the zoning in Homestead Bay; ultimately a relatively visually-busy lake edge will be present within Homestead Bay with considerable built form visible. The proposed activities will very much recede in this visual context.

Overall Visual Effects

66 Overall, I consider the adverse visual effects of the proposed facility will be of a low degree. The facility will be in a discrete location at the base of Jack's Point Hill, and proposed structures have been designed to be sympathetic to the surrounding landscape to minimise adverse visual effects. As mentioned above, the Homestead Bay area will ultimately be developed and the open rural landscape replaced with an occupied, mixed-use zone. The proposed facility will be a much smaller scale development than the village centre and marina areas that are provided for in the ODP and PDP and in the future will be prominent elements in lake front views of Homestead Bay.

EVALUATION AGAINST RELEVANT STATUTORY CONTEXT AND CONCLUSIONS

67 It is my understanding that the proposed activity requires a non-complying resource consent as it is not consistent with the Jacks Point Structure Plan and the buildings exceed the maximum height of four metres.

68 However, the proposal will contribute to the integrated community envisaged by Objective 41.2.1 and creates a unique opportunity to add an academic element to Homestead Bay. The location of

the facility is considered appropriate as it is outside the ONL and development is anticipated along the lakefront in Homestead Bay. Policy 41.2.1.29 provides for lakeside activities and low-density residential development in Homestead Bay. Furthermore, the site will be located approximately 450m from the village and marina activity areas that provides for a sizeable mixed-use development that will shift the landscape from an entirely open, rural landscape to a mix of built-up areas and open space.

69 The unassuming design ensures the facility fits comfortably into the existing rural landscape as well as the future mixed-use development anticipated in Homestead Bay. Structures will be concentrated in the lower, less conspicuous areas of the site with the western half of the site, within the ONL, retained as rugged rural landscape. The proposed architecture celebrates and builds on the existing buildings.

70 Additionally, the site sits between the OSG and the OSF which are to be retained as open space ensuring the open rural character of the site and surrounding area is retained.

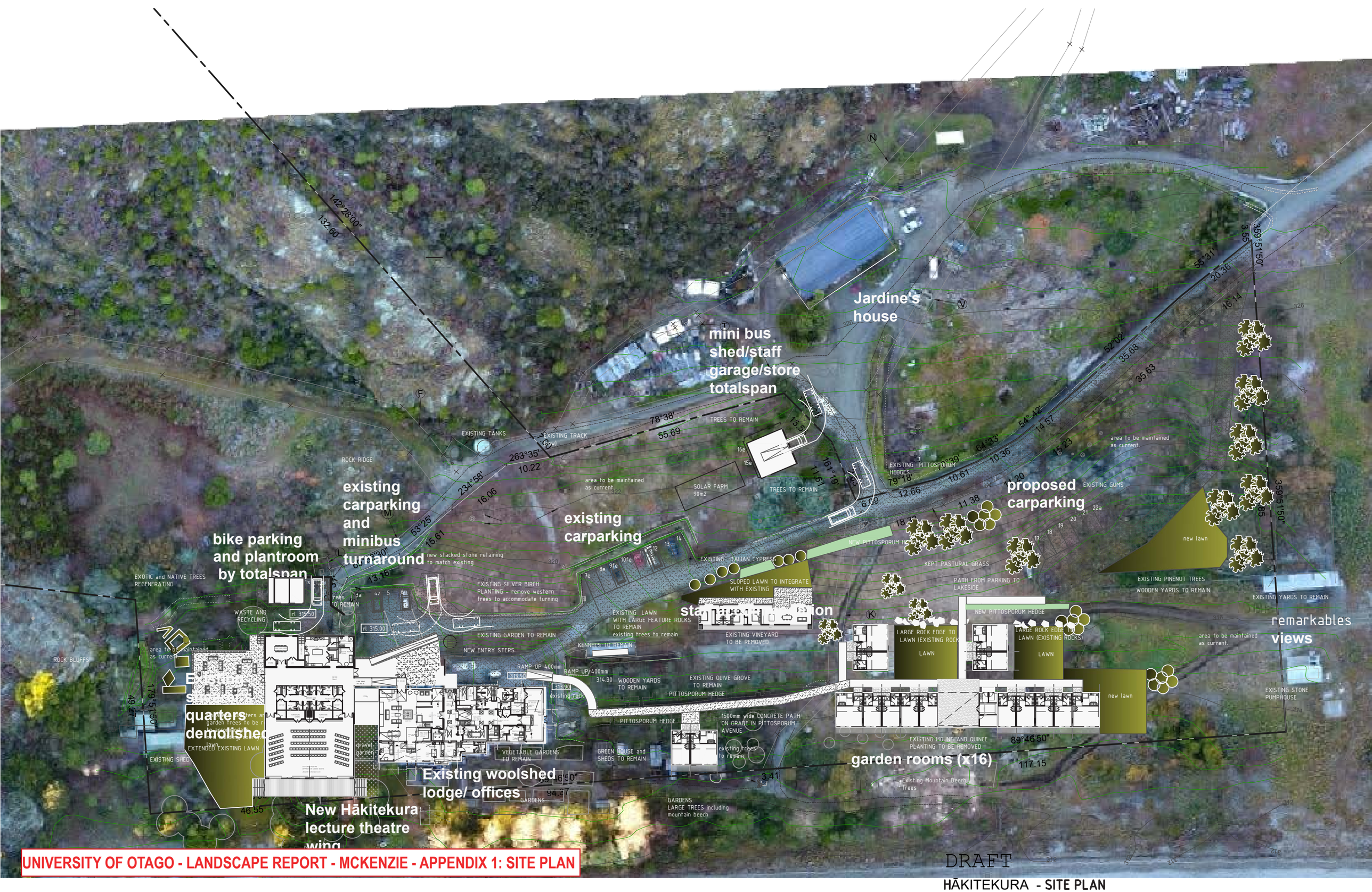
71 In an overall sense, the proposed activity will add an academic element to Homestead Bay, in an area that has had farm-related domestication for many decades. The facility will fit comfortably within the existing rural landscape and the landscape envisaged for Homestead by the zone previsions in the ODP and PDP. The location of the site and proposed mitigation measures ensure the and adverse visual effects will be low.

Jessica McKenzie

Landscape Architect

vivian+espie

9th June 2020



UNIVERSITY OF OTAGO - LANDSCAPE REPORT - MCKENZIE - APPENDIX 1: SITE PLAN

HĀKITEKURA - SITE PLAN

notes:
1. Copyright belongs to Kerr Ritchie Ltd
2. All work to be in accordance with NZS3604, NZS 4229, NZBC
3. Do not scale from drawings. All dimensions govern.
4. Alterations to the drawings must be notified to the Architect in writing.

Hakitekura, Queenstown for University of Otago

>>> po box 1894 queenstown 9348 new zealand **TEL** +64 3 441 4513 **EMAIL** bronwen@kerrritchie.com **WEBSITE** www.kerrritchie.com >>>

kerr>>ritchie
>>> ARCHITECTURE >> LANDSCAPE >>>

series: Developed Design

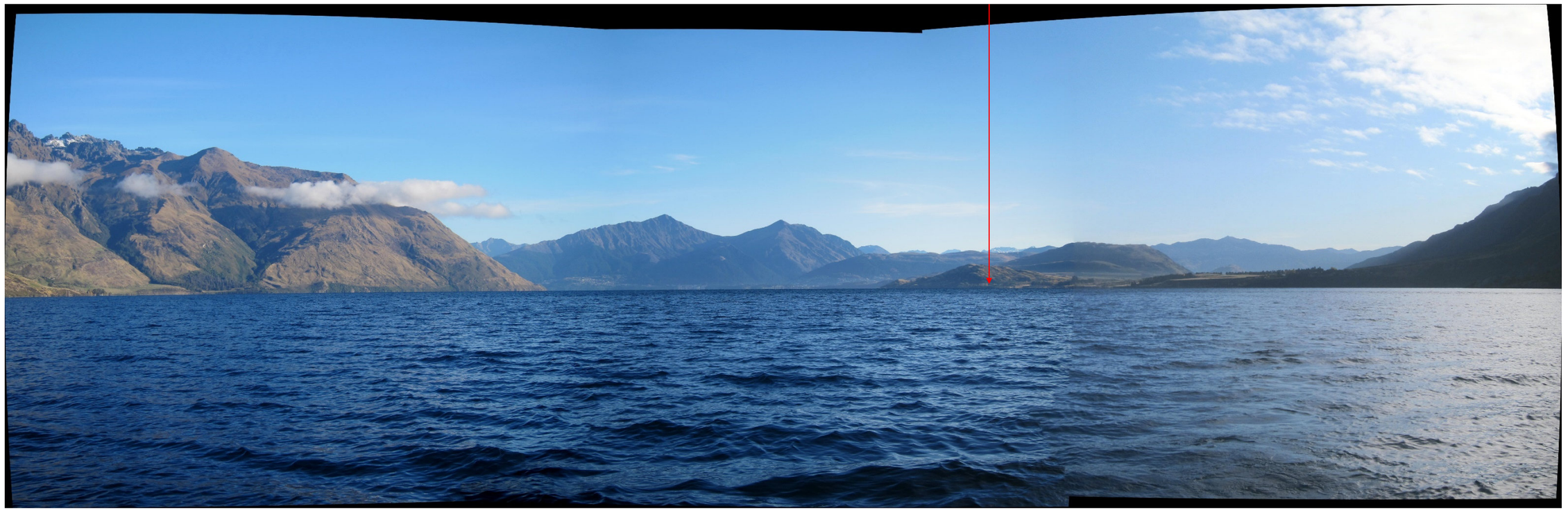
job:	390
date:	06.04.20
drawn:	pr/bk
scale:	1:750
drawing no.:	10-02

UNIVERSITY OF OTAGO - LANDSCAPE REPORT - MCKENZIE - APPENDIX 2 - CONTEXT AND VIEWPOINT MAP

REF: 1603-01
DATE: 03.06.2020
SCALE: 1:30,000 @ A3

Context and Viewpoint Map
Homestead Bay, Queenstown

vivian+espie
resource management and landscape planning
vivian+espie Limited Resource Management and Landscape Planning
PO Box 2514
Physical Address 1/211B Glenda Drive Frankton, Queenstown
Tel +64 3 441 4189 **Fax** +64 3 441 4190 **Web** www.vivianespie.co.nz



Viewpoint 1 – Looking north from Lake Wakatipu, opposite the mouth of Wye Creek.

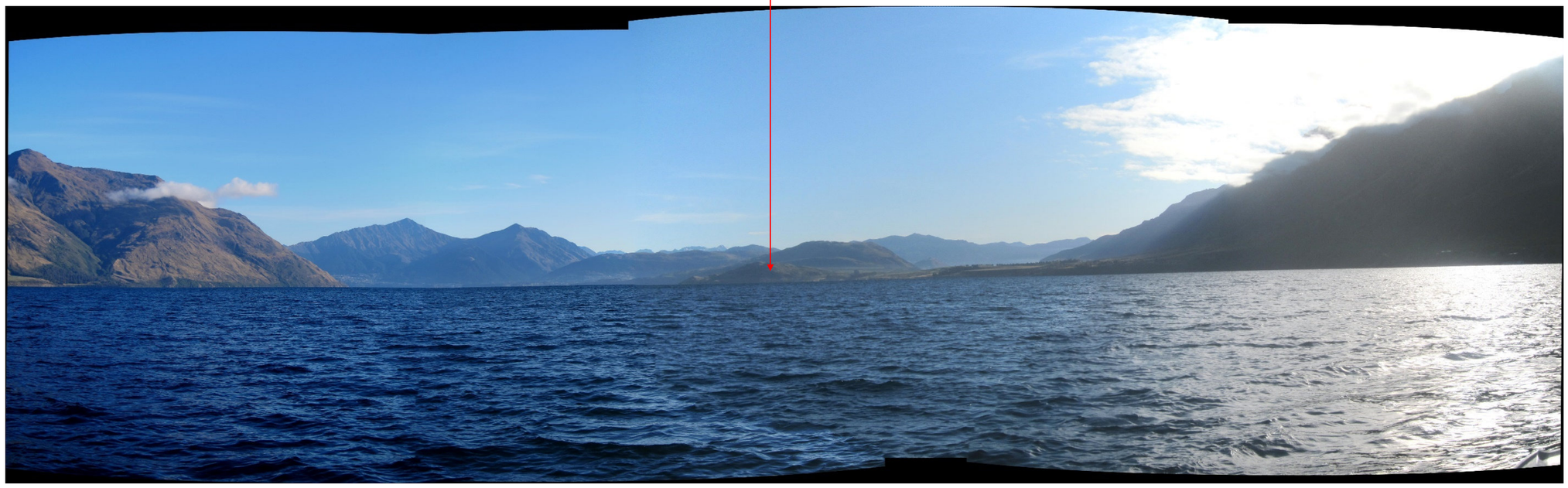
UNIVERSITY OF OTAGO - LANDSCAPE REPORT - MCKENZIE - APPENDIX 3: PHOTOGRAPHS

All photographs were taken with a fixed focal length of 50mm. Photographs are intended to illustrate points made in this report. If this sheet is printed at A3 size, the photographs are not at full size so as to replicate the full-scale field of view as taken in by the human eye. A red arrow indicates the location of the proposed buildings.

Viewpoint 2 – Looking north from Lake Wakatipu, below Wye Creek.

UNIVERSITY OF OTAGO - LANDSCAPE REPORT - MCKENZIE - APPENDIX 3: PHOTOGRAPHS

All photographs were taken with a fixed focal length of 50mm. Photographs are intended to illustrate points made in this report. If this sheet is printed at A3 size, the photographs are not at full size so as to replicate the full-scale field of view as taken in by the human eye



Viewpoint 3 – Looking north from Lake Wakatipu, opposite below Wye Creek.

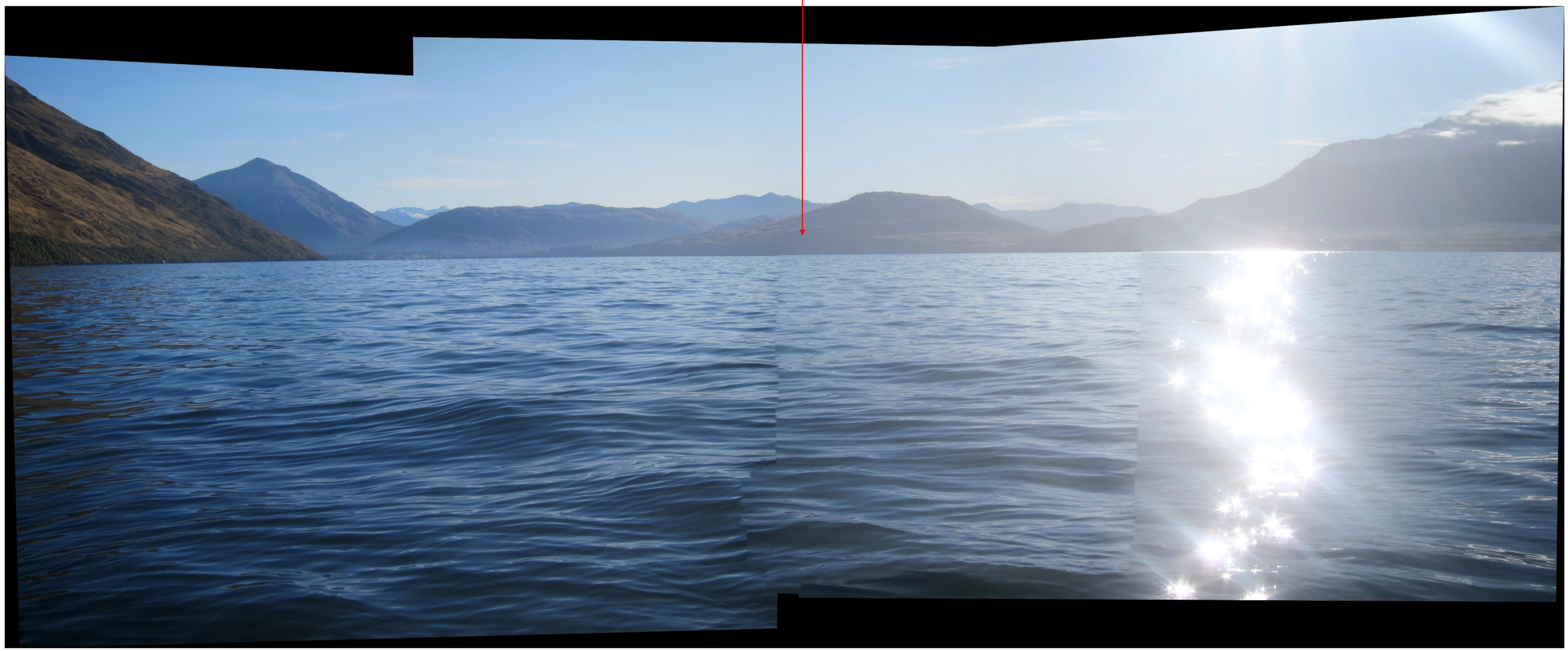
UNIVERSITY OF OTAGO - LANDSCAPE REPORT - MCKENZIE - APPENDIX 3: PHOTOGRAPHS

All photographs were taken with a fixed focal length of 50mm. Photographs are intended to illustrate points made in this report. If this sheet is printed at A3 size, the photographs are not at full size so as to replicate the full-scale field of view as taken in by the human eye

Viewpoint 4 – Looking north from Lake Wakatipu, opposite the Drift Bay development

UNIVERSITY OF OTAGO - LANDSCAPE REPORT - MCKENZIE - APPENDIX 3: PHOTOGRAPHS

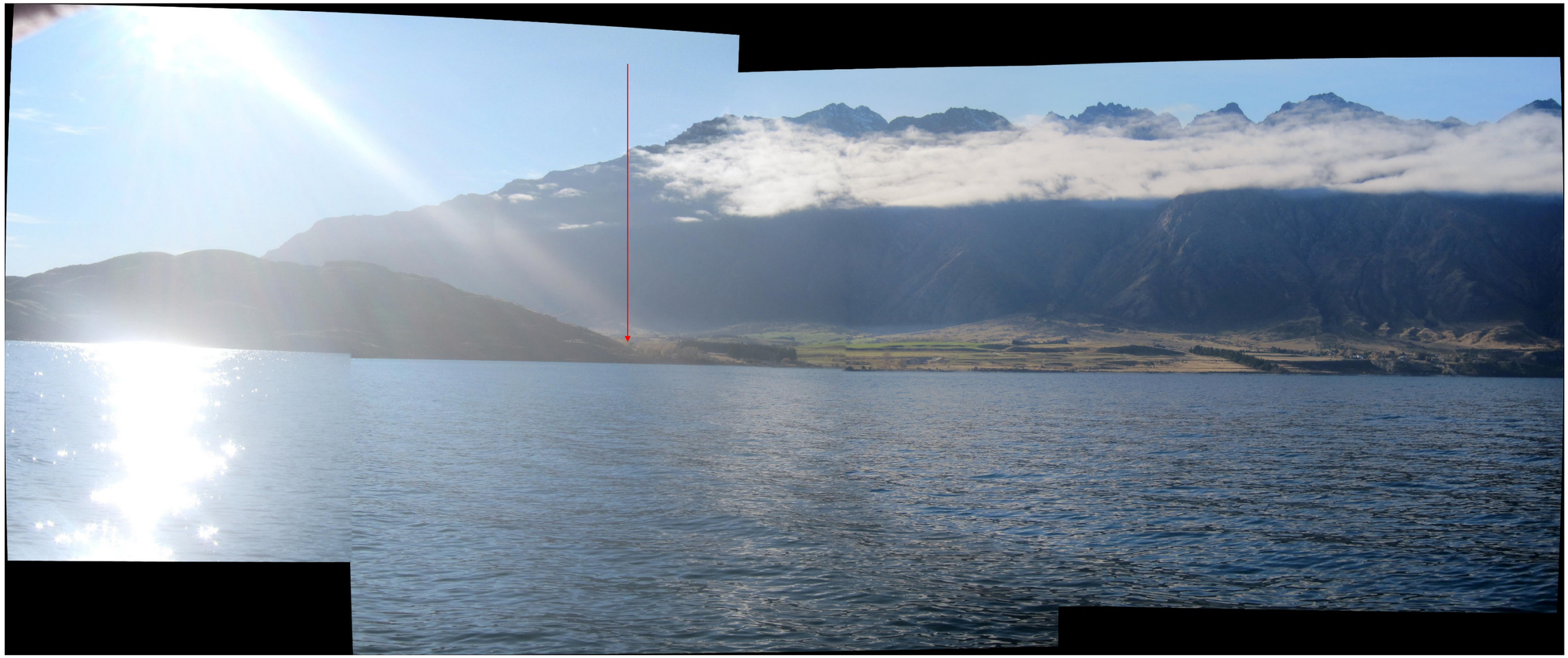
All photographs were taken with a fixed focal length of 50mm. Photographs are intended to illustrate points made in this report. If this sheet is printed at A3 size, the photographs are not at full size so as to replicate the full-scale field of view as taken in by the human eye



Viewpoint 5 – Looking northeast from Lake Wakatipu, from near the Cecil Peak wharf.

UNIVERSITY OF OTAGO - LANDSCAPE REPORT - MCKENZIE - APPENDIX 3: PHOTOGRAPHS

All photographs were taken with a fixed focal length of 50mm. Photographs are intended to illustrate points made in this report. If this sheet is printed at A3 size, the photographs are not at full size so as to replicate the full-scale field of view as taken in by the human eye



Viewpoint 6 – Looking east from Lake Wakatipu, opposite the site.

UNIVERSITY OF OTAGO - LANDSCAPE REPORT - MCKENZIE - APPENDIX 3: PHOTOGRAPHS

All photographs were taken with a fixed focal length of 50mm. Photographs are intended to illustrate points made in this report. If this sheet is printed at A3 size, the photographs are not at full size so as to replicate the full-scale field of view as taken in by the human eye

Viewpoint 7 – Looking east from Lake Wakatipu, opposite the site.

UNIVERSITY OF OTAGO - LANDSCAPE REPORT - MCKENZIE - APPENDIX 3: PHOTOGRAPHS

All photographs were taken with a fixed focal length of 50mm. Photographs are intended to illustrate points made in this report. If this sheet is printed at A3 size, the photographs are not at full size so as to replicate the full-scale field of view as taken in by the human eye

Viewpoint 8 – Looking north from Lake Wakatipu, opposite the site.

UNIVERSITY OF OTAGO - LANDSCAPE REPORT - MCKENZIE - APPENDIX 3: PHOTOGRAPHS

All photographs were taken with a fixed focal length of 50mm. Photographs are intended to illustrate points made in this report. If this sheet is printed at A3 size, the photographs are not at full size so as to replicate the full-scale field of view as taken in by the human eye

Viewpoint 9 – Looking north from Lake Wakatipu, opposite Homestead Bay.

UNIVERSITY OF OTAGO - LANDSCAPE REPORT - MCKENZIE – APPENDIX 3: PHOTOGRAPHS

All photographs were taken with a fixed focal length of 50mm. Photographs are intended to illustrate points made in this report. If this sheet is printed at A3 size, the photographs are not at full size so as to replicate the full-scale field of view as taken in by the human eye

APPENDIX 8:

Archaeological Assessment

Origin Consultants, March 2020

HAKITEKURA/WOOLSHED BAY, QUEENSTOWN

Archaeological Assessment
March 2020

Origin
CONSULTANTS

Archaeological Assessment for Hakitekura/Woolshed Bay

Archaeological Sites: F41/843

Commissioned by the University of Otago

Prepared by Benjamin Teele

Origin Consultants Ltd

March 2020

Photograph of the woolshed and stockyards at Hakitekura/Woolshed Bay (scanned from Shadows on the Hill by Jardine)

Contents

List of Figures

Introduction

This archaeological assessment has been prepared for the University of Otago for the proposed construction of a new academic retreat and conference facility located at Hakitekura/Woolshed Bay (Figure 1-Figure 2). Concept plans prepared by Kerr Ritchie show the conversion of the existing woolshed building (now a domestic residence) into a lodge with offices, and the addition of a lecture wing to the western elevation. The existing shearers' quarters building will be demolished, and a new wing consisting of visitor and staff accommodation built to the east. The concept design shows an expansion to the current carparking area and planting areas.

The legal description of the site

- Lot 1 Deposited Plan 452315
- Lot 3 Deposited Plan 452315

The site is not listed in QLDC's Operative or Proposed District Plan nor on Heritage New Zealand's The List.

A resource consent application is currently being prepared for the site. Because the building is not listed under the District Plan no heritage impact assessment is required.

The assessment site covers two irregular shaped parcels of land located adjacent to the lake waterfront. Its southern boundary is defined by the lake shore. Access is via a private drive from the northeast, which also runs past a modern residential dwelling located to the north. The site under assessment is well known as the location of the historic woolshed which was used as part of the Kawarau Falls Station in the 19th and 20th centuries.

The purpose of this assessment is to identify what archaeological remains may be affected by the proposed development of a new academic retreat and conference facility for the University of Otago. This will determine whether an Archaeological Authority Application is required under the Heritage New Zealand Pouhere Taonga Act 2014, and if so, provide appropriate recommendations for the mitigation and management of any archaeological material encountered. The author of this report is Benjamin Teele, Principal Archaeologist at Origin Consultants Ltd and a member of the New Zealand Archaeological Association.

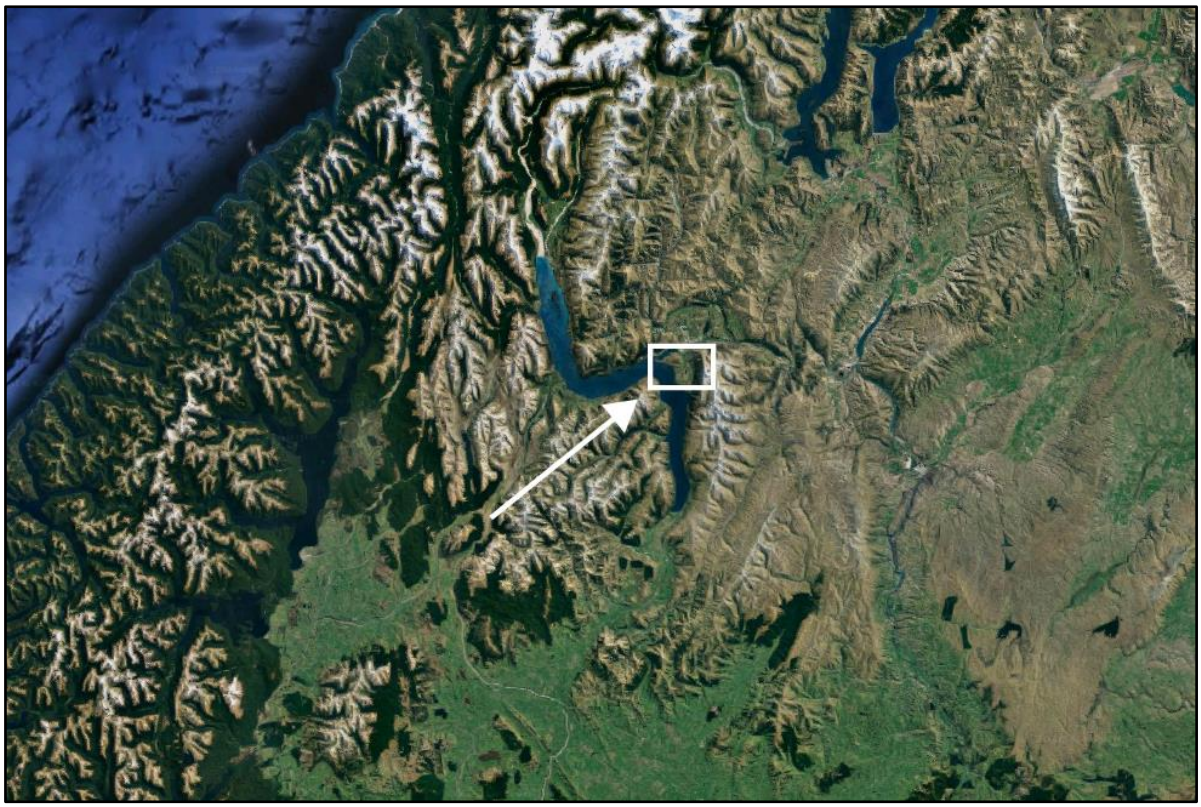


Figure 1. Location of site within Otago adjacent to Lake Wakatipu (Google Earth).

Figure 2. Location of Hakitekura/Woolshed Bay near Jacks Point, Queenstown (QLDC ArchGIS).

Statutory Requirements

There are two main pieces of legislation in New Zealand that control work affecting archaeological sites. These are the Heritage New Zealand Pouhere Taonga Act 2014 ('HNZPT Act 2014') and the Resource Management Act 1991 (RMA).

Heritage New Zealand Pouhere Taonga ('HNZPT') administers the HNZPT Act 2014. The Act contains a consent (authority) process for any work affecting archaeological sites, where an archaeological site is defined as:

> (a) any place in New Zealand, including any building or structure (or part of a building or structure), that --:
>
> (i) Was associated with human activity that occurred before 1900 or is the site of the wreck of any vessel where the wreck occurred before 1900; and
>
> (ii) Provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand; and
>
> (iii) Includes a site for which a declaration is made under section 43(1)

Any persons who intend carrying out work that may damage, modify or destroy an archaeological site, or to investigate a site using invasive archaeological techniques, must first obtain an authority from HNZPT. The process applies to sites on land of all tenure including public, private and designated land. The HNZPT Act 2014 contains penalties for unauthorised site damage or destruction.

The archaeological authority process applies to all sites that fit the HNZPT Act 2014 definition, regardless of whether:

- The site is recorded in the NZ Archaeological Association Site Recording Scheme or registered by HNZPT,
- The site only becomes known about as a result of ground disturbance, and/ or
- The activity is permitted under a district or regional plan, or a resource or building consent has been granted.

Once an authority has been granted, modification of an archaeological site is only allowed following the expiration of the appeals period or after the Environment Court determines any appeals. Any directly affected party has the right to appeal the decision within 15 working days of receiving notice of the determination. HNZPT may impose conditions on the authority that must be adhered to by the authority holder (Section 52). Provision exists for a review of the conditions (see Section 53). The authority remains current for a period of up to 35 years, as specified in the authority. If no period is specified in the authority, it remains current for a period of five years from the commencement date.

The authority is tied to the land for which it applies, regardless of changes in the ownership of the land. Prior to any changes of ownership, the landowner must give notice to HNZPT and advise the succeeding landowner of the authority, its conditions, and terms of consent.

HNZPT also maintains the List of Historic Places, Historic Areas, Wahi Tapu and Wahi Tapu Areas. The List can include archaeological sites. The purpose of the List is to inform members of the public about such places and to assist with their protection under the Resource Management Act (1991).

The RMA requires City, District and Regional Councils to manage the use, development, and protection of natural and physical resources in a way that provides for the wellbeing of today's communities while safeguarding the options of future generations. The protection of historic heritage from inappropriate subdivision, use, and development is identified as a matter of national importance (section 6f).

Historic heritage is defined as those natural and physical resources that contribute to an understanding and appreciation of New Zealand's history and cultures, derived from archaeological, architectural, cultural, historic, scientific, or technological qualities.

Historic heritage includes:

- historic sites, structures, places, and areas;
- archaeological sites;
- sites of significance to Māori, including wahi tapu;
- surroundings associated with the natural and physical resources (RMA section 2).

These categories are not mutually exclusive and some archaeological sites may include above ground structures or may also be places that are of significance to Māori.

Where resource consent is required for any activity the assessment of effects is required to address cultural and historic heritage matters (RMA 4th Schedule and the District Plan assessment criteria).

Methodology

An archaeological assessment is required to accompany an application for an archaeological authority, as stipulated in the Heritage New Zealand Pouhere Taonga Act (2014). The archaeological assessment for this site was carried out using desk-top research methods and included a site visit to assess any current standing structures and site features.

The desk-top assessment methodology consulted a wide range of archival sources to try to establish and clarify the historical development and chronology of the site and its heritage values. The assessment used the following types of sources to trace the history of the area around Woolshed Bay, Lake Wakatipu.

- 19th century surveyors' maps and section subdivision maps;
- Land titles and land transfer surveys (LINZ);
- Photographic and documentary archives (Hocken Library, Dunedin City Library Heritage Collections, family photograph albums, on-line archive repositories - Archives NZ, DigitalNZ, Hocken Library, National Library of NZ, Museum of New Zealand/Te Papa Tongarewa; PapersPast, Appendix to the Journal of the House of Representatives);
- Local histories and similar publications;
- NZAA ArchSite.

The site visit was undertaken to make a visual assessment which included an appraisal of:

- The approximate age and architectural style of any extant structures on the site.
- The environs within the site including spatial usage such as recent earthworks, topography, vegetation and any ground-level features of heritage relevance.

The visual assessment was supported by digital photographs that recorded the features of the site. The site visit was undertaken on the 16th of March 2020 by Benjamin Teele.

Physical Environment or Setting

The site is located adjacent to the Wakatipu lakeshore, south of the Jacks Point residential development. The site is situated on a relatively flat glacial plain, with the Remarkable mountain range to the east, and Lake Wakatipu to the west. The area contains several farm buildings of various sizes and dates of construction. Access is via a gravel road that winds down towards the lake. Historically, the site was the focus of pastoral farming activity, mostly around shearing of large numbers of sheep. More recent development has seen the

site shifted to residential use. As a result, the site is now covered in extensive gardens and landscaped elements. The southwestern boundary of the site is defined by a strip of gravel beach facing onto the lake.

Historical Background to the Assessment Area

Māori Settlement

The earliest human occupation of the South Island and Otago region is considered to be by Polynesian settlers dating from around 1280AD who quickly spread across the region, developing different types of settlement sites dependent on the available local resources and environmental conditions (Wilmshurst, Anderson, Higham, & Worthy, 2008). These included settled village sites along the coast adjacent to rich and sustained food resources such as seals and moa; seasonal inland sites for collecting stone resources and hunting; and comparable seasonal coastal sites for 'fishing and moa processing' (Hamel, 2001). Such settlement and utilisation of the abundant resources was not without its impacts however, with much of the forest along the coastal region reduced in extent, changes in patterns of hunting and fishing, and the use of smaller, more mobile occupation sites by the 16th and 17th centuries. This was followed by further changes in subsistence, based on organised food gathering and processing that created settled village communities along the Otago coastline from the mid-18th century onwards (Hamel, 2001).

The importance of Lake Wakatipu and the wider area as a place to gather food and other resources is identified in the oral histories of the area. The Ngai Tahu settlement document outlines some of the Māori history of the lake and Whakatipu basin.

> "The name 'Whakatipu-wai-maori' originates from the earliest expedition of discovery made many generations ago by the tupuna Rakaihautu and his party of the Uruao waka. Rakaihautu is traditionally credited with creating the great waterways of the interior of the island with his famous ko (a tool similar to a spade), known as Tu Whakaroria (renamed Tuhiraki at the conclusion of the expedition).[1]
>
> Whakatipu-wai-maori once supported nohoanga and villages which were the seasonal destinations of Otago and Murihiku (Southland) whanau and hapu for many generations, exercising ahi ka and accessing mahinga kai and providing a route to access the treasured pounamu located beyond the head of the lake. Strategic marriages between hapu strengthened the kupenga (net) of whakapapa and thus rights to use the resources of the lake. It is because of these patterns of activity that the lake continues to be important to runanga located in Murihiku, Otago and beyond. These runanga carry the responsibilities of kaitiaki in relation to the Area, and are represented by the tribal structure, Te Runanga o Ngai Tahu.
>
> The lake also supported permanent settlements, such as the kaika (village) Tahuna near present-day Queenstown, Te Kirikiri Pa, located where the Queenstown gardens are found today, a Ngati Mamoe kaika near the Kawarau Falls called O Te Roto, and another called Takerehaka near Kingston. The Ngati Mamoe chief Tu Wiri Roa had a daughter, Haki Te Kura, who is remembered for her feat of swimming across the lake from Tahuna, a distance of some three kilometres.
>
> The tupuna had considerable knowledge of whakapapa, traditional trails and tauranga waka, places for gathering kai and other taonga, ways in which to use the resources of the lake, the relationship of people with the lake and their dependence on it and tikanga for the proper and sustainable utilisation of resources. All of these values remain important to Ngai Tahu today.
>
> A key attraction of the lake was the access it provided to seasonal campsites and the pounamu located at the head of the lake at the Dart and Routeburn River catchments, from which countless generations gathered inaka and koko-takiwai pounamu and transported it back to coastal settlements for fashioning into tools, ornaments and weapons.

[1] Ngai Tahu Settlement 16 October 1998 - Deed of recognition for Whakatipu-Wai-Maori (Lake Wakatipu).

> Waka and mokihi were the key modes of transport for the pounamu trade, travelling the length and breath of Whakatipu-wai-maori. Thus there were numerous tauranga waka (landing places) on the lake and the islands upon it (Matau and Wawahi-waka). The tupuna had an intimate knowledge of navigation, river routes, safe harbours and landing places, and the locations of food and other resources on the lake. The lake was an integral part of a network of trails which were used in order to ensure the safest journey and incorporated locations along the way that were identified for activities including camping overnight and gathering kai. Knowledge of these trails continue to be held by whanau and hapu and are regarded as taonga. The traditional mobile lifestyle of the people led to their dependence on the resources of the roto (lake).
>
> Whakatipu-wai-maori is an important source of freshwater, the lake itself being fed by hukawai (melt waters). These are waters with the highest level of purity and were accorded traditional classifications by Ngai Tahu that recognised this value. Thus it is a puna (spring) which sustains many ecosystems important to Ngai Tahu. The mauri of Wakatipu-wai-maori represents the essence that binds the physical and spiritual elements of all things together, generating and upholding all life. All elements of the natural environment possess a life force, and all forms of life are related. Mauri is a critical element of the spiritual relationship of Ngai Tahu Whanui with the lake.

Anderson describes the occupation of by different iwi of the interior of Otago in more detail.

> The traditions indicate that at the beginning of the 18th century, Waitaha and Ngatimamoe occupied settlements concentrated around the western lakes; Waitaha mainly at Ohau, Wanaka, Te Anau and Manapouri and Ngatimamoe in the Wakatipu district in particular. The conflicts between these groups, and within them, were turned into a three-way contest by the arrival of Ngaitahu. Waitaha, not as closely related to the other two groups as these were to each other, and seeming always to be victims rather than aggressors, were compelled to abandon the MacKenzie country and Wanaka by about 1720, and were driven from their last interior settlements in the south-west barely a generation later. Ngatimamoe, after the first Ngaitahu raids, retained a tenuous grip on Ohau and the Queenstown settlements, but by the mid-18th century seem to have retreated to areas south of Wakatipu. It is impossible to be more emphatic or precise about the course of events because of the uncertainties introduced by variations in the ascription of individuals to tribal groups, and of attributions of events to settlements. Moreover, given mobility in settlement patterns (below), the lack of a traditional encounter at any particular settlement need not mean that it had already been abandoned, only that it was empty when it came to the attention of a raiding party. But, despite these problems, it seems quite clear that Waitaha and Ngatimamoe had abandoned the interior as far south as Wakatipu by about 1780 (Anderson, 1982).

Based on previous assessments of the area and the known location of archaeological sites, it is unlikely that the area around Woolshed Bay was used intensively by Māori due to its exposed nature from winds across the lake. Communication and travel across Lake Wakatipu would have been by waka, as much of the eastern shoreline was too rugged to allow easy traverse by foot. It is possible that the long gravel beach provided an area to land a waka, and may have been used as such. However, such activity if it occurred would have been unlikely to provide any substantial archaeological deposits. There are no archaeologically recorded Māori sites in the area, and the previous landowner, Dick Jardine, had found no evidence of Māori activity within his farm according to a previous archaeological report (Petchey, 2001). The extensive disruption from a number of industries to the wider area following European settlement would have likely removed many of the earlier traces of Māori use and occupation of the Wakatipu Basin. Therefore, the small number of recorded archaeological sites in the wider area do not accurately represent the extent of Kāi Tahu association within the Basin.

The Kā Huru Manu atlas has no identified points of interest near the site. To the north, Nuku-o-Hakitekura (The Expanse of Hakitekura) is the Māori name for the Kelvin Peninsula on the shore of Whakatipu Waimāori (Lake

Wakatipu). Ōterotu is the traditional Māori name for the Kawarau Falls and is located at the outlet of Whakatipu Waimāori (Lake Wakatipu).

European Settlement

The first European to explore the Wakatipu Basin was Nathanial Chalmers in September 1853. He was guided by a Maori chief, Reko, from Southland, up the Mataura River, crossing the 'Natural Bridge' over the Kawarau. He made it as far as Clutha at Lake Hawea, before becoming too ill to travel. They travelled back to the coast by way of rivers using a mokihi (flax raft). By the end of the 1850s European pastoralists had begun to stake out claims to various runs in the area, taking up the depasturing licences on offer. This initial settlement was quickly followed by the Otago goldrushes of the early 1860s, which brought large numbers of miners to the area.

Queenstown was founded by William Rees, a pastoralist, when he settled here in 1860. Rees established a vast sheep station over the areas of Queenstown and Frankton. His first homestead was built on the water's edge on Queenstown Bay, approximately where Marine Parade now runs (Lake Wakatip Mail, 1873a).

The subsequent influx of miners into the Wakatipu forced W. G. Rees to abandon his home station in Queenstown Bay when the government stripped him of his pre-emptive right to the land; this precipitated his move to Kawarau Falls and the foundation of a homestead there.

The land at Hanley Downs was originally part of Run 331, "Staircase Run", and was initially applied for in 1859 by D. and A. Cameron. With a Maori guide known as "Sandfly", they attempted to reach the Wakatipu. They made it as far as Wye Creek (Lumberbox) before turning back. After a shipment of sheep from Australia was lost, the run was subsequently transferred to John McIntosh and Angus MacDonald, who quickly sold it to Rees and his partners (Beattie, 1979: 346).

This run, combined with Run 345, "Peninsula", and Runs 346 and 356 were part of the original Rees Falls Station, which was renamed Kawarau Falls Station (Jardine, 1978). Part of this station was surveyed as the Coneburn District in 1866.

Previous Archaeological Work

An archaeological assessment to the north of the site was produced by Peter Petchey in 2001 (Petchey, 2001). This was undertaken for the recent Jacks Point development. Petchey did not identify any archaeological or historic sites during his site visit and discussion with the landowner.

In 2014 the timber stable that forms part of a collection of central farm buildings for the Kawarau Falls Station (F41/759) was burnt down without an authority from Heritage New Zealand. An archaeological assessment was prepared after the fact in order for an authority to be issued to deal with the remains of the building (2015/1224)(Teele, 2015). This assessment identified the buildings on site as being built during the Boyes Brothers ownership of the station, sometime between 1866 and 1886. It also identified the possibility of additional service buildings having been built in the area, including a smithy and cookshop. The remains of the stable floor, constructed of cobble stones and an early cement ring beam foundation, was recorded and then covered. The stable building was determined to be contemporary with the adjacent men's quarters.

Further archaeological work was undertaken in November 2016 focused on the Hanley Downs residential development (Benjamin Teele, 2016). This involved further investigation of the Men's Quarters building prior to its demolition.

Further investigations of the Kawarau Falls Station have recently been undertaken around the homestead area adjacent to Lake Wakatipu and the Kawarau Falls Dam Bridge (F41/567). This investigation determined that there were three extant buildings associated with 19th century occupation of the station. In addition, historic research showed that extensive modifications were undertaken to homestead buildings after the station was acquired by the Boyes brothers. These works appear to have occurred during the early 1870s and may be an indication of wider station works that were occurring at this time, including the possible construction of the buildings at Hanley Downs.

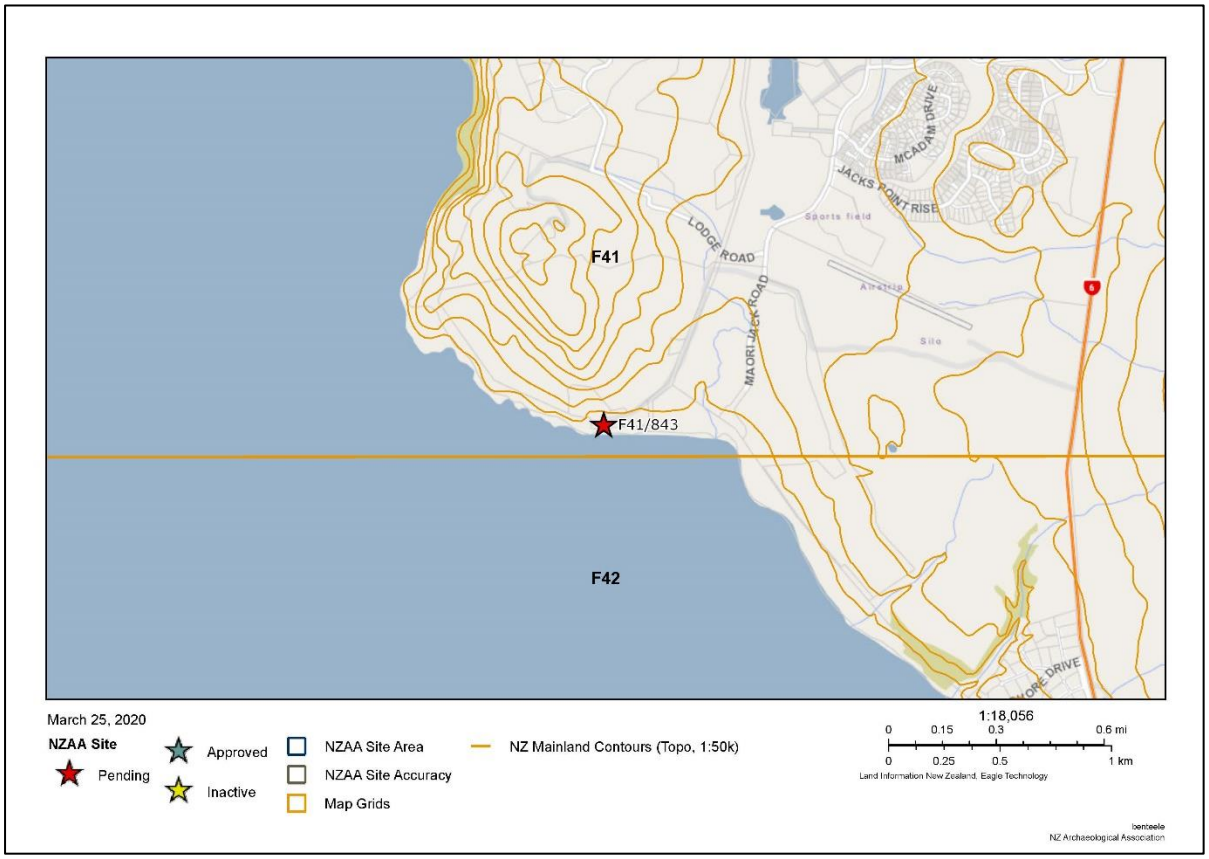


Figure 3. Map showing location of F41/843 at Woolshed Bay (ArchSite 2020).

Constraints and Limitations

The key constraints and limitations on the archaeological assessment for the Hakitekura/Woolshed Bay site are as follows:

- This assessment is based upon desk-based research and a visual inspection of the site – no intrusive or investigatory work into the site or its environs has been undertaken to confirm the results of the assessment.
- No photographs were discovered that showed the area of the station with the farm buildings in the 19th century. It is possible they exist but would likely be held within a personal family collection associated with either the Boyes or the McBride's.
- There was little historic documentation that dealt with the more minor aspects of the station, such as the exact nature of the buildings located at the site. While the various owners of the station were often prominent individuals within the community, documenting the daily running of the farm was not considered an important task in the 19th century.
- Due to the scale of the station, finding smaller historic details about buildings has been difficult. Maps of the area generally had a broad coverage, and any detail that was added was focused towards the homestead and its associated buildings at Kawarau Falls.
- Significant changes to the site in the early 21st century have removed many of the 19th century details of the buildings on site.

Outcomes – Research Results

Historical Documentation

There is a relatively restricted amount of historic documentation specific to the site, with most of record being confined to limited coverage of the homestead area adjacent to the lake next to the Kawarau Falls. However, the overall history of the Kawarau Falls Station is relatively well documented, and much can be inferred about the site at Woolshed Bay.

By the end of the 1850s European pastoralists had begun to stake out claims to various runs in the area, taking up the depasturing licences on offer. In 1859 Rees built a homestead and woolshed on the lake shore in what is now Queenstown to act as the centre of his large pastoral holdings (Griffiths, 1971). Following Rees' original homestead area being declared a new township following the discovery of gold in 1863, he was forced to shift his base of operations to Kawarau Falls. The earliest evidence of Rees and his family living at Kawarau Falls comes in a newspaper announcement of the birth 'at the Falls, Kawarau' of one of the family's' daughters in December 1863 (Lake Wakatip Mail 1863). This shift in his base of operations also required him to construct a new woolshed. The site that was chosen was a spot on the lake shore around 6 kilometres to the south of his homestead. The spot would have allowed sheep to be mustered in from the surrounding flat, as well as the side of the Remarkables. Once shorn, the wool could be transported by boat south down the lake to Kingston, before being transported further south over land.

Newspaper accounts of the time indicate that the woolshed had been constructed by 1864, and more likely was built in 1863, as it would have been required for shearing at the end of that year. By 1864 Rees was advertising for shearers at the end of October, and these men would have worked at the woolshed at Woolshed Bay (Lake Wakatip Mail, 1864b). Timber in the form of red beech was being supplied for construction from the head of the lake by September 1863 (Lake Wakatip Mail, 1863). Based on the limited supply of materials at the time, it is very likely that this red beech would have been used to build the original woolshed. At the same time, a timber jetty was built on the lake shore to allow goods and people to land and load from the site (Lake Wakatip Mail, 1864a).

The new shearing operations at the site subsequently required accommodation to be provided. In September 1865, a tender was advertised by Rees for the erection of a shearers' hut for Messrs Grant and Gammie (Rees' partners) at the principal woolshed on the Peninsula (Lake Wakatip Mail, 1865). Presumably this tender was taken up, and a shearers' quarters constructed at that time.

Following the subsequent dissolution of Rees' partnership with Grant and Gammie, the lease was sold to Messrs Boyes, brothers who then ran the station. Rees stayed on as manager into 1866, and was still organising the shearing gangs at the end of the year (Lake Wakatip Mail, 1866). At this time, the collection of runs was referred to as the Lake Runs. A topographical survey of the area in 1866 identified Rees' Woolshed on the lake shore and appears to show two smaller buildings to the west (Figure 4).

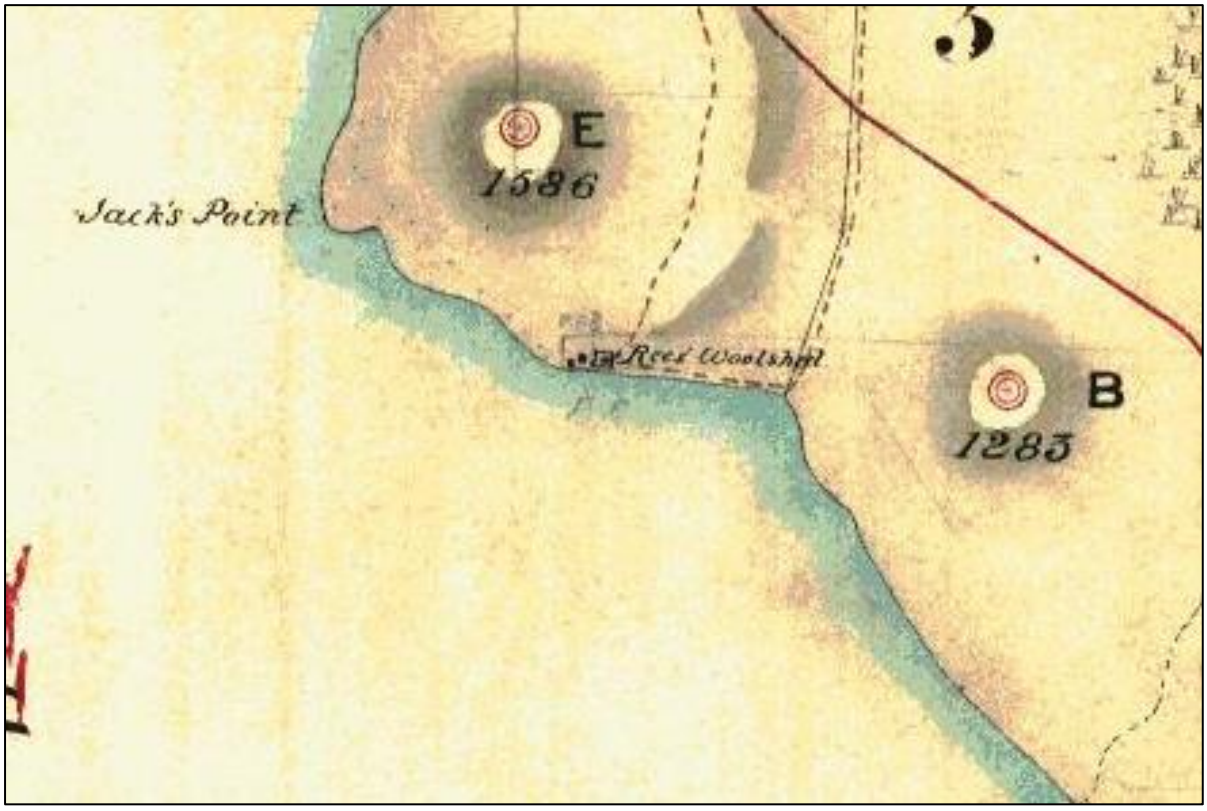


Figure 4. Topographical sketch (343) of the Coneburn District in June of 1866 cropped to the site showing Rees' woolshed and two smaller buildings to the west.

After the Boyes Bros. acquired the run, it reached its 19th century economical peak in the 1870s. The Boyes Brothers originally comprised of Charles Crofton Boyes and Frank Campbell Boyes. The partnership between Charles, Frank, and George Thomas Henry Boyes was dissolved in 1875 (LWM, 10 June, 1875). They were subsequently joined by George Thomas Henry Boyes. George Meredith Bell was involved with the ownership of the station between 1879 and 1881 when the Boyes Brothers were suffering financially (Jardine 1978).

The run became known as the Kawarau Falls Station, and there was significant expansion in the number of sheep (Lake Wakatip Mail, 1873b). This would have put pressure on the capabilities of the original woolshed as the numbers of sheep needing to be shorn increased. In 1875 Charles Boyes was granted permission by the Waste Lands Board to purchase 10 acres on Run 331 for the purpose of securing his woolshed in freehold (Bruce Herald, 1875). By owning the land that the woolshed was situated on, this would have provided more certainty the runholder that any costs sunk into the building would be secured under land ownership.

One year later in 1876, the Boyes Bros. tendered for additions and alterations to the woolshed. Plans and specifications for these additions were provided at Robertson and Co.'s timber yard, again suggesting that red beech would have been used (Lake Wakatip Mail, 1876). While the extent and form of these additions is unclear,

it may have been that Rees' original woolshed design was a simple rectangle in plan. The 1876 additions may have been to add extensions to the north and south elevations to accommodate new shearing boards and free-up the centre space. A subsequent 20th century description of the shed noted that shearing boards had existed on both sides, with eight stands a side (Jardine, 1978). It also appears that the woolshed had a small square tower fixed to the roof ridgeline which was used to accommodate the tall screw press. This is a characteristic of some historic Otago woolsheds (Thornton, 1986).

In 1877, valuations by the government were undertaken on existing runs. The Boyes argued in court at the time that without the run, the improvements on the land would be worth very little. They described the woolshed as an old building that was patched up from year to year. The associated dip for treating sheep (to the north) was part of and parcel of the run assessment (Lake Wakatip Mail, 1877). The station also had a set of farm buildings situated between the woolshed and the homestead. This included a stable, working men's quarters, smithy, and cookshop. These buildings were used as a central point for the farm workers to muster sheep around the station, as well as harnessing any horses needed for crop cultivation.

In the same year, the Boyes Brothers reached a peak of 29,000 sheep on the station. However, a hard winter and increasing problems with rabbits saw the flock gradually reduced to around 6,000 (Jardine, 1978). Economic depression coupled with the increasing challenges of running the station saw the lease transferred to the NZ Mercantile and Loan Company in 1886. A succession of managers then ran the station. The first was Donald Manson, followed by William Menzies and then William Sams (Adamson, 2007). It is very unlikely that any form of substantial building works would have occurred during this period.

The NZ Loan and Mercantile Co. suffered a financial crisis in 1893 and the struggling station was subsequently sold to Daniel McBride in 1898 (Chandler, 1996, Jardine 1978). Daniel McBride was one of the earliest settlers of the Wakatipu. When Daniel McBride took over the station it was run-down and in poor condition. McBride appears to have added substantial improvements to the property during his ownership (Griffiths, 1971). It is unclear if he undertook any improvements to the woolshed during his ownership, although he sought to improve the road from the homestead (Lake County Press, 1912). McBride died from injuries sustained after being thrown from a vehicle in 1913 (Lake Wakatip Mail, 3 March 1914), and the property passed to his son John P. McBride. John McBride ran the station through the difficulties caused by World War One.

During John McBride's ownership of the station, the revolutionary new technology of machine shearing was installed into the woolshed. An eight-stand machine shearing plant was installed on one of the boards, using the Began and Ball model. McBride determined that this machine shearing was going to replace blade shearing and nailed down the portholes on the blade side of the woolshed. He replaced the blade shearing board with sheep pens. However, this new system was soon found out to be ineffectual, and it reverted to an eight-man blade gang until 1956 (Jardine, 1978).

The original shearers' quarters built in 1865 and associated cookshop were also described by Jardine in his book (Jardine, 1978).

> "The old cookshop and quarters had tons of character. Built to an L-shaped plan, the long side of the L formed the dining room with the cook's quarters and the kitchen, dominated by a huge freestanding coal range, at the top end… A wide serving hatch ensured that the kitchen remained sacrosanct. Almost the full length of the fifty-foot-long dining room was taken up by a linoleum-covered table… At the bottom end were two doors, one leading through to the shearers' bunkhouse and the other outside. Here also was located a six-foot-wide fireplace and a colonial oven, relics of the original building, which now did duty as a dining room. This room and the central part of the woolshed had been built in the late 1860s and were still roofed by hand-split red beech shingles, though now covered by the more efficient but less picturesque corrugated iron."

The subsequent ownership by the Jardine's has been well recorded in oral and written accounts. When the station was acquired by the Jardine family in 1922, it was shearing around 5,500 sheep. This was approximately

half of its actual carrying capacity. The station had been reduced to 40,000 acres at the time of its sale. Subsequently in 1933, when numbers had increased, 10,000 sheep were brought in for dipping and shearing (Otago Daily Times, 1933). A photograph taken in the mid-20th century shows the eastern part of the woolshed and associated sheep pens during shearing (Figure 5). The shearers' quarters behind are obscured by the woolshed building.

In 1924 the old jetty was inspected by council, and measurements taken and costs estimated for a new structure. It is uncertain as to whether the jetty was partly or fully replaced at this time (Lake Wakatip Mail, 1924). Rail lines were installed at some point connecting the southern side of the woolshed to the jetty. This allowed material to be more easily transported on trolleys to the lake shore for shipment. A bathhouse was also built at some point, possibly during the Boyes Brothers ownership of the station, to allow shearers to bathe between shifts.

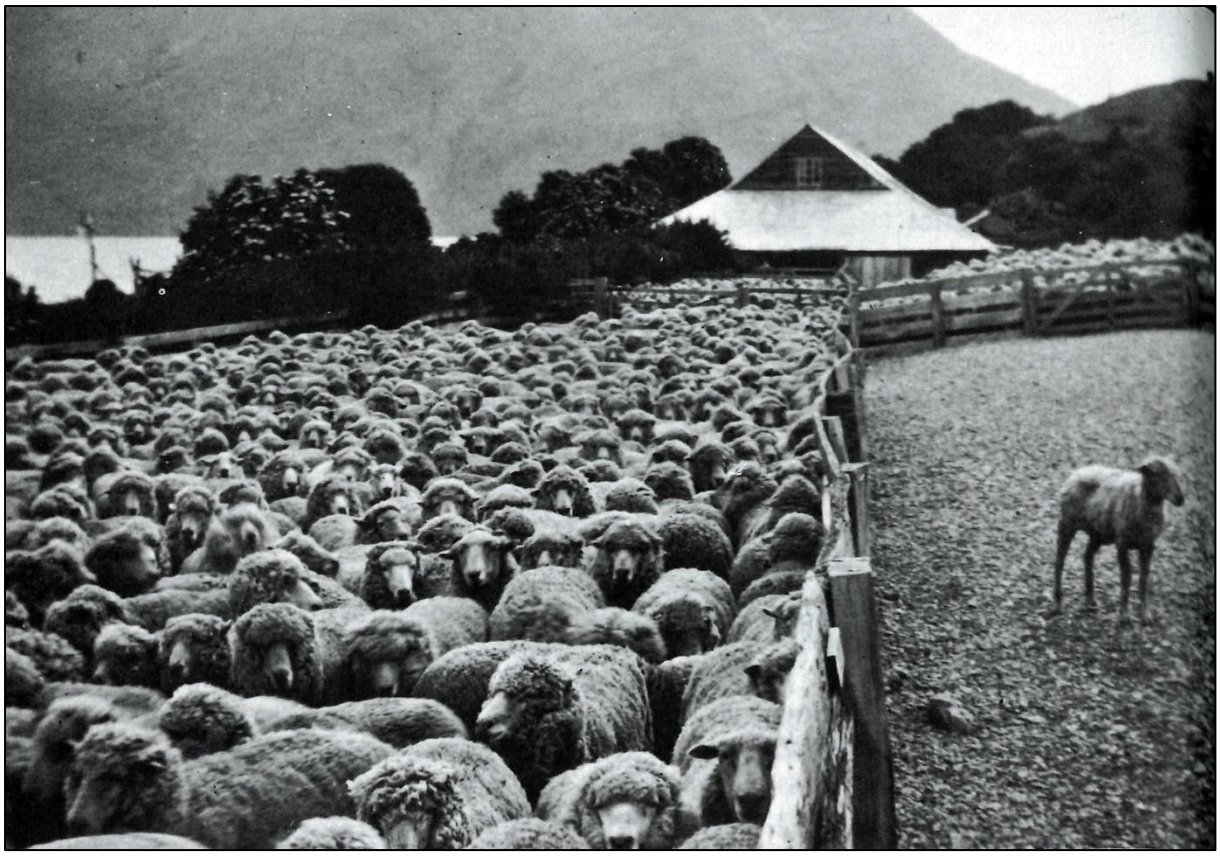


Figure 5. Mid-20th century photograph of the woolshed and associated sheep pens (Jardine, 1978).

Dickson Jardine junior ("Cap") took over and ran Run 331 "Staircase", in 1941. He subsequently subdivided the station, giving his son Grieve the Kawarau Falls portion of the old station, and retaining and renaming the remaining portion the "Remarkables Station" (Griffiths, 1971). The Remarkables Station was subsequently split in to two for both of 'Cap's' sons, Andrew and Dick Jardine.

The historic shearers' quarters subsequently burnt down in the mid-20th century. The historic quarters had been replaced by that stage by a building relocated from the Roxburgh Dam construction project, which finished in 1959. A new addition was added to the relocated building in 1993.

In 2007 the historic woolshed was extensively remodelled during its conversion into a residential dwelling. This included removal of internal linings such as floors, walls, and ceilings, as well as modifications to the roof and modern additions including a turret and glazed lean-tos. Parts of the historic fabric of the woolshed were incorporated into the new building as features.

On-site Observations

A site visit was conducted by Benjamin Teele on the 16th of March, 2020. This was undertaken to investigate if there were any potential archaeological features visible and to place the site within the context of the surrounding area.

The on-site inspection of the site revealed a number of modified historic features forming part of the extensively 21st century modifications that have been undertaken to the site. A map of these features is presented below (Figure 6).

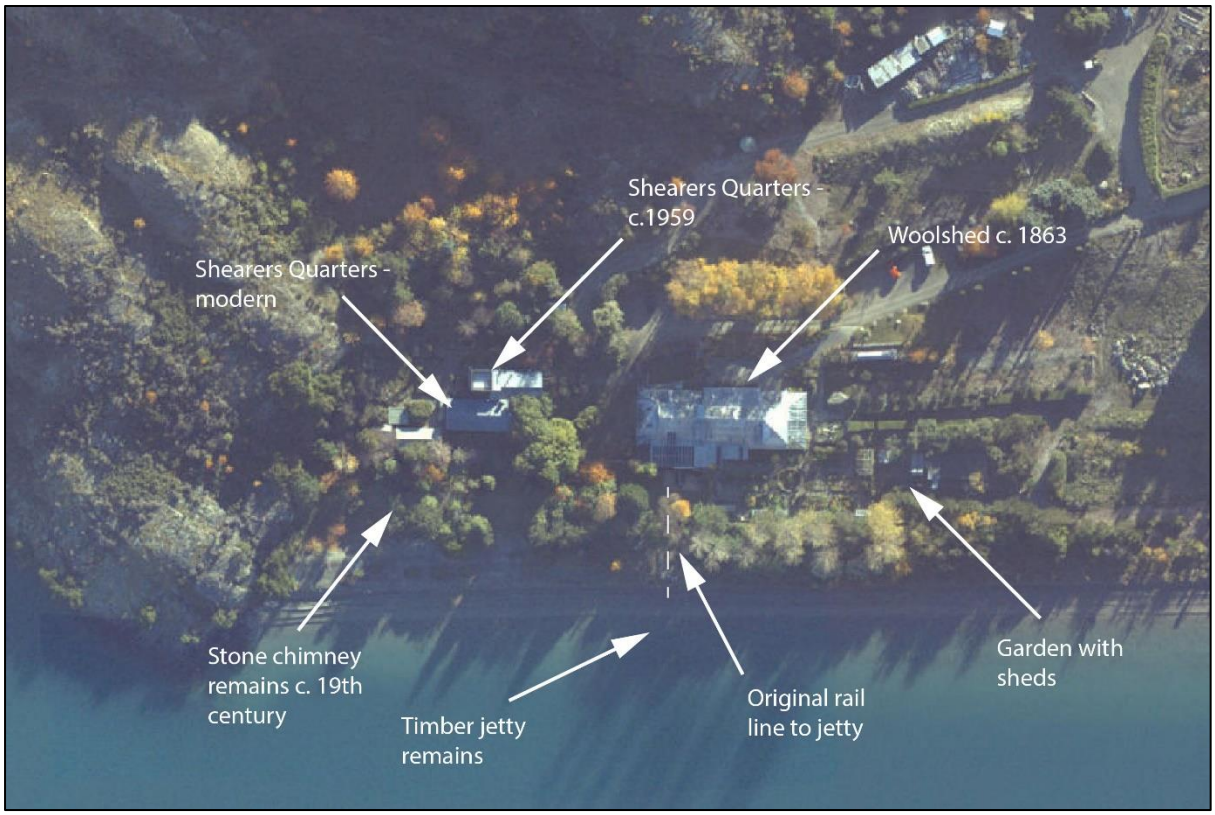


Figure 6. Modern aerial imagery overlain with labels identifying main historic features of the site.

The current woolshed building has been extensively modernised during its conversion to a domestic residence in 2007 (Figure 7-Figure 14). Its original footprint can still be determined based on the gables and roof ridgeline. A number of modern additions have been added to all elevations, and a turret to the eastern end. A large number of skylights have been added to the roof. Internally, the building has been converted to allow residential living (Figure 15-Figure 18). Portions of the historic fabric of the woolshed have been reused as features or wall linings. This includes original red beech timber shingles and portions of roofing iron.

Immediately to the west of the woolshed is a flat grassed area bordered with mature gardens (Figure 19). Between the woolshed and lakeshore is the small galvanised bathhouse on timber skids (Figure 20, Figure 21). To the south of the woolshed are the remains of the historic timber jetty in the lake (Figure 22, Figure 23). This space was also where the rail line ran from the woolshed to the wharf, with the remains of an old rail trolley visible (Figure 24-Figure 26).

To the west of woolshed through the trees are the remains of a schist stone chimney (Figure 27). These remains are situated in an area of flat ground just beyond the gravel beach, south of the 20th century shearers' quarters (Figure 28). This stone chimney is what likely remains of the historic shearers' quarters original built in 1865.

To the east of the woolshed are extensive gardens, which include glasshouses and a chicken coop (Figure 29-Figure 32). Two of the sheds present in the garden may be of some age and connected to the original homestead area at Kawarau Falls.

Figure 7. View of historic woolshed from driveway, looking at northern elevation and glass addition to eastern elevation.

Figure 8. Eastern elevation of woolshed.

Figure 9. South-eastern corner of the woolshed.

Figure 10. Part of southern elevation of woolshed.

Figure 11. South-eastern corner of woolshed.

Figure 12. Western elevation of woolshed.

Figure 13. View of woolshed roof showing modern roofing iron and glazing.

Figure 14. Contemporary turret reflecting original extension to roof line to allow space for wool press.

Figure 15. 21st century modifications to woolshed building following conversion into residence.

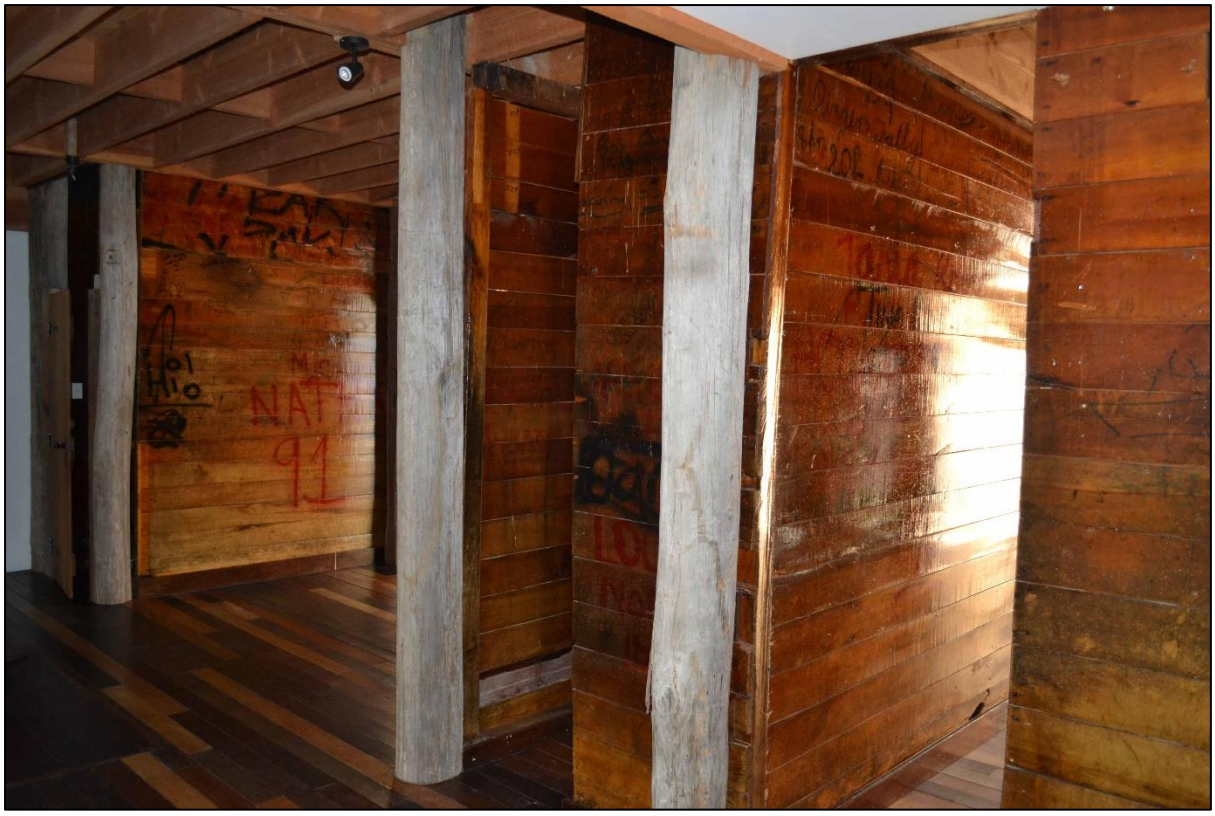


Figure 16. Internal walls of woolshed showing reuse of timber boards as wall linings.

Figure 17. Re-used roofing iron in converted woolshed.

Figure 18. Re-used timber shingles on ceiling interior above main entrance.

Figure 19. Area immediately to the west of the woolshed.

Figure 20. Galvanised iron bathhouse located to the south of the woolshed.

Figure 21. Interior of galvanised iron bathhouse.

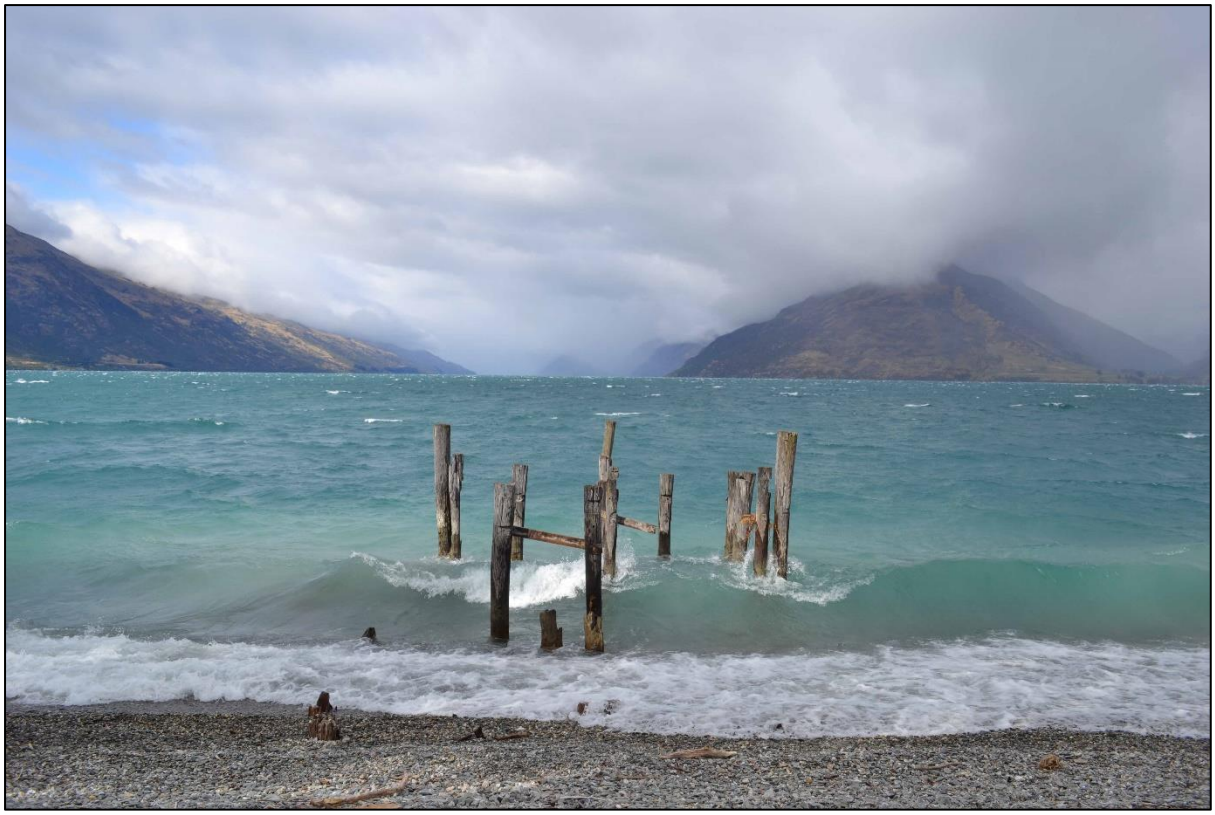


Figure 22. Remains of timber wharf piles located to the south of the woolshed.

Figure 23. Remains of timber wharf structure.

Figure 24. Location of where rail line ran from woolshed to wharf.

Figure 25. Remains of trolly used on railway to move material from the woolshed to the wharf.

Figure 26. View looking east along the gravel beach towards the wharf.

Figure 27. Stone remains of fireplace located to the west of the woolshed, likely remains of original shearers' quarters.

Figure 28. 20th century shearers quarters located to the west of the woolshed. Building on right relocated from the Roxburgh Dam project circa 1959.

Figure 29. Garden with glasshouses to the east of the woolshed.

Figure 30. Galvanised iron and timber-framed chicken coop in garden.

Figure 31. Galvanised iron shed with timber door in garden.

Figure 32. Fruit trees beyond garden to the east.

Archaeological and Other Values

Six main criteria have been used for assessing the archaeological values of the Hakitekura-Woolshed Bay Site. These are:

- Condition – the physical condition of the site and any associated features.
- Rarity/Uniqueness – the degree of rarity of the site within its immediate and/or wider contexts.
- Contextual Value – the contribution of the site to its broader contextual situation (e.g. cultural, local and archaeological contexts).
- Information potential – the potential for additional information to be recovered by archaeological means and its nature.
- Amenity value – the potential contribution of the site as a local amenity.
- Cultural associations – the cultural associations of the site.

Site	Value	Assessment
Hakitekura-Woolshed Bay Lot 1 Deposited Plan 452315 Lot 3 Deposited Plan 452315	Condition	The condition of the site is limited to observations of extant structures. The existing woolshed has been extensively modified by the recent changes to a residential dwelling, and so is in good condition. However, very little of the original building appears to have remained unmodified. The timber jetty is in very poor condition and continues to degrade. The schist stone chimney is exposed and is in poor condition. The condition of any in-situ subsurface remains is unknown, but likely to have been disturbed by 20th and 21 century activity in some places. Assessment – building remains - poor, subsurface - unknown
	Rarity/ Uniqueness	The site contains the historic remains of the second woolshed to be built in the basin by William Rees in 1863. However, the building has undergone significant modification and retains little of its original form, with re-used fabric. The wider site still contains historic features associated with the use of the site as part of Kawarau Falls Station. This includes the timber jetty and what remains of the original shearers' quarters. There were only a small number of large pastoral leases that were created in the 1860s and 1870s in the Wakatipu Basin, so this increases the local rarity of the site. Regionally, there are a number of preserved buildings associated with early pastoral runs. Assessment – moderate
	Contextual Value	The site is clearly associated with the runholders who acquired the Kawarau Falls Station. This started with William Rees in 1863 and went through a small number of owners and managers. It was acquired by the Jardine family in 1922 and was retained in that family until very recently. Assessment – high

	Information Potential	There are a number of extant buildings associated with early pastoral leases in Otago. The assessment site has undergone a number of recent modifications to the extant woolshed which has significantly lessoned the information potential of this building. It is possible that subsurface material may exist which relates to the 19th century use of the site, particularly in the area around the original shearers' quarters. Assessment – moderate
	Amenity Value	The amenity value of the site is limited due to it being privately owned and not visible except via the lake. The woolshed has undergone significant modifications in the 21st century, which has lessened its historic amenity values. The remaining features are in poor condition and scattered around the site. Assessment - low
	Cultural Associations	The buildings and possible archaeological in-ground features have significant cultural associations with the operation of the Kawarau Falls Station and historic pastoral farming within the Wakatipu Basin. Any archaeological remains will tie directly to the site's use by owners and managers of the Kawarau Falls Station. Assessment – high
	Other Values	Māori cultural values are not considered to be of immediate relevance to the site unless features or deposits relating to Māori cultural practices are identified during any future works. While the wider basin was utilised by local Māori, the likelihood for encountering such deposits below the site has been assessed as very low. But the possible value of the site and its location in broader, Māori cultural value terms is acknowledged. Assessment - very low

Assessment of Effects

Proposed Site Works

The proposed site works will involve the construction of a new lecture theatre attached to the existing woolshed, plus several additional separate buildings for accommodation and service purposes (Figure 33). The concept design shows the woolshed building and lecture wing forming one part of the main works. The University intend to seek resource consent for a proposed future development stage which provides for a 120-person lecture theatre. This potential future expansion will be located alongside and immediately to the west of the 60-person lecture theatre shown in Figure 33. This will include the demolition of the existing 20th century shearers' quarters and extensive landscaping. To the east a new building will include rooms for guests and associated car parking. A new staff accommodation house will be built in between. It is possible due to the site's proximity to the lake and the underlying lake gravels extensive excavation may be required to provide a suitable foundation for the proposed buildings. These works will also require trenching for installation of new service and general landscaping associated with amenity planting and site access.

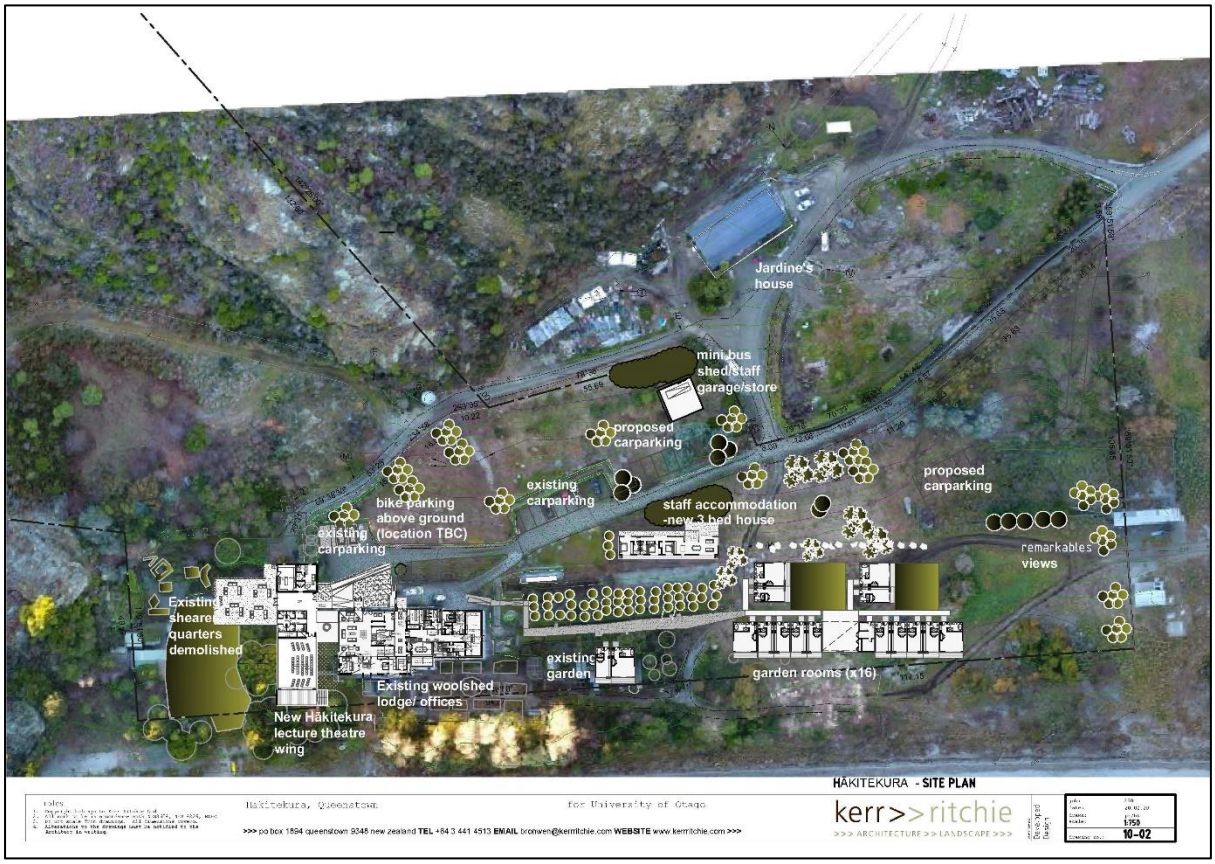


Figure 33. Kerr Ritchie concept design for the Hakitekura/Woolshed Bay site.

The Effects of the Proposed Works

The effects of the proposed site works are likely to see any remaining in-ground archaeology disturbed or destroyed in the areas around the existing woolshed and shearers quarters, and to the east where the construction of the two new buildings will be undertaken. (see Figure 33 above). The depth of excavation required to provide adequate foundational support is likely to extend deeper than the current cultural horizon. It is possible there are several deeper features associated with elements such as latrines or rubbish pits that may have survived intact. Trenching for services and landscaping elements will cross the site as required.

Alternative options

Alternative options are limited for this site. The existing woolshed has already been extensively modified, and as such further works to convert it into lodging and offices will therefore already be within the modern disturbance footprint. The new lecture theatre wing looks to utilise the existing woolshed building and will cover a portion of the site to the west. This area may contain traces of earlier 19th century activity, but this is unclear. The lack of suitable flat ground elsewhere and the unknown nature of any archaeological deposits do not suggest it should be relocated. The two new buildings are set at some distance from the extant woolshed building and works are unlikely to encounter substantive archaeological deposits. As such, no alternative recommendations are suggested.

Site management

Site management should note the historic importance of the site and the potential impact of works on any in-situ archaeological material if it has survived.

Conclusion and Recommendations

Assessment Summary

This report provides an assessment of the proposed construction of a new academic retreat and conference facility for the University of Otago, and the potential effects on the archaeological values of the site.

The site has a clearly documented history dating from 1863 when William Rees was forced to shift his pastoral farming operations from Queenstown to Kawarau Falls. In urgent need of a woolshed, Rees appears to have built his new building at the edge of Lake Wakatipu using timber from Kinloch. This new woolshed allowed him to begin rebuilding his run. The addition of a shearers' quarters in 1865 was at a time when the station was being transferred over to its new owners, the Boyes Brothers. Increasing numbers of sheep on the run and a peak in economic prosperity in the 1870s saw the woolshed expanded in 1876. The station reached its peak numbers the following year, before harsh winters and rabbit plagues saw the eventual transfer of the station over to managers during the economic slump of the 1880s. Taken over by the McBride's at the end of the 19th century after a series of managers, it never reached the numbers achieved by the Boyes Bros during their ownership. The advent of machine shearing saw a brief change to how the woolshed was used. After it was acquired by the Jardine family in 1922 the site appears to have remained relatively unchanged for a number of decades. Changes in the wider basin in the second half of the 20th century saw increasing shifts towards residential development, and the division of the larger station into smaller farms. The shift towards transporting goods by road after Depression era works also saw the importance of the sites' location diminish. In the early 21st century, the woolshed was converted to a domestic residence with associated gardens and landscaping.

This assessment has identified that the proposed works associated with the construction of a new academic retreat and conference facility will likely have some impact on subsurface archaeological remains if present. The woolshed itself has undergone relatively recent modifications, and these works likely created an extensive disturbance footprint. Excavation works for the new buildings and related services may encounter archaeological material related to the sites 19th century pastoral use. How much of this material remains in-situ is unclear, and it may be that substantial parts of the site outside of the woolshed have also been disturbed.

Because of the limited impact of the works on known archaeological material, there are no known alternative options. The proposed concept design looks to incorporate the woolshed building into the new theatre complex. The site has undergone such significant 21st century changes already, that the overall archaeological values of the site are likely to be limited to specific undisturbed subsurface features if they exist.

Recommendations

Based on the proposed plan to construct a new academic retreat and conference facility at the Hakitekura/Woolshed Bay site, Origin Consultants make the following recommendations:

- The proposed development will impact archaeological values associated with F41/843. As such, an archaeological authority under Section 44 of the Heritage New Zealand Pouhere Taonga Act (2014) should be obtained from Heritage New Zealand prior to any earthworks commencing on site.
- Particular care should be exercised in the area immediately to the west of the woolshed. This area historically contained at least two buildings associated with the running of the Kawarau Falls Station. Excavation works in this including the removal of the 20th century shearers' quarters foundations should be monitored closely by an archaeologist.
- It is possible that additional archaeological material or features may be uncovered outside the core area around the woolshed and 20th century shearers' quarters, so every practical effort should be made to avoid damage to any archaeological site, whether known, or discovered during work.
- The site has an important history for the running of the Kawarau Falls Station, including a strong connection with William Rees in the 1860s. If feasible, something in the form of interpretive

information for guests could be installed within the new lecture theatre complex. Consideration should also be given to reinstating some of the historic features associated with the site, including the trolley, any pieces of rail encountered, the bathhouse, and the schist stone chimney remains.

- Contractors should be informed and briefed of the possibility that archaeological material may be uncovered during works as well as the wider archaeological site values. This includes immediate cessation of works in the area of discovery and communication with the approved archaeologist in how to proceed.
- If any subsurface archaeological features are uncovered during excavations, these should be recorded using appropriate archaeological standards by the approved archaeologist.
- If at any stage during site works pre-European (Māori) material is discovered, Heritage New Zealand should be consulted in the first instance. There are historic recordings of isolated Māori features and material culture in the wider Wakatipu Basin, but it is unlikely the proposed works will encounter any such items. If pre-European material is encountered during works, then all work is to cease immediately with a 20m exclusion zone established around the find with damage to any material minimised or avoided. Once the Regional Archaeologist has been contacted, they will advise on the best way to proceed. Any pre-European artefacts will be, prima facie, property of the Crown and will be submitted to the appropriate institutions.

References

Anderson, A. J. (1982). Maori settlement in the interior of Southern New Zealand from the early 18th to late 19th centuries A.D. *Journal of the Polynesian Society*, *91*(1), 53–80.

Beattie, H. (1979). *The Southern Runs*. Invercargill: Times Printing Service.

Bruce Herald. (1875). *Waste Lands Board*. BRUCE HERALD, VOLUME VIII, ISSUE 732, 7 SEPTEMBER 1875.

Griffiths, G. J. (1971). *Queenstown's King Wakatip*. Dunedin: John McIndoe Limited.

Hamel, J. (2001). *The Archaeology of Otago*. Department of Conservation.

Jardine, D. (1978). *Shadows on the Hill (Remarkables Station)*. Wellington: A.H. and A. W. Reed.

Lake County Press. (1912). *Lake County Council*. ISSUE 2414, 15 FEBRUARY 1912.

Lake Wakatip Mail. (1863). *Page 6 Advertisements Column 2*. LAKE WAKATIP MAIL, VOLUME I, ISSUE 36, 2 SEPTEMBER 1863.

Lake Wakatip Mail. (1864a). *Lake Wakatip Mail*. ISSUE 161, 12 NOVEMBER 1864.

Lake Wakatip Mail. (1864b). *Page 3 Advertisements Column 1*. AKE WAKATIP MAIL, ISSUE 154, 19 OCTOBER 1864.

Lake Wakatip Mail. (1865). *Page 2 Advertisements Column 1*. LAKE WAKATIP MAIL, ISSUE 245, 2 SEPTEMBER 1865.

Lake Wakatip Mail. (1866). *Page 2 Advertisements Column 1*. LAKE WAKATIP MAIL, ISSUE 373, 28 NOVEMBER 1866.

Lake Wakatip Mail. (1873a). *Country Notes*. Issue 786, 3 December 1873, Page 2.

Lake Wakatip Mail. (1873b). *Page 3 Advertisements Column 1*. LAKE WAKATIP MAIL, ISSUE 783, 12 NOVEMBER 1873.

Lake Wakatip Mail. (1876). *Page 2 Advertisements Column 1*. LAKE WAKATIP MAIL, ISSUE 959, 9 MARCH 1876.

Lake Wakatip Mail. (1877). *Lake County Assessment Court*. LAKE WAKATIP MAIL, ISSUE 1009, 15 MARCH 1877.

Lake Wakatip Mail. (1924). *Lake County Council*. LAKE WAKATIP MAIL, ISSUE 3590, 3 JUNE 1924.

Otago Daily Times. (1933). *The Rural World*. OTAGO DAILY TIMES, ISSUE 21900, 11 MARCH 1933.

Petchey, P. (2001). *Jacks Point Development, Remarkables Station - Archaeolgoical Assessment*.

Teele, B. (2015). *Henley Downs Stables Archaeological Assessment*.

Teele, Benjamin. (2016). *Hanley Downs, Queenstown - Archaeological Assessment*.

Thornton, G. (1986). *The New Zealand Heritage of Farm Buildings*. Auckland: Reed Methuen Publishers Ltd.

Wilmshurst, J. M., Anderson, A. J., Higham, T. F. G., & Worthy, T. H. (2008). Dating the late prehistoric dispersal of Polynesians to New Zealand using the commensal Pacific rat. *Proceedings of the National Academy of Sciences* , *105*(22), 7676–7680. https://doi.org/10.1073/pnas.0801507105

Appendix A- Site Record Forms

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: F41/843

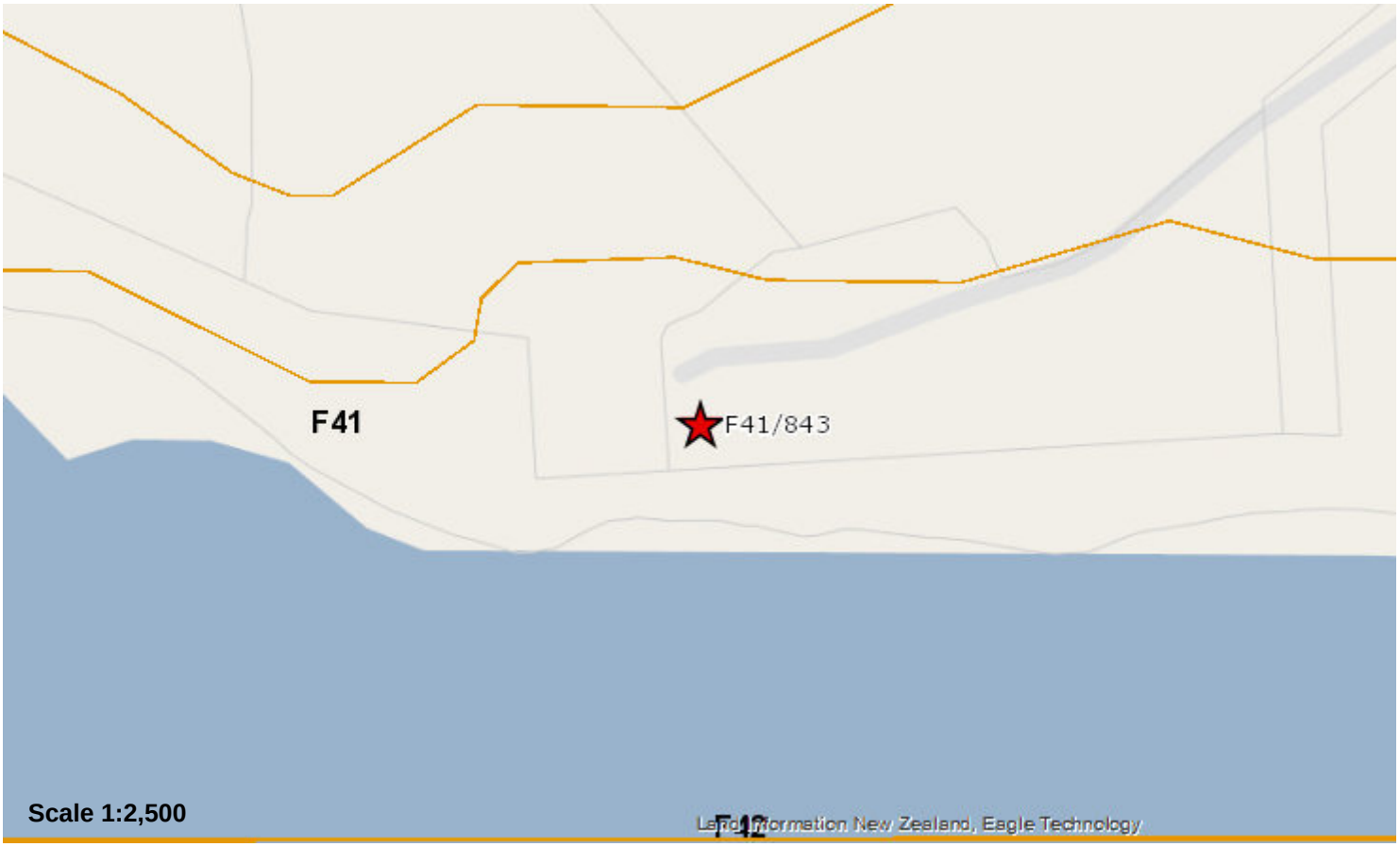
SITE TYPE: Agricultural/ pastoral

SITE NAME(s): Woolshed Bay

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1263910 **Northing:** 4998360 **Source:** On Screen

IMPERIAL SITE NUMBER: **METRIC SITE NUMBER:** F41/843



Finding aids to the location of the site

Site is located south of Jack's Point, accessed off Maori Jack Road at the southern end of a private driveway facing Lake Wakatipu.

Brief description

Recorded features

Building - wool shed

Other sites associated with this site

SITE RECORD HISTORY	NZAA SITE NUMBER: F41/843

Site description

Updated 25/03/2020 (Field visit), submitted by benteele , visited 16/03/2020 by Teele, Benjamin
Grid reference (E1263910 / N4998360)

The site is the historic location of a woolshed and associated buildings including shearers quarters and bathhouse for the Kawarau Falls Station. The site was chosen due to its proximity to Lake Wakatipu, allowing goods to be shipped to and from the site via the lake. The remains of a timber jetty are still visible on the lake shore. The woolshed was originally built circa 1863 by William Rees, before being modified by the subsequent run holders (Boyes Brothers) in the mid-1870s. Subsequent economic depression due to rabbit plagues saw the site remain relatively unchanged through into the 20th century. The original shearers quarters burnt down mid-20th century and were replaced by a building sourced from the Roxburgh Dam project. Extensive alterations to the woolshed and site were undertaken around 2007, including the complete remodel of the woolshed into a residential dwelling. These works were carried out without an archaeological authority, and little is known of the disturbance footprint. All other buildings on site are either post-1900 in origin or relocated from other parts of the station.

Condition of the site

Updated 25/03/2020 (Field visit), submitted by benteele , visited 16/03/2020 by Teele, Benjamin

The only remaining historic fabric of the woolshed has been repurposed into a residential dwelling, with the result of losing all contextual information. Other visible features in the site include the remains of a schist stone chimney likely associated with the original shearers quarters, and degrading timber piles that formed the jetty. Any in-situ subsurface material has likely been extensively disturbed by 20th and early 21st century activity.

Statement of condition

Current land use:

Threats:

SITE RECORD INVENTORY	NZAA SITE NUMBER: F41/843

Supporting documentation held in ArchSite