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IN THE MATTER OF	the Resource Management Act 1991
BEFORE	Tasman District Council
AND	
IN THE MATTER OF	an application by Adcock & Donaldson Properties Ltd to establish a Motorsport Park at Stanley Brook

EVIDENCE OF ANDREW JAMES DAKERS

Andrew James Dakers

Director and Principal Engineer

ecoEng LIMITED

24 February 2012

1. My full name is Andrew James Dakers. I hold the qualifications Bachelor of Engineering (Natural Resource), Master of Engineering (Canterbury University) I am currently Director and Principal Engineer with ecoEng Ltd, based in Christchurch. My first professional appointment (1972) was as an engineer with the Ministry of Agriculture and Fisheries. From 1979 to 1999 I was a member of the academic staff at Lincoln University where I was a Senior Lecturer and Assistant Head and then Head of Department in the Department of Natural Resource Engineering. Since 1999 I have been involved in private engineering consulting and have expertise in agricultural irrigation and wastewater systems, small scale domestic wastewater, stormwater and water supply systems in mostly in New Zealand but also in the Cook Islands and Fiji. I have been involved in infrastructure assessment in small tourist towns and have extensive experience in site and risk assessment, modelling, design, resource consenting, auditing, environmental impact assessment, installation supervision, preparing servicing and maintenance programmes and reporting for on-site, decentralized wastewater systems and remote sites. I am a key member of the Centre for Environmental Training (CET) team and since 2003, have been involved as both organizer and senior tutor in more than forty 2-3 day in-service training courses on on-site wastewater engineering in Australia, New Zealand and the Cook Islands. Since early 2009 I have been an appointed member of the Management Audit Group for the On-site Effluent Treatment (OSET) National Testing Programme (based in Rotorua). I am a member of Water NZ and Small Wastewater and Natural Systems Special Interest Group (SWANS-SIG) and am a Board Member of the International Ecological Engineering Society (IEES).
2. I have read (and am familiar with) the Code of Conduct for Expert Witnesses and I confirm that this statement of evidence (and any oral evidence I may give in the course of this hearing will) be in accord with that code of practice.
3. I have been engaged by the Applicant, Adcock & Donaldson Properties Limited to provide advice on the potentiality for on-site wastewater disposal on the property that is the subject of this application. I attended at the site on the 13th day of the February 2012. I was on the site approximately 3 hours and during that time I:
    a. walked over the site;
    b. investigated the areas the site where the ablution facilities and accommodation facilities were proposed;
    c. assessed soil profiles.
4. <u>Terrain and vegetation</u>.

    The site is remote and is a long incised valley. Valley floor drains NNW at an average grade of about 2%. The valley side slopes typically vary from 10% to 50%

    The valley floor is currently scrubby pasture and grazed, while the valley slopes are in pine plantation. (See **Photo 1**).
5. <u>Soils.</u>

    The valley floor is made up of a combination of mostly alluvial soils with colluvium. Soils on the valley slopes are derived from Moutere gravels and predominantly Norris and Spooner soils which are a loam soil over clay, stony and moderately well drained. **These soils are moderately well draining but also moderately erodible.**

The soils suitable for the application of treated wastewater and effects less than minor can be achieved.

6. Groundwater.

   Groundwater table depth was not measured during the site visit as it was not considered necessary to do so. On valley floor static groundwater levels may be within a few metres of ground-level. There are sufficient areas of elevated land available should it be necessary to increase the separation of groundwater from land applied treated wastewater.

7. Surface waters.

   The Stanley Brook stream runs SE to NW down the valley. There are minor tributaries feeding to the stream. Accepted setback distances can be applied to protect surface waters from contamination (pathogens and nutrients) from applied treated wastewater to land. There is adequate land area available to easily achieve these set back distances.

8. Flood hazard.

   If flood events are a risk at this site, from the point of view of safe management of wastewater, there are adequate elevated land areas for the application of treated wastewater. Land area requirement is discussed in more detail in Clause 11b.

9. Wastewater loads.

   There will be both peak wastewater loadings during events as well as steady wastewater loadings for permanent residents. It is acknowledged that during events the permanent wastewater facilities will be loaded at a higher rate than during non-event periods. This can be catered for by including balancing storage. The wastewater management plan will be inclusive of both permanent and event loading regimes.

   The following table is an estimate of the design wastewater load for the on-site wastewater facilities that will be provided to cater for both the permanent residents and the increased load during events. It is to be noted that during larger events it is proposed that portaloos will be installed to take the major event load.

Table 1. Design Wastewater Loads for on-site management (excludes portaloo loadings during large events.

Activity	Facility	Estimated design patronage	Wastewater vol/patron	Daily wastewater volume
		Daily	L/day	L
Motor Cross Lake activities	Ablution block 1	50	20	1000
Supermoto area	Ablution block 2	50	20	1000
Off road	Ablution block 3	50	20	1000
Rally road	Ablution block 4	40	20	800
Club room pit area	Ablution block 5	40	50	2000
Drag strip	Ablution block 6, 7 and 8	200	20	4000
Kids pee wee area	Ablution block 9	40	20	800
Confidence course	Ablution block 10	40	20	800
Luge area	Ablution block 11	60	20	1200
Commercial Area (incl conference area)		200	40	8000
Accommodation, 96 beds	Full facilities	100	200	20000
Camping ground	Full facilities 15 sites, 4 per site	60	120	7200
Caretakers house	Full facilities	5	200	1000 48800
	Total daily design flow (L/day)			**48800**

10. <u>Wastewater treatment</u>

There is a number of wastewater treatment technologies that could be installed on-site to treat the wastewater to a standard suitable for safe application to the land and achieving less than minor effects in terms of health risks and risk to local ecosystems. Examples of such technologies include:

a. Process engineered treatment units such as sequential batch reactors (SBR) and aerated activated sludge units
b. On-site treatment package plants such as recirculating textile or sand filters, membrane bioreactors (MBR), submerged aerated filters (SAF) wastewater treatment plants.

c. The treatment unit(s) may be configured to receive wastewater from a number of sources or a single source depending on what will be the optimum arrangement.

The most appropriate technology for this site will depend on the site specific details. It would be unwise to recommend a preferred technology at this early stage of the proposal.

11. <u>Wastewater land application systems (LAS)</u>

a. The treated wastewater from the installed treatment units will be land applied within the property boundaries and in accordance with standard practices as determined by AS/NZS1547:2000 and recognized guidelines such as *NZ Guidelines for the Utilisation of Sewage Effluent on Land*, published by NZ Land Treatment Collective and Forest Research 2000. For a particular design loading and effluent quality these standards and guidelines specify land application design and management criteria based on site specific characteristics such as soil profile and type, topography, land cover, natural hazards (flood risks), set backs from groundwater, surface waters and boundaries.

b. Based on my soil and site assessment for this site and the estimated wastewater loads as in Table 1, I am confident that there is more than adequate suitable land area available for safe and consentable management of the treated wastewater. For example for a loading rate of 3L per day/m^2, a relatively conservative loading rate for the soil types at this site, the land area required for the LAS would equate to about 1.6 ha.

12. For those sources that are likely to be significantly affected by event peak loading, balancing storage tanks prior to the treatment plant and/or land application system would be advisable to protect the treatment capability of the treatment plant and to mitigate any risk of overload to the LAS. The balance tanks would be alarmed and when loading to the tank is excessive, it would be necessary and feasible to cart excess loads off site for safe disposal.

13. Portaloos will be installed for the large events. In addition, prior to an event, storage balance tanks should be emptied to provide maximum peak load buffering.

14. The final location and design of the park facilities is yet to be determined and development staging will be determined by the availability of funding. For these reasons detailed design of the wastewater management system is not possible. The design will be determined through the wastewater management plan, which will specify design standards that the system must meet.

15. <u>Compliance</u>

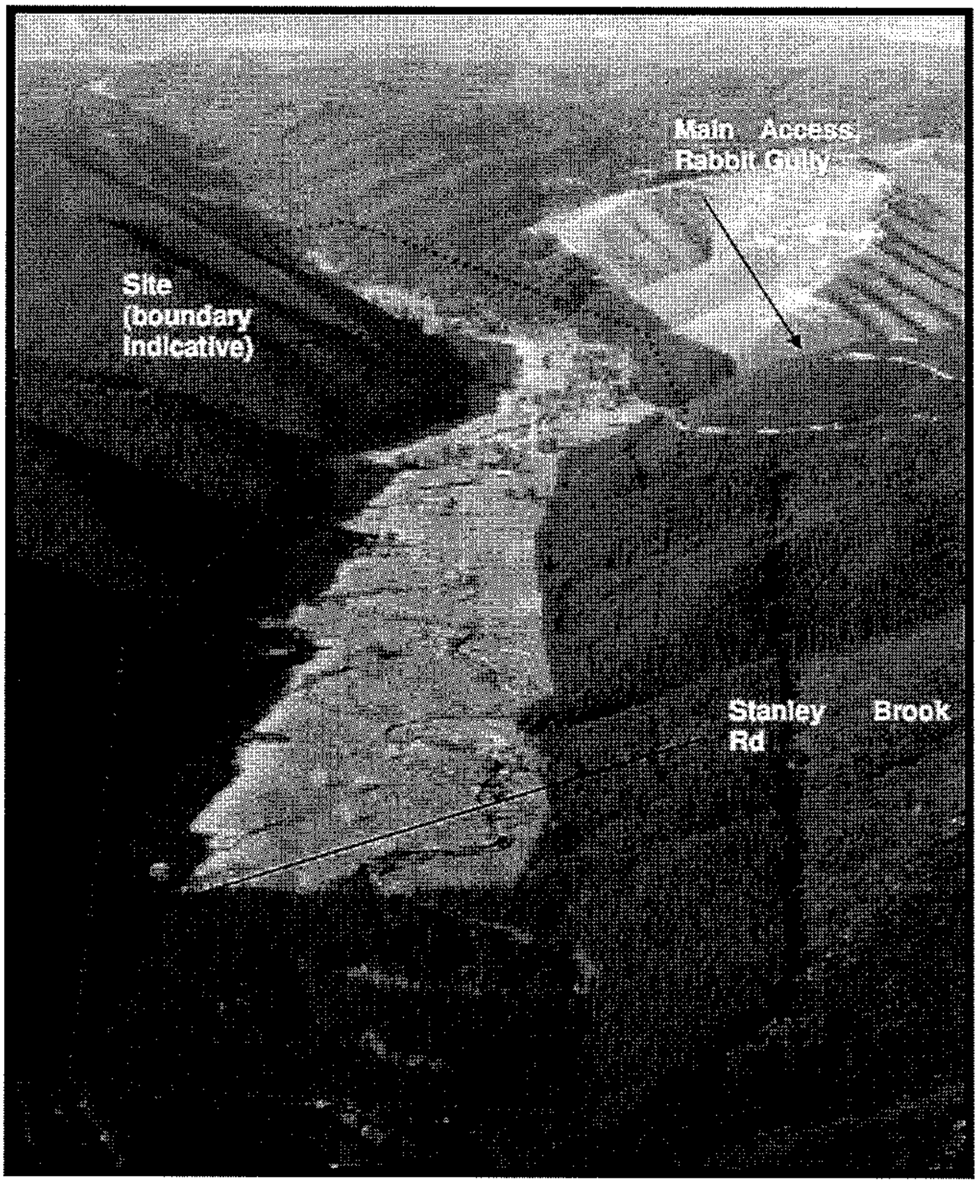
It is clear from Rule 36.1.2.4, Tasman Regional Council Regional Plan, that this proposal will not satisfy Permitted Activity conditions. A resource consent to discharge will be required.

16. I see no obstacles in being able to achieve the relevant requirements set out in AS/NZS1547:2000.

17. I see no obstacles in being able to achieve the requirements of draft conditions 1 to 17 inclusive, RM100878 and RM100879.

Appendix A Photos

Figure 1. Aerial view of site



Photos

Photo 1. View of Stanley Brook Valley looking north west.

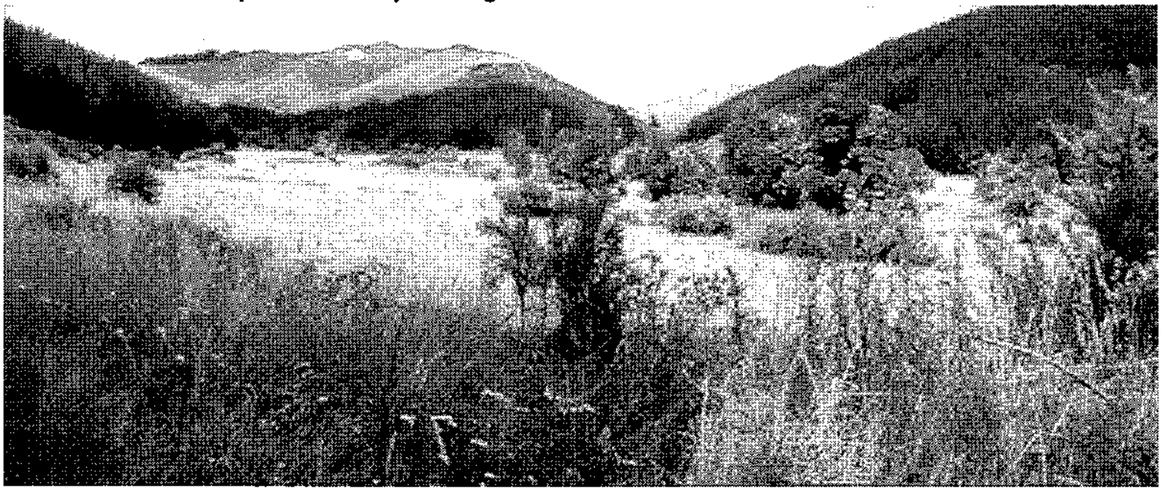


Photo 2. Valley slope soil profile. 3m embankment.

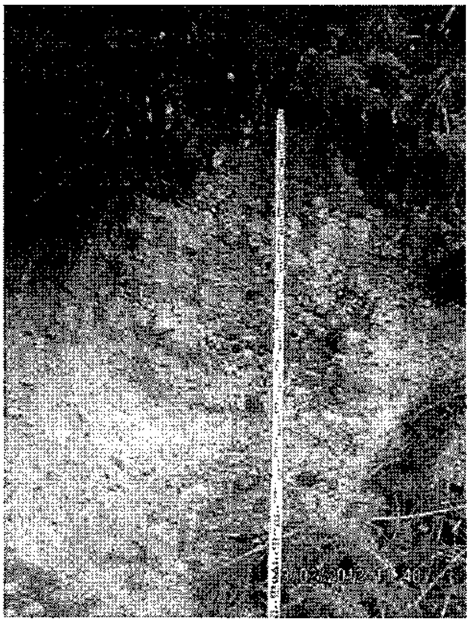


Photo 3. Valley slope soil profile showing very stony loamy clay, moderately well drained.

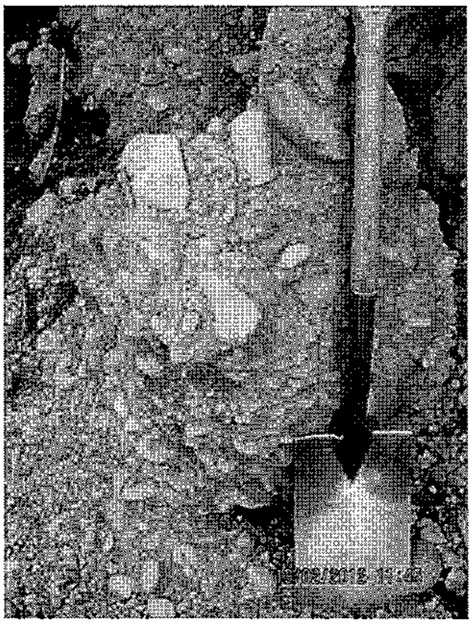


Photo 4. Soil profile embankment on valley floor showing moderately well draining stony sandy clay loam; moderately well draining.

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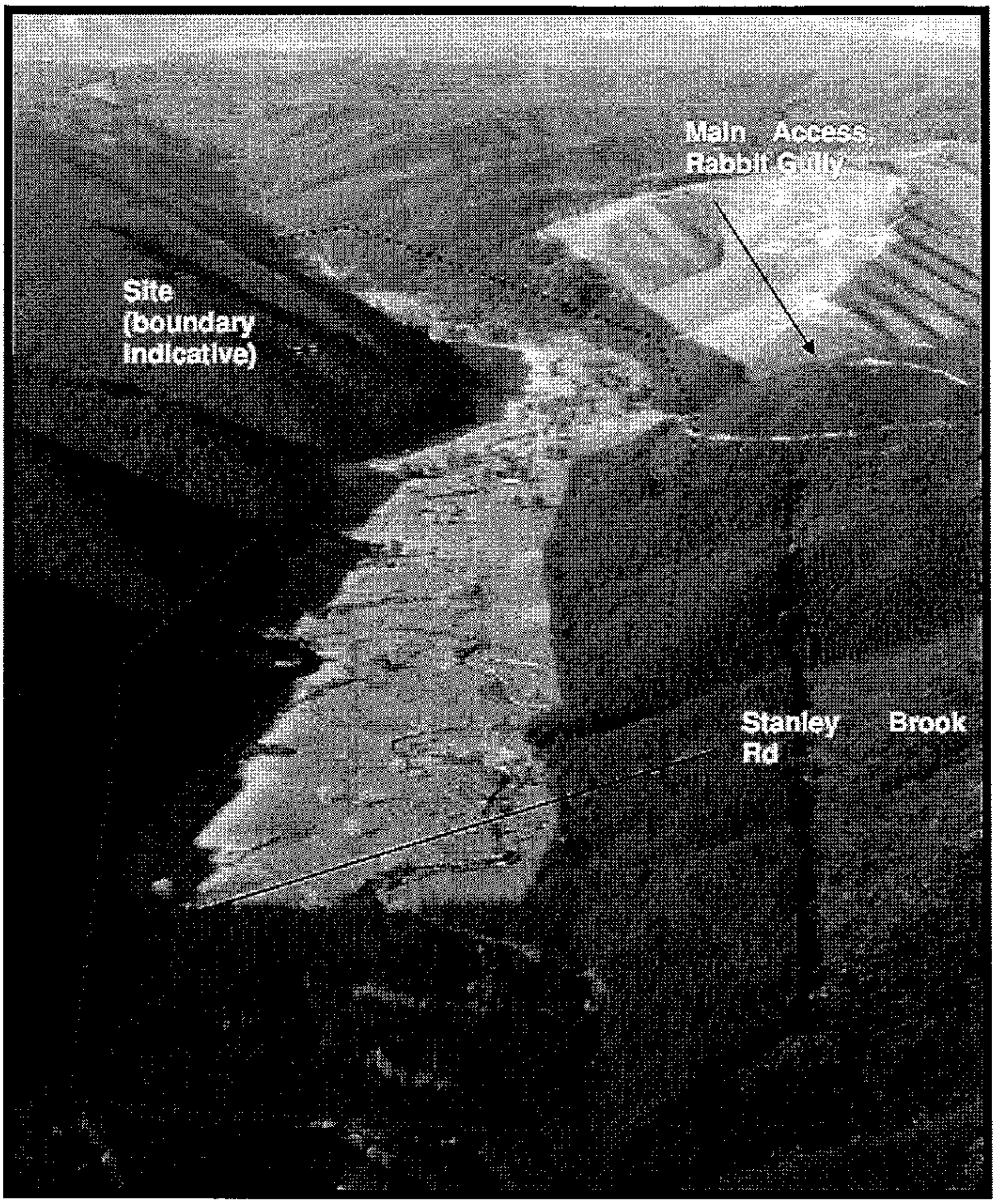

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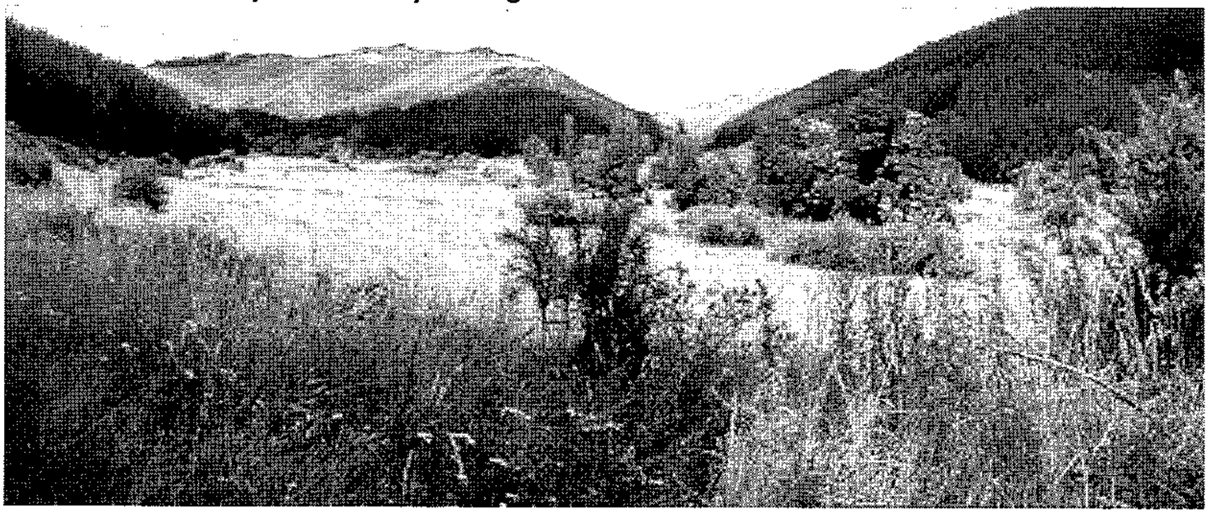

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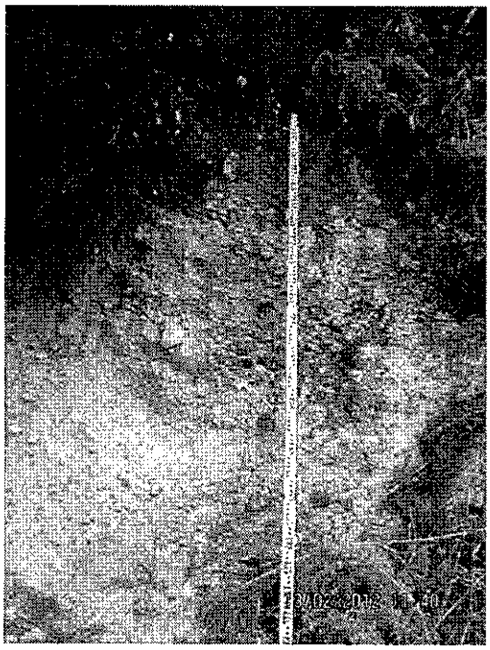

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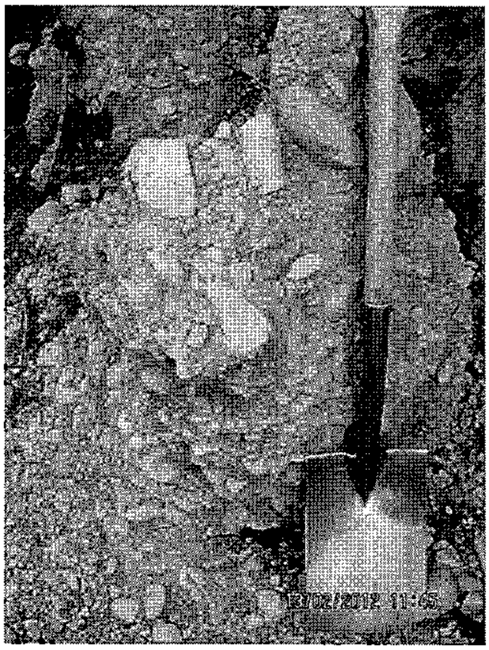

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