PRELIMINARY SITE INVESTIGATION

JOB NUMBER: 23-1883

Waikato Thoroughbred Racing Greenfield Hub
PROJECT

Waikato Thoroughbred Racing
CLIENT

Referral – REV 1
16 April 2026

Preliminary Site Investigation Report

23-1883 Waikato Thoroughbred Racing New Racecourse – Pencarrow Road



Prepared for: Waikato Thoroughbred Racing **Project no:** 23-1883

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EXECUTIVE SUMMARY

BCD Group has been engaged by Waikato Thoroughbred Racing to assist with the Master planning for a proposed development on Pencarrow Road, Tamahere. As activities covered by the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (2011) are proposed for the Site, a Preliminary Site Investigation was undertaken by BCD to inform the planning process and potentially support a fast-track resource consent referral application.

This report is subject to, and must be read in conjunction with, the limitations set out in Section 10.

	Item	Comments
Our key findings	Activities on the HAIL	The following potential activities on the HAIL have been identified as potentially present at the Site - Agrichemical storage and use at the Site - Fuel storage at the Site - Treated timber pile storage - Presence of a farm dump and offal pits - Burn pile
	Non-HAIL activities	Impacts from weathering of building fabric at the Site may have impacted soils in the building halo. Sampling undertaken as part of the investigation did not identify potential impacts from potential application of superphosphate at the Site
	Soil sampling	A total of 42 samples were collected from 14 locations across the Site. Sampling targeted the top 1.5 m of soil profile in the paddocks at the Site to gain an understanding of the wider soil conditions across the Site.
	Assessment against screening criteria	Samples were assessed against commercial / industrial and rural residential health criteria. One sampling location exceeded the rural residential guidelines. This sample was vertically delineated but not horizontally delineated.
	Disposal implications	Waikato Regional Cleanfill concentrations were exceeded in one location. The remaining areas are potentially acceptable as cleanfill.
	Consenting requirements	Due to the presence of activities on the HAIL at the Site a consent under the NES CS will be required. Currently this would be regarded as a discretionary activity. If remediation of the Site is found to be required a discharge consent from Waikato Regional Council will potentially be needed.
	Data gaps	There is currently no understanding of the impacts of the activities on the HAIL identified at the Site. This will require further sampling and assessment to quantify and assess the risk. There is currently no understanding of the impacts of the buildings at the Site. This will require further sampling and assessment to quantify and assess the risk and inform disposal requirements for stripped topsoil in these areas. This work can be undertaken as part of any future Substantive Application for the works at the Site.
Recommendations	Further work	To support a substantive application further sampling should be undertaken to assess the identified data gaps, and a contaminated site management plan should be prepared to manage and mitigate the potential risks at the Site. When implemented, these mitigations and management practices will mitigate identified impacts of the Site to a level appropriate for the proposed land uses. This work can be undertaken as part of any future Substantive Application for the works at the Site.

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1 INTRODUCTION

1.1 Background

BCD Group have been engaged by Waikato Thoroughbred Racing (WTR) to undertake a Preliminary Site Investigation (PSI) of the farmland properties where the development is proposed, located at Pencarrow Road, Tamahere, Waikato (the Site). The Site location is show in **Appendix A**.

The purpose of the Project is to create a unique, world class greenfield racing hub designed for horse training, racing and other equine related activities, while bringing the expertise and strength of the local racing fraternity together in a centralised location.

This enables the local racing industry to be more streamlined, competitive, sustainable and future focused while bringing potential international investment and creating a 'destination' for horse racing in New Zealand, also increasing tourism opportunities for the wider region.

A key driver behind the proposed greenfield equine hub and racecourses is enabling the consolidation of four separate racecourse facilities (Te Rapa, Waipa and Cambridge thoroughbred courses, and the Cambridge harness track).

These facilities duplicate assets and resources and, given their current condition require significant levels of upgrades and investment to provide fit-for-purpose facilities that meet the higher standards of the modern-day racecourse experience. The retirement of these areas also frees up significant tracts of land within existing urban areas for future development, increasing housing supply.

To support the development's financial viability and enhance the site's long-term vibrancy as a racing, entertainment, commercial and community precinct, the proposal includes a range of complementary activities on the remaining land. These include equine support services, rural residential housing developments, a retirement living community, a village centre and a bloodstock sales precinct

Masterplans for the Site are included in **Appendix B**. This plan shows:

- A main track, backtrack, warmup track and harness track
- Stabling and support areas for events
- Carparking
- Commercial and residential development
- Irrigation ponds

Earthworks across the Site will be required for:

- Excavation of the irrigation pond
- Stripping of topsoil and levelling of the Site
- Recontouring of the Site
- Demolition of existing structures at the Site
- Construction of foundations
- Development of roads and other surface infrastructure
- Development of subsurface infrastructure.

Depths of excavations, earthworks staging and excavation methodology are currently unknown. Currently an indicative approximation of earthworks puts cut and fill volumes at 37,000 m^3 and 30,000 m^3, with a maximum cut depth of 4 m and a maximum fill depth of 3 m. In addition to this cut and fill, a 300,000 m^3 cut may be required for the removal of topsoil and 40,000 m^3 fill for the infilling of drains. The final site cover will vary across the Site and will include racetrack, grassed areas and impermeable surfaces. In addition to earthworks, changes of land use and subdivision of the Site will occur as part of the redevelopment.

As activities regulated under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (2011) (NES CS) are proposed for the Site, a resource consent under the NES CS may be required. Under the NES CS, a PSI can be used to establish whether the NES CS applies to this site by showing whether, or how likely it is that the site has had activities on the Hazardous Activity and Industries List (HAIL)

undertaken on it (R6(3) of the NES CS), and where the "Piece of Land" where the activity on the HAIL occurred is located.

A PSI can also be used to manage project risk by identifying potential environmental risks that exist at a Site ahead of works. This allows the potential risks to be managed through quantification and appropriate management of these risks and inform disposal options for material excavated at the Site.

If activities on the HAIL are identified, then the "Piece of Land" should be assessed to quantify the potential risk to human and environmental health and assess the consenting requirements for the Site.

1.2 Purpose

The purpose of this investigation is to assess the site for the presence of activities on the HAIL and inform Waikato Thoroughbred Racing with information to support the design for the Site, and to support an application to the Fast Track consenting process.

1.3 Scope

Works are undertaken in accordance with the Short Form Agreement dated 12 November 2025 between BCD Group Limited and Waikato Thoroughbred Racing. The following scope of work has been undertaken:

- Undertake a review of background information about the Site, including regional council and district council files, historical aerial imagery and previous investigations
- Review readily available environmental data about the Site, including underlying geology, soil types, and hydrology and hydrogeology
- Undertake a site walkover and interview with property owners.
- Conduct general field sampling and field testing of soils to provide a benchmark of the current environmental conditions at the Site
- Develop a conceptual site model for the Site
- Assess the risks to human and environmental health at the Site

This investigation has been undertaken in general accordance with Contaminated Land Management Guidelines (CLMG) No 1 – Reporting on contaminated sites in New Zealand, and CLMG No 5 – Site Investigation and Analysis of Soils. BCD has undertaken the work under the guidance of a suitably qualified and experienced practitioner (SQEP) who is a certifier and signatory to this report.

1.4 Assumptions

The following assumptions were made during this report:

- Information obtained by Waikato Thoroughbred Racing and any third parties is complete and accurate
- The observations made during this investigation are representative of the activities that have occurred or are occurring within or adjacent to the Pencarrow Road site
- The observed and inferred conditions are representative of the actual conditions associated with HAIL sites and / or other sites not directly assessed
- That the future land use of the site will be commercial/residential and have used that land use when comparing to relevant guidelines

2 LEGISLATIVE CONTEXT

2.1 The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (2011)

The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (2011) (NES CS) regulates soil disturbance, soil sampling and changes in land use on pieces of land where HAIL activities have or are likely to have occurred (Ministry for the Environment, 2011).

Under the NES CS a PSI is one of the two methods used to assess if it is "more likely than not" that an activity on the HAIL has been undertaken at a site. If activities on the HAIL are identified at the Site, and activities regulated by the NES CS are undertaken on it, a consent under the NES CS may be required.

2.2 Waikato Regional Council

Section 5.3 of the Waikato Regional Plan concerns contaminated land in the Waikato region. Rules 5.3.4.6 to 5.3.4.8 relate to discharges arising from the remediation of contaminated land. If contamination is identified at the Site, then these rules may apply to future work at the Site.

2.3 Waikato District Council

Part 2 of the Waikato District Plan concerns contaminated land in the Waikato district. It includes an objective and policy to manage the use of contaminated land. No contaminated land specific rules are included in the plan.

3 SITE FEATURES

3.1.1 Site details

The Site fronts onto Pencarrow, Hooker and Duncan Roads, Tamahere, Waikato, approximately 8.3 km north-west of the Cambridge CBD. A map of the Site is included in **Appendix A**. Site information is included in Table 1 below.

Table 1: Site information

Attribute	Details
Address, Legal description and site area	37 Hooker Road and 38 Duncan Road, Tamahere, Hamilton Section 2 SO 547526 [RT 1027516] 69.6678 ha 90 Duncan Road, Tamahere, Hamilton Lot 2 DP 16925 [RT SA383/181] 14.212 ha 536 Pencarrow Road, Tamahere, Hamilton Lot 2 DP 471383 [RT 650204] 18.5194 ha 592 Pencarrow Road, Tamahere, Hamilton Lot 1 DP 471383 [RT 650205] 23.8694 ha 636 Pencarrow Road, Tamahere, Hamilton, Section 49 SO 457609 [RT: 632409] 37.6439 ha 644 Pencarrow Road, Tamahere, Hamilton Section 46 SO 457609 [RT 632392] 1.355 ha
Current owner	[redacted]
Regional council	Waikato Regional Council
Territorial authority	Waikato District Council
Zoning	Rural
Current site use	Agricultural production land
Proposed future site use	Racetrack development – this is anticipated to be a mixture of racing, commercial, recreational and residential land uses.
Site area	Total site area of approximately 1,655,000 m²

3.1.2 Site layout

The site consists of two farms, both with internal roading and drainage throughout. A map of the site layout is included in **Appendix C**.

The [redacted] property (defined as 90 Duncan Road and 37 Hooker Road and 38 Duncan Road) has the milking sheds, farm equipment storage, effluent treatment ponds, sileage storage and cattle yards towards the centre of the site. The access road to this infrastructure enters the site from the southeastern boundary, off Duncan Road. Two farmhouses are situated along the southern side of this road.

The [redacted] property (defined as 536, 592, 636 and 644 Pencarrow Road) has milking sheds, cattle yards, farm equipment storage sheds, sileage storage and farm housing located near the northwestern corner, accessed by a driveway off Pencarrow Road on the northeastern boundary. This property also has sheds and a dwelling to the west corner of site, also accessed off Pencarrow road, to the south of the main farm infrastructure.

Both properties are currently functioning dairy farms and have workers on site every day. The site cover mostly consists of pasture, with hedging along paddock fences, and a stand of Kahikatea trees within the southern property to the southwest of the farming infrastructure.

There is likely to be power and water services connecting to existing buildings at the Site.

3.2 Surrounding land uses

The surrounding land uses are summarised in Table 2 below:

Table 2. Surrounding land use

Direction	Land use
North	State Highway 1 runs along the northern boundary of the site. Beyond the highway is an Artificial Insemination (Reproduction Specialty Group (NZ) Limited) facility. Land use is primarily agricultural farmland and residential use.
East	Duncan road runs along the eastern boundary, with predominantly residential lifestyle blocks or small rural properties across the road.
South	Hooker road runs along the southern boundary, with predominantly residential lifestyle blocks or small rural properties across the road.
West	Pencarrow road runs along the eastern boundary, with predominantly residential lifestyle blocks or small rural properties across the road.

3.3 Environmental setting

3.3.1 Topography

The Site is generally level, with steeper slope angles towards the western boundary. The western side of the site has a hill sloping down to the east, with contours showing a difference in elevations between 59.5m and 55m RL (NZVD2016). The southeastern corner of the site is also slightly elevated at 57m RL.

3.3.2 Soils

The Landcare Research shows that the site is predominantly underlain by Typic Orthic Allophonic (LOT) soils, with an area of Typic Orthic Gley (GOT) soils intruding into the site from the eastern boundary. There are also Typic Orthic Granular (NOT) soils coming into the site across the western boundary. A Soil map is attached in Appendix D.

3.3.3 Geology

The 1:63,360 scale geological map (Kear, D. Schofield J. C. 1961) showing the underlying geology is attached in **Appendix D**.

The BCD Group geotechnical report (BCD Group, 2025) states that the underlying geology of the site primarily consists of the Hinuera Formation described as volcanogenic alluvium, comprised of cross-bedded sand, silt and gravel with interbedded peat. The Hinuera Formation is found throughout the Waikato alluvial plain and is typically deposited in a series of levees and swales of differing material composition representing the various depositional environments of the ancient, braided Waikato River system. (Lowe, 2010). There is also Walton Subgroup geology underlying the hill topography on the western side of the site. The low hills of the Waikato Basin consist of several meters of airfall tephra from multiple events, collectively termed the Hamilton Ash, which in turn overlies the pre-Hamilton Ash deposits collectively known as the Walton subgroup.

The BCD Group Geotechnical Assessment Report has been reviewed and the 14 hand auger investigations across the site found soils consistent with the underlying geology. Groundwater was encountered at varying depths between 0.9m to 2.8m below ground level (bgl) at the time of investigation in November.

3.3.4 Hydrogeology

Underlying aquifer and groundwater flow direction

Waikato Regional Council does not have a classification of sensitive aquifers in the Waikato Region.

In the absence of this, Section 5.2.3 of the Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand provides a definition of a sensitive aquifer. An assessment against this is shown in Table 3.

Table 3. Aquifer sensitivity assessment

Attribute	Assessment
Is the aquifer not artesian	Yes – the aquifer is not artesian
Less than 10 metres below the source of release?	Yes – groundwater at the Site was observed to range between 0.9 – 2.2 m bgl at the Site
Is the aquifer of a quality appropriate for use, capable of yielding water at a useful rate and where extraction and use can be reasonably foreseen	Yes – several groundwater takes are located at and around the Site.
Is the Site within 100 metres of a sensitive water body?	Yes – there is a potentially sensitive wetland located at the Site.

Based on this assessment the groundwater underlying the Site can be classified as potentially sensitive, and depending on the results of sampling additional assessment may be required.

The groundwater measurements undertaken as part of the BCD Geotechnical Report (BCD Group, 2025) indicate that groundwater underlying the Site is flowing to the North.

Boreholes

There are 44 bores within a 250m radius of the site, including the piezometers installed within the site by BCD Geotech team. These are shown on a map attached in **Appendix D**, along with a table showing more bore details.

Hydrogeological investigations

WGA has undertaken a Technical Memorandum (WGA, 2026) to support the abstraction of groundwater at the Site to supply potable water at the Site.

The report notes that groundwater in the area are generally characterised by elevated dissolved iron. It also states that groundwater from deeper bores is characterised by low nutrient concentrations. The report recommends that the deeper aquifers are targeted for water abstraction. The report also recommends undertaking the supply bore

to the north of the Site as is states that *"WGA are aware that there are deeper bore(s) to the south of the proposed development that have encountered groundwater with elevated saline levels. This is attributed to an outcrop of basement greywacke".*

3.3.5 Hydrology

The nearest major surface water body is the Waikato River, approximately 500 m to the south of the site. There is also an unnamed stream in the base of the gully running approximately 400 m to the north of the site. Within the site itself, there are multiple farm stormwater drains running along paddock boundaries. Due to the topography, it is likely that all stormwater concentrates from overland flow, into the formed farm drains, before flowing to the north.

3.4 Site walkover

A BCD environmental scientist undertook a walkover of both properties on 4 February 2026. A summary of the walkover is included in Table 4. Photos are included in **Appendix E.**

Table 4: Site walkover summary

Location	Area ID	Observation	Associated photographs
Duncan property			
Farm buildings	1	A cluster of three buildings (one cinderblock, one corrugated iron, and one a combination of powder coated corrugated sheeting and wood) and milking shed (cinder block)/feeding barn are located surrounding the main entranceway to the Site. A petrol tank is located adjacent to the powder coated shed, built over a concrete footing. No staining was observed on the footing. The tank had previously been adjacent to its current position. Small volumes of agrichemicals, paints and oils, as well as maintenance supplies for the farm (such as fencing materials) are stored in the wooden structure. The floor of this appears to be bare earth. Urea is stored in the powder coated shed extension, along with hay. A silage bunker is located here, constructed of concrete. Stockpiled soil is stored adjacent to this, including over the foundations of what appear to have previously been an adjacent bunker.	01 – 07
Effluent pond	2	Effluent from the Dairy shed waste drains to the ponds. From here effluent is spread across the farm.	08
Silage storage bunker	3	A silage bunker is present at the Site. The bunker is built of fences and posts with boarding, and a gravelled floor.	09
Paddock 36	4	Paddock 36 is used for waste disposal from the farm. A bit, with visible waste is in the south of the paddock. Several hummocks of soil are visible across the paddock. Three buildings are in this area, two appear to be used for the storage of building materials such as bricks and reclaimed wood. A stockpile of soil is included adjacent to a building.	10 – 14
Remainder of site	N/A	The remainder of the site operates as a farm, with drains and an internal roading network.	N/A
Montgomerie property			
Farm buildings	5	A cluster of buildings, including a storage shed, milking shed/feeding barn, and silage bunkers and feeding. Two refuelling areas have been identified, one adjacent to the shed (with one fuel tank of unknown contents, likely petrol) and one adjacent to the silage bunker (with one diesel tank, and one petrol tank).	15 – 18

		Stockpiles of soil were also observed in this area, as well as stockpiled fence posts. Chemical storage was observed in the storage shed, which had a concrete floor.	
Effluent ponds	6	Two effluent ponds are present at the Site. The dairy shed waste drains into these ponds, which are spread across the Site.	19
Pump shed	7	A pump shed is present in this location, with two water storage tanks.	20
Kahikatea stand	8	A stand of Kahikatea trees is present in this area. The remnants of a burn pile were observed.	21
Remainder of site	N/A	Two residential areas are located at the Site, including a house and shed. A small network of roads is present to service the paddocks	N?A

3.5 Ecological assessment

Awa Ecology has prepared an Ecological Impact Assessment (Awa Ecology, 2025) to assist the master planning of the Site.

The report identified a small Kahikatea stand with a small area of wetland, a network of artificial water courses and associated artificial wetlands.

Across most of the development the ecological value of vegetation and habitats *"range from negligible to low"*, however the Kahikatea stand was identified as potentially significant.

Fauna ecological values range from between low (indigenous birds and shortfin eel) to "threatened – nationally critical" for longtail bats.

4 HISTORICAL SITE USE

4.1 Regional council information

4.1.1 Contaminated land search

A request was lodged with WRC in October 2025 for a search of their Land Use Information Register for the Site and locations within 200 m of the Site. A copy of the request is included in **Appendix F**.

No records were held by WRC for the Site.

A property to the north of the Site, located on Strawberry Fields Lane on the opposite side of State Highway 1 has been included on the LUIR as Verified HAIL – A10: Persistent pesticide bulk storage or land use (unknown – present) associated with Strawberry Fields.

The WRC response states: *"very limited sampling included as part of Cambridge Expressway works. Reporting not sufficient to determine whether the land is or is not contaminated"*.

One sample was collected as part of an assessment undertaken by HEB construction and analysed for a metal suite and organochlorine pesticides (OCP). Metals results were all below applicable rural residential land use guidelines, and OCP were below laboratory limits of detection.

Based on the results of the sampling and the distance from the Site this activity is unlikely to have impacted soils underlying the Site.

4.1.2 Consents

A search of the Waikato Regional Council consents database was undertaken. The findings of that are included in Table 5.

Table 5 Identified consents

Consent type	Consent number	Description	On or off site?	Current consent?
Discharge – land	AUTH101611.01.01	Discharge effluent to land	On	Commenced 1998 – no recorded expiry date
Discharge – land	AUTH961230.01.01	Discharge effluent to land	On	Commenced 1996 – no recorded expiry date
Water take – ground	AUTH130351.01.02	Water take consent	On	Commenced 2014 – expires 2029
Water take – ground	AUTH133770.01.01	Water take consent	On	Commenced 2015 – expires 2030

In addition to these consents, there are seven consents around the Site for the installation of groundwater monitoring wells. These were installed as part of the geotechnical investigation for this project (BCD Group, 2025).

No resource consents which may be impacting the Site were identified within 200 m of the Site boundaries.

4.2 Waikato District Council Contaminated Land Search

A request was lodged with WDC for the results of a search of their HAIL database. A copy of the results are included in **Appendix F**.

No records of activities on the HAIL have been identified at the Site. A western portion of the Site is identified on the WDC internal database as subject to a subsidence hazard and an activity listed on the HAIL. No details are held on what the HAIL activity is and communications with WDC indicate that may have been included in error.

4.3 Historical aerial imagery

Historical aerial imagery of the Site between 1939 and 2024 was sourced from RetroLens and GoogleEarthPro to assess potentially contaminating activities at the Site. The findings of this assessment are outlined in Table 6. A copy of the aerial imagery is included in **Appendix G**

Table 6: Historical aerial review

Year	Source	Onsite comments	Offsite comments
1939	Retrolens	Both properties appears to be in pastural land use. Several small structures sheds and animal pens can bs observed around the Site. Bare patches of soil, likely from animal tracking can be observed.	The area is mostly being used for pastural farming.
1953	Retrolens	[redacted] property – Main driveway to farm sheds is already established, some farm sheds on site. [redacted] property – Some farm sheds/dwellings are present in the northern corner, and along the western boundary. Drains are established through the Site.	No large noticeable changes.
1957	Retrolens	[redacted] Property farm sheds are being added to, with driveways etc constructed.	No large noticeable changes except general residential growth.

		[redacted] Property – main farm race constructed	
1967	Retrolens	[redacted] properties farm tracks increasing in access to paddocks across the property.	No large noticeable changes except general residential growth.
1979	Retrolens	No large noticeable changes.	Property across the northern boundary over the SH1 has been developed.
1995	Retrolens	Kahikatea stand in [redacted] property has decreased in size. Some of the buildings present at the Site have been removed.	State highway to the northwest of the property is being developed.
2014	Google Earth	No large noticeable changes.	Waikato expressway has started to be constructed along northern boundary.
2023	Google Earth	[redacted] Property farm buildings constructed new shed, or cattle cover alongside main driveway	No large noticeable changes.

The Site has been in pastural farming since before 1939, with farming buildings and driveways introduced in the [redacted] and [redacted] properties between 1953-1957. Farm tracks were constructed for both properties in 1967. By 1995 some of the buildings historically present at the [redacted] Property have been demolished.

No livestock dips, large scale earthworks or farm dumps are observed in the photographs.

Since 1957, residential development has occurred surrounding Site. In 2014 the construction of the Waikato Expressway can be observed.

4.4 Landowner interviews

A questionnaire was sent to both landowners asking about activities, farming practices and the environmental history of the Site. The owners of the Montgomerie property replied via email. The owners of the [redacted] property responded in person. A map, showing the locations of the Offal Pits on the [redacted] Farm are included in **Appendix G.**

Responses are summarised in Table 7 and Table 8.

Table 7 [redacted] Farm

Topic	Response
General information	The owners have owned the farm for the past 65 years. Prior to this it was owned by the [redacted] Family. Buildings were previously at the Site (constructed between 1920s – 1940s) and then demolished between 1990 – 2000.
Farming practices	Over the past 25 years very little phosphorus and potassium, and average levels of nitrogen and sulfur have been added, with Lime added as required. These are spread via a tractor. No pesticides are applied at the Site, with MCPA applied via a boom sprayer. No livestock dips are known to have operated at the Site. Farm effluent is used across the Site as fertiliser.
Waste management and agrichemicals	No chemical spills have occurred at the farm. A map showing the position of offal holes at the farm was provided. A chemical shed is located next to the silage bunker, containing roundup, conquest, preside, projib, and MCPA based agrichemicals.
Environmental testing	It is unknown if asbestos is present in any buildings at the farm. Agricultural testing has been undertaken at the Site. Sampling was undertaken from an unknown water source at the Site and analysed for a routine water profile. Water exceeded Maximum Acceptable Values for Manganese and Nitrate-N. Groundwater pH was 6.4.

Table 8 [redacted] Farm

Topic	Response
General information	The [redacted] family has owned the property for many years.
Farming practices	Minimal fertiliser has been placed at the Site in the past 5 – 10 years Some pesticide use occurs at the Site – "mostly RoundUp" Effluent is spread across the site.
Waste management and agrichemicals	There is a burn pit located in Paddock 36. Waste from the farm is placed into holes, and set on fire and buried. Agrichemical drums are generally cut in half and used for calf feeding.
Environmental testing	No environmental testing had been undertaken at the Site.

5 PRELIMINARY SOIL SAMPLING

5.1 Sampling and analysis plan

A programme of soil sampling was undertaken at the Site during the geotechnical investigation. The objective of this assessment was to benchmark the top 1.0 m bgl of soils at the Site in areas where farming had occurred, away from areas where activities on the HAIL may have impacted soils.

This assessment informs:

- The concentrations of cadmium and organochlorine pesticides (OCP), specifically DDT, which may have impacted the Site during topdressing with superphosphate fertiliser.
- The potential background concentrations in the area.
- The management requirements for earthworks in the areas where activities on the HAIL had not been identified.

Samples were collected from 15 sampling locations via hand auger from the near surface (between 0.0 – 0.2 m bgl), shallow soils (0.2 – 0.5 m bgl) and at depth (between 0.5 – 1.0 m bgl). All samples were assessed for metals, with surface samples analysed for organochlorine pesticides (OCP). If OCP were identified in the surface soils additional analysis of deeper samples was scheduled to assess if deeper impacts were present.

Samples are to be analysed at an IANZ accredited laboratory capable of undertaking the analysis to an appropriate limit of detection.

Adopted screening criteria for the results of the sampling are included in Table 9 below. Human health screening criteria were selected based on the proposed future uses of the Site – commercial / industrial for workers or short-term residents such as people staying at a hotel at the Site, and rural residential for the redevelopment of areas of the Site into lifestyle blocks.

Table 9: Screening criteria

Criteria	Contaminants of concern	Screening criteria and proposed land use
Human health	As, Cd, Cr, Cu, Pb, Total DDT	NES CS SCS – Rural Residential and Commercial / Industrial
	Ni, Zn	Health Investigation Levels Residential and Commercial / Industrial HIL A and D
Background concentrations	As, Cd, Cr, Cu, Pb, Hg, Ni, Zn	Waikato regional council background concentrations
Disposal criteria	Metals, Total DDT	WasteMINZ Class 3 landfill Waikato regional cleanfill concentrations

5.2 Summary of sampling works

Samples were collected between 10 – 14 November 2025 by two BCD Environmental Scientists. A total of 42 samples were collected from 14 sampling locations. A map showing the sampling locations is included in **Appendix I**.

Samples were collected in line with the sampling and analysis plan (SAP) outlined in Section 5.1. One sampling location (HA 09) was removed due to access requirements. BCD considers that this change is comparatively minor and the information provided by the remaining sampling locations is sufficient to fulfil the goals of the SAP.

Underlying soils generally comprised of topsoil, underlain with silts overlaying interbedded sands and silts. Hand auger logs are included in **Appendix I**.

No visual or olfactory indicators of contamination were encountered during the field investigation. No potentially asbestos containing material was observed during the investigation. Based on the field observations no additional sampling was recommended.

Samples were collected with the use of a hand auger. Samples were placed directly into a laboratory supplied container and placed into an iced chilly bin. Samples were delivered directly to Hill Labs, an IANZ accredited laboratory, under standard BCD chain of custody protocols. Sampling was scheduled in line with the SAP.

Sampling equipment was cleaned with a mixture of Decon90 and water, and rinsed with water, between sampling locations.

5.3 Results

Full laboratory certificates and tabulated results are included in **Appendix J**.

Exceedance of the screening criteria discussed in Table 9 are outlined below in Table 10.

Table 10: Criteria exceedances

Exceeded criteria	Contaminant of concern	Location	Depth (m bgl)
NES CS Rural Residential (25% produce)	Arsenic	HA 12	0.3
Waikato Background Concentrations	Arsenic	HA 12	0.3
	Copper	HA 06	All depths
	Lead	HA 06	0.4, 1.0
	Mercury	HA 06	0.4
		HA 08	0.3
	Nickel	HA 06	All depths
	Zinc	HA 06	1.0
Waikato Cleanfill Acceptance Criteria	Arsenic	HA 12	0.3

One sampling location, HA 12, had an exceedance of the adopted screening criteria for human health (rural residential land use, 25% produce consumption), adopted background criteria and Waikato region cleanfill concentrations. This was vertically delineated in the shallower soils, but not horizontally delineated.

Samples from HA 06 and 08 showed exceedances of adopted background concentrations for one of copper, lead, mercury, nickel or zinc. These were not fully vertically or horizontally delineated.

No sampling locations had an exceedance of WasteMINZ Class 3 Acceptance Criteria. Organochlorine pesticides were all below laboratory limits of detection.

5.4 Quality assurance / quality control

Sampling was undertaken under the supervision of a SQEP.

Hill Labs, an IANZ accredited laboratory, was selected for analysis of the samples. Analysis was undertaken in accordance with the terms of accreditation. Samples were transported to the laboratory under standard BCD chain of custody protocols and were analysed within laboratory holding times.

Based on this the sampling programme can be regarded as acceptable for the assessment.

6 RISK ASSESSMENT

6.1 HAIL activities

6.1.1 Identified HAIL activities

Table 11 below outlines the activities on the HAIL which have been identified at the Site. A Map showing these locations is included in **Appendix K**. Associated contaminants of concern have been sourced from the Hazardous Activities and Industries List guidance Identifying HAIL land (Ministry for the Environment, 2023)

Table 11 Identified HAIL activities

HAIL ID	Activity description	HAIL classification	Evidence source	Associated contaminants of concern	Discussion
01	Farm dump located in Paddock 36 of the [redacted] property	G3 – Landfill sites	Site walkover, interview	Metals, hydrocarbons, asbestos, OCP and semi-volatile organic compounds	A farm dump has been identified in paddock 36 of the [redacted] fam. The impacts of this have not been assessed.
02	Storage shed and fuel tanks	A1 – Agrichemicals, including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application A17 – storage tanks or drums for fuel, chemicals or liquid wastes	Site walkover, interview	Metals, hydrocarbons	The shed at the Site is used for agrichemical storage. In addition, an above ground storage tank is located beside the shed, and has historically been located adjacent
03	Vehicle shed	A1 – Agrichemicals, including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application A17 – storage tanks or drums for fuel, chemicals or liquid wastes A18 – Wood treatment or preservation including the commercial use of antisapstain chemicals during milling, or bulk storage of treated timber outside.	Site walkover, interview	Metals, hydrocarbons	The workshop at the Site is used for the storage of agrichemicals, as well as the AST located adjacent to the shed and storage of treated timber piles.
04	Offal pit	G3 – Landfill sites	Interview	Metals, hydrocarbons, asbestos	Offal pits have been identified at the Site. While these have primarily been used for the disposal of animal carcasses, there is

					the potential that non-animal waste has been disposed of here.
05	Offal pit	G3 – Landfill sites	Interview	Metals, hydrocarbons, asbestos	Offal pits have been identified at the Site. While these have primarily been used for the disposal of animal carcasses, there is the potential that non-animal waste has been disposed of here.
06	Offal pit	G3 – Landfill sites	Interview	Metals, hydrocarbons, asbestos	Offal pits have been identified at the Site. While these have primarily been used for the disposal of animal carcasses, there is the potential that non-animal waste has been disposed of here.
07	Fuel storage tanks	A17 – storage tanks or drums for fuel, chemicals or liquid wastes	Site walkover, interview	Hydrocarbons	The historic and use of hydrocarbons on the Site may have impacted the underlying soils.
08	Burn pile	I – Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment	Site walkover	Metals, PAH	Impacts from the fire may have impacted the soils underlying the burn pile

6.1.2 Other potential issues

In addition to the activities on the HAIL identified at the Site, there are a set of other, non-HAIL activities which may have impacted the underlying soil which should be considered. These are outlined in Table 12.

Table 12: Other potentially impacting activities

Activity	Release mechanism	Associated contaminants of concern	Discussion
Building fabric with potentially asbestos containing material	Potentially asbestos containing material was identified on the walls and eaves in the buildings at the Site	Asbestos	Due to the age of the buildings at the Site asbestos may be present in the building fabric of existing and demolished buildings at the Site.
Painted metals, treated timber, galvanised building fabric	Weathering of building materials such as paint, treated timber, and galvanised metals.	Metals, including arsenic, lead, zinc, copper, chromium	Building fabric may be impacting the soils at the Site.
Superphosphate application	The Site may have been subject to the application of superphosphate fertilisers	Cadmium, DDT	Based on the high-level soil sampling programme impacts from cadmium or DDT were not observed in the soil at the Site.
Effluent discharges	Effluent has been applied to the soils at the Site.	Nitrates, e.coli	Nitrates and e.coli are unlikely to impact the health of workers at the Site, especially if PPE is in place while undertaking work at the Site. However, if dewatering is required for works at the Site further assessment should be undertaken to quantify the potential risk from the dewatering.

6.1.3 Discounted HAIL activities

Given the farming history of the Site, the presence of livestock dips was assessed. No dips were identified in the historical aerial review, and both property owners stated during the interviews that no dips had been present at the Site.

The effluent ponds on the Site only accept animal waste. The HAIL Guidance describes HAIL category G5 – Waste disposal to land as:

"Agricultural spreading of animal effluents (eg, dairy shed effluent) or manure where normal animal husbandry practices are not expected to result in contamination of effluent or manure. Note: piggery effluents may contain elevated concentrations of copper and zinc, and historically chicken manure could contain arsenic compounds."

Based on this the effluent ponds have been discounted as an activity on the HAIL for this investigation (although has been noted as a potential impact at the Site in Table 12.

6.2 Preliminary conceptual site model

6.2.1 Sources

The PSI has identified soils impacted by discharges from the activities on the HAIL potentially identified at the Site.

6.2.2 Pathways

Potential pathways at the Site are

- Soil ingestion, via inhalation of impacted dust or through hand to mouth soil ingestion.
- Direct dermal contact with impacted soils and exposure through the skin
- Impacts on the soil percolating through the soil profile or from overland flow paths from sediment.

These pathways are consistent with the exposure scenarios for a rural residential and commercial/industrial land use outlined in the document *"Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health"*.

6.2.3 Receptors

The following receptors have been identified at the Site

- Workers undertaking excavation and construction work during redevelopment of the Site
- Current and future site users, including workers and future residents
- Horses at the Site
- Other ecological receptors, such as water bodies or groundwater.

6.2.4 Conceptual site model

The Conceptual Site Model outlines the potential source – pathway – receptor linkages which may be present at the Site, and an assessment of complete or potentially complete linkages. A risk is only present if there is a complete source pathway receptor linkage. for the Site is laid out in Table 13.

Table 13: Conceptual site model

Source	Contaminants of concern	Pathway	Receptors	Discussion	Complete SPR?
Impacted soil from the HAIL activities undertaken at the Site	Metals	Ingestion and dermal contact Migrations of contaminants from soil into water or groundwater	Site workers	Site workers may come into direct contact with soils at site during excavation works. Implementation of PPE and worker hygiene procedures will assist in protecting from this.	Potentially complete
			Future site users	Future site users may encounter impacted soils when visiting the site or ingesting food grown at the Site or groundwater extracted from the Site.	Potentially complete
			Onsite ecological receptors	Ecological receptors may ingest impacted soil through eating grass or other food spread on the ground or ingest groundwater extracted from the Site.	Potentially complete
			Receiving environment	Impacted sediment from the Site may enter waterways or percolate through the soil profile into the underlying groundwater.	Potentially complete
	Hydrocarbons / semi-volatile organic compounds	Ingestion and dermal contact Migrations of contaminants from soil into water or groundwater Inhalation	Site workers	Site workers may come into direct contact with soils at site during excavation works. Implementation of PPE and worker hygiene procedures will assist in protecting from this. If hydrocarbon vapours are present at the Site these may collect in excavations or otherwise expose workers to potential risk.	Potentially complete
			Future site users	Future site users may encounter impacted soils when visiting the site or ingesting food grown at the Site, groundwater extracted from the Site or from hydrocarbon vapours.	Potentially complete
			Onsite ecological receptors	Ecological receptors may ingest impacted soil through eating grass or other food spread on the ground or ingest groundwater extracted	Potentially complete

				from the Site, or inhalation of hydrocarbon vapours.	
			Receiving environment	Impacted sediment from the Site may enter waterways or percolate through the soil profile into the underlying groundwater.	Potentially complete
	OCP	Ingestion and dermal contact Migrations of contaminants from soil into water or groundwater	Site workers	Site workers may come into direct contact with soils at site during excavation works. Implementation of PPE and worker hygiene procedures will assist in protecting from this.	Potentially complete
			Future site users	Future site users may encounter impacted soils when visiting the site or ingesting food grown at the Site or groundwater extracted from the Site.	Potentially complete
			Onsite ecological receptors	Ecological receptors may ingest impacted soil through eating grass or other food spread on the ground or ingest groundwater extracted from the Site.	Potentially complete
			Receiving environment	Impacted sediment from the Site may enter waterways or percolate through the soil profile into the underlying groundwater.	Potentially complete
	Asbestos	Inhalation	Site workers	Site workers may mobilise asbestos during the work and inhale mobilised fibres.	Potentially complete
			Future site users	If asbestos is present in the near surface asbestos fibres may be mobilised.	Potentially complete

6.3 NES CS applicability

As per Section 6 (3) of the NES CS, a PSI report is a method to assess if a site is regarded as a "piece of land" as described in Section 5 (7). Section 5 (2)-(6) describes activities which are regulated by the NES CS on pieces of land. An assessment of the applicability of the NES CS is below in Table 14.

Table 14: NES CS applicability

NES CS requirement	Applicable to the Site?
Is an activity described on the HAIL currently being undertaken on the piece of land?	Yes – activities on the HAIL have been identified at the Site.
Has an activity described on the HAIL been undertaken on the piece of land?	
Is it more likely than not that an activity described in the HAIL is being or has been undertaken on it?	
Activity assessment	
Removing or replacing an underground fuel system?	No – no underground fuel systems have been identified at the Site
Soil sampling	Yes – soil sampling will be undertaken as part of future assessment at the Site
Disturbing the soil	Yes – earthworks will be occurring across the Site

Subdividing land	Potentially – subdivision of the property may occur.
Changing land use?	Yes – the property is being converted from a production agricultural land use to a combination of commercial / industrial, recreational and rural residential.

Based on the findings of this PSI, activities on the HAIL have been identified as having occurred on the piece of land. If the activities outlined in the NES CS are undertaken at the Site, the NES CS will apply.

6.4 Other council requirements

As discussed in Sections 2.2 and 2.3, no other contaminated land specific consenting requirements have been identified at the Site. If the results of further testing at the Site shows that remediation is required, further assessment under the WRC plan will be required.

7 CONCLUSIONS

7.1 Summary of works

BCD Group has undertaken a preliminary site investigation of the proposed Waikato Thoroughbred Racing development. This included a review of the environmental data and background information about the Site, and undertaking a limited high level soil sampling programme.

This assessment identified activities on the HAIL as occurring at the Site, and therefore the NES CS applies if activities regulated by the NES CS are undertaken on the Site as part of the development. It also identified that the pastural production areas of the Site tended to be at or below background concentrations for metals and OCP.

7.2 HAIL activities identified

The following potential activities on the HAIL have been identified as present at the Site

- Agrichemical storage and use at the Site
- Fuel storage at the Site
- Treated timber pile storage
- Presence of a farm dump and offal pits
- Burn pile

7.3 Other potential impacts

There have potentially been impacts from the weathering of the building fabric of the existing buildings at the site, potentially releasing asbestos and metals such as lead, zinc, copper and chromium.

No impacts from any potential application of superphosphate at the Site were identified. Effluent discharges were identified at the Site; however, this is likely only relevant to groundwater and potential discharges.

7.4 Impacts on development

7.4.1 Consenting

Currently the works would require a discretionary activity under the NES CS, as HAIL activities have been identified at the Site but the potential risk to human and environmental health has not been quantified. A contaminated site management plan, including a programme of soil sampling across the Site once design is confirmed, should be provided as part of the substantive application for this project to manage potential effects from the development of the Site. This would allow for the quantification of these potential effects, and, as required, the implementation of mitigation measures for these effects by the appropriate management of contaminants. This would lead to a positive environmental outcome via the removal of impacted materials at the Site.

Subject to any ground works being undertaken in accordance with an appropriate contaminated soil management plan and remediation action plan, any adverse contamination effects can be adequately mitigated through standard contaminated soil management and mitigation methodologies and appropriate conditions of consent.

7.4.2 Disposal costs

Based on the results of sampling, much of the soil from the Site appears to be acceptable for reuse across the Site, if it meets geotechnical requirements. If excavated soils can be reused at the Site it will significantly decrease the cost of disposal of material during the works, as well as improve sustainability and waste minimisation outcomes.

If excavated soils are being removed from the Site, then they are likely to be acceptable as cleanfill in the Waikato region. Some areas which exceed the cleanfill criteria may, such as surrounding HA 12, may require delineation to minimise the volume of soils removed to managed fill, minimising costs associated with disposal of the material.

Alternatively, these soils may be suitable for soil mixing at the Site, where soils with higher concentrations of contaminants are mixed with soils with lower concentrations to bring them below applicable cleanfill criteria, and thus reducing the costs of offsite disposal of the material.

Options for the reuse and offsite disposal options should be outlined as part of a CSMP for the Site.

7.5 Data gaps

The following data gaps have been identified during this assessment which will need to be assessed as part of a substantive application:

There is currently no understanding of the impacts of the activities on the HAIL identified at the Site. This will require further sampling and assessment to quantify and assess the risk.

There is currently no understanding of the impacts of the buildings at the Site. This will require further sampling and assessment to quantify and assess the risk and inform disposal requirements for stripped topsoil in these areas.

8 RECOMMENDATIONS

Based on report it is recommended that a CSMP is prepared as part of a substantive application to manage the environmental risks ahead of the works, including a framework for undertaking additional sampling to quantify the risks once building layouts are confirmed and anticipated soil disturbance areas are identified to address the data gaps identified at the Site.

9 SQEP STATEMENT

I David Jackson of BCD Group certify that:

- This site investigation meets the requirements of the Resource Management (National Environmental Standard for assessing and managing contaminants in soil to protect human health) Regulations 2011 because it has been:
    - Undertaken by a suitably qualified and experienced practitioner, and
    - Reported on in general accordance with the current edition of Contaminated Land Management Guidelines No 1 – Reporting on contaminated sites in New Zealand,
    - Investigations have been undertaken in general accordance with the current edition of Contaminated Land Management Guidelines No 5 – Site investigation and analysis of soils, and
    - The report is certified by a suitably qualified and experienced practitioner.

10 REPORT LIMITATIONS

This document is prepared by BCD Group Limited (BCD) for WTR (the Client) for the limited purposes described in this document. BCD accepts no liability if the document is used for a different purpose or if it is used or relied on by another person. Any such use or reliance will be solely at their own risk.

This report has been prepared by BCD based on information provided by the Client and other third parties. BCD has not independently verified the information and has relied upon it being accurate, complete, and sufficient for use by BCD in preparing the report. BCD accepts no responsibility for errors or omissions in, or the currency or sufficiency of the provided information.

This document has been prepared based on observations of the site vicinity, review of third-party information, desktop review of historical aerial photographs and analysis of selected soil samples. The soil samples were analysed by an analytical laboratory for selected metals and organochlorine pesticides. The Site conditions as described in this document have been interpreted from and are subject to this information and its limitations, and accordingly, BCD does not represent that its interpretation accurately represents the full site conditions.

Laboratory test results provide an approximation of the concentration of the tested analytes and are subject to the inherent limitations of the laboratory techniques used for the tests. Interpretations of subsurface conditions, including contaminant concentrations, are not guaranteed at distances away from the specific points of sampling.

11 REFERENCES

Awa Ecology. (2025). *Ecological Impact Assessment for Waikato Thoroughbred Racing at Pencarrow Road, Tamahere.* Kirikiriroa: Awa Ecology.

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WGA. (2026). *Outline of hydrogeological assessment for fast track.* Hamilton: WGA.

Appendix A Site location



Client: WAIKATO THOROUGHBRED RACING — TE AWA · CAMBRIDGE · WAIPA

Contractor:

BCD GROUP

Sheet: Site Location

Project Title: Waikato Thoroughbred Racing
Pencarrow, Hooker & Duncan Roads

Revision	Date	By	Reason
01	12/12/2025	SL	Master Planning

Drawn: SL
Engineer: SL
SCALE: N/A
At: A3
Job Number: 23-1883
Sheet Number:
Revision: 01

All dimensions to be verified on site before making any shop drawings or commencing any work

The copyright of this drawing remains with BCD Group



Notes:
Elevation Contours are in terms of NZVD2016, generated using QGIS based on 2021 Lidar sourced from LINZ.
Aerial imagery, property boundaries, etc sourced from LINZ.

Client: WAIKATO THOROUGHBRED RACING — TE AWA · CAMBRIDGE · WAIPA

Contractor:

BCD GROUP

Sheet: Internal Infrastructure

Project Title: Waikato Thoroughbred Racing
Pencarrow, Hooker & Duncan Roads

Revision	Date	By	Reason
02	27/02/2026	BB	Fast Track Referral Application
01	12/12/2025	SL	Master Planning

Drawn: SL
Engineer: SL
SCALE: 1000
At: A3
Job Number: 23-1883
Sheet Number:
Revision: 02

All dimensions to be verified on site before making any shop drawings or commencing any work

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Appendix B Site masterplans

DESIGNGROUP STAPLETON ELLIOTT + COX

WTR WAIKATO THOROUGHBRED RACING
WTR GREENFIELDS RACECOURSE

FAST TRACK REFERRAL APPLICATION

Issued for Fast Track Referral Application
Version 01 • April 2026 • For Review

COX designgroup stapleton elliott

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1

OVERALL SITE

1.1 LOCATION PLAN

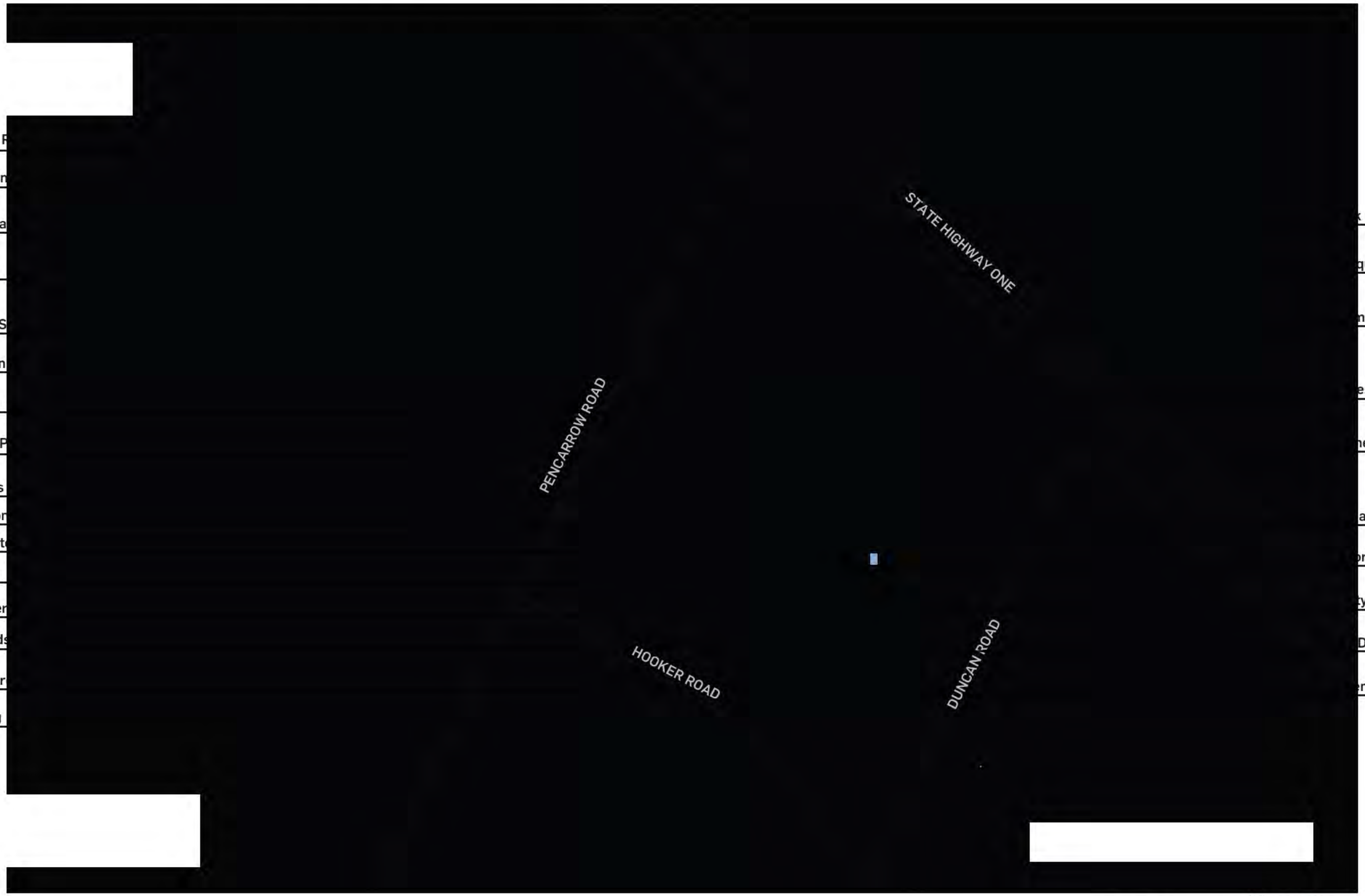


1.2 EXISTING SITE PLAN



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1.3 INDICATIVE PROPOSED SITE LAYOUT PLAN



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1.4 INDICATIVE COMMERCIAL ZONES

N

1	**Commercial Equire Services**	Area ~26,500m2 GFA – 18,000m2. Max 2 floors
2	**Bloodstock**	Areas ~63,200m2 GFA – 20,000m2. Max 2 floors
3	**Village Centre**	Area - 15,000m2 GFA - 15,000m2. Max 4 floors
4	**Training Areas**	Area ~150,000m2 GFA - 100,000m2. Max 2 floors
5	**Rural Residential Development**	Area ~153,600m2 40-50 2,500m2 Lots GFA per lot 800m2. Max 2 storey buildings
6	**Comprehensive Residential Development for Senior Living**	Area ~68,000m2 70 Villas @ average 100m2 GFA - 7,000m2. Single storey 200 apartments @ average 50m2 GFA – 10,000m2. Max 4 floors Community Centre GFA - 500m2. Max 2 floors

All figures are approximate. Indicative only.



1.5 PROPOSED SITE PLAN
RENDER

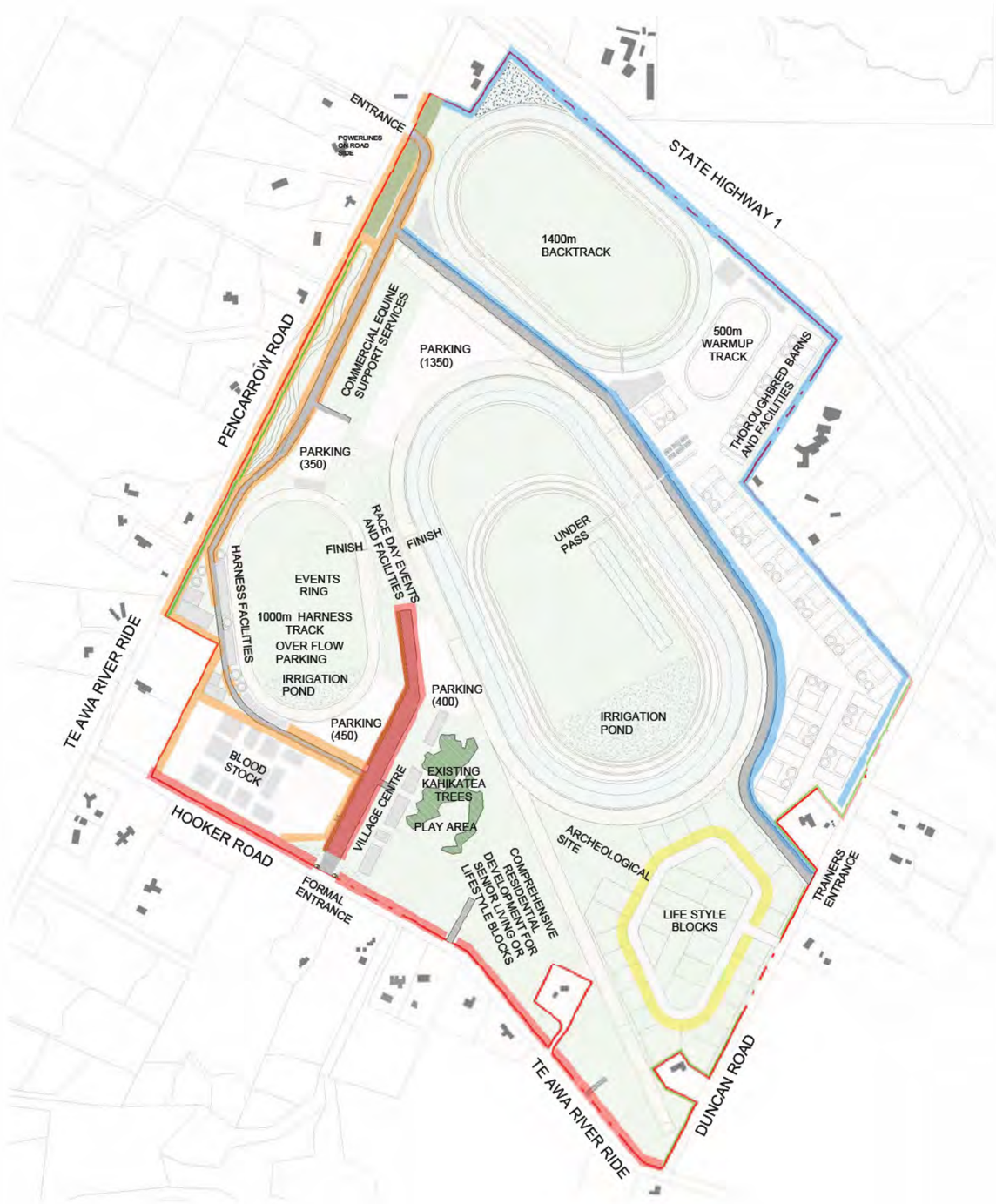


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LANDSCAPE

2

2.1 LANDSCAPE
SITE PLAN



N

Landscape Site Plan

SCALE @ A3 -1 : 10000

PROPOSED SPECIMEN TREES

- *Populus* 'Crows Nest' - upright poplar - 5m Spacings
- *Liriodendron tulipfera* - tulip tree - 10m Spacings
- *Platanus x acerifolia* - London plane tree - 10m Spacings
- *Prumnopitys taxifolia* - matai - 15m Spacings

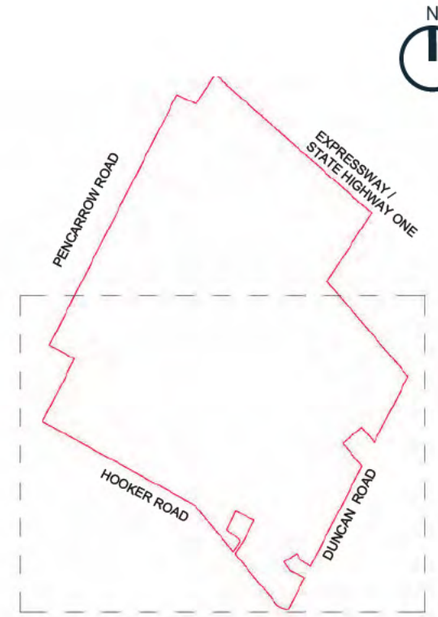
VEGETATION

- Hedge - Griselinia 'Ardmore Green'
- Existing Vegetation
- Proposed Native Shrub Planting

NOTE: Refer to Architectural Documentation for Racetrack and Facilities Locations.
Refer to Civil's Documentation for Swale Design.

2.2 LANDSCAPE - EXISTING TREES





LOCATION EXISTING TREE HEALTH

- Excellent
- Good
- Fair
- Poor

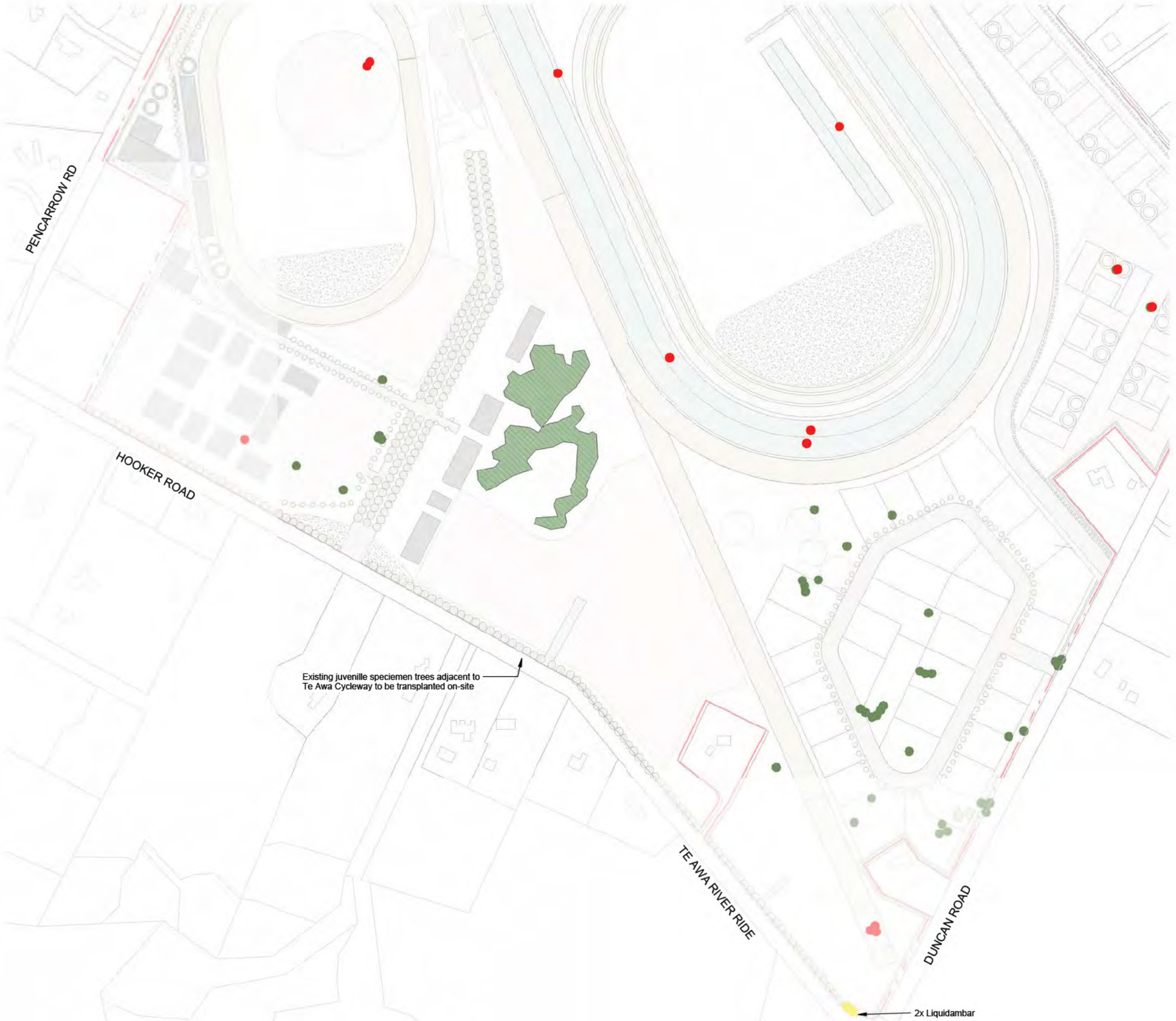
VEGETATION

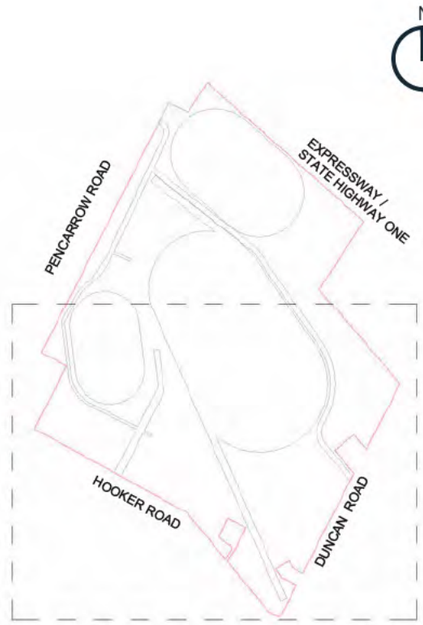
- Existing Kahikatea Grove

NOTE: Refer to Arboricultural Specialist's Report for Existing Tree Schedule and Species to be removed / retained

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2.3 LANDSCAPE - EXISTING TREES TO BE RETAINED





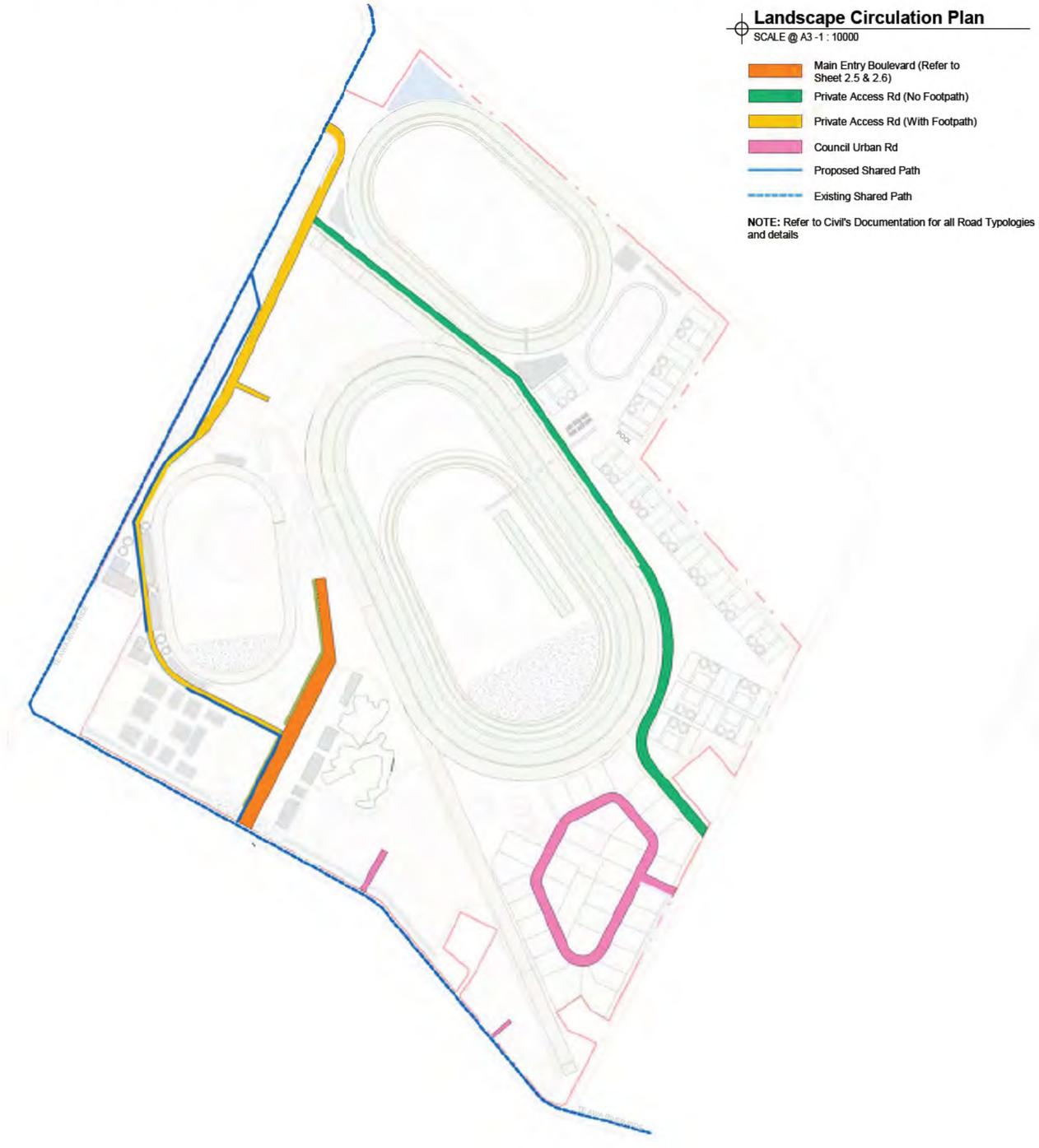
LOCATION OF EXISTING TREES

- Retain
- Remove
- To be transplanted
- Existing Kahikatea Grove to be retained

NOTE: Refer to Arboricultural Specialist's Report for Existing Tree Schedule and Species to be removed / retained

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2.4 LANDSCAPE
CIRCULATION AND SWALE CONCEPT PLANS



Landscape Circulation Plan
SCALE @ A3 -1 : 10000

- Main Entry Boulevard (Refer to Sheet 2.5 & 2.6)
- Private Access Rd (No Footpath)
- Private Access Rd (With Footpath)
- Council Urban Rd
- Proposed Shared Path
- Existing Shared Path

NOTE: Refer to Civil's Documentation for all Road Typologies and details

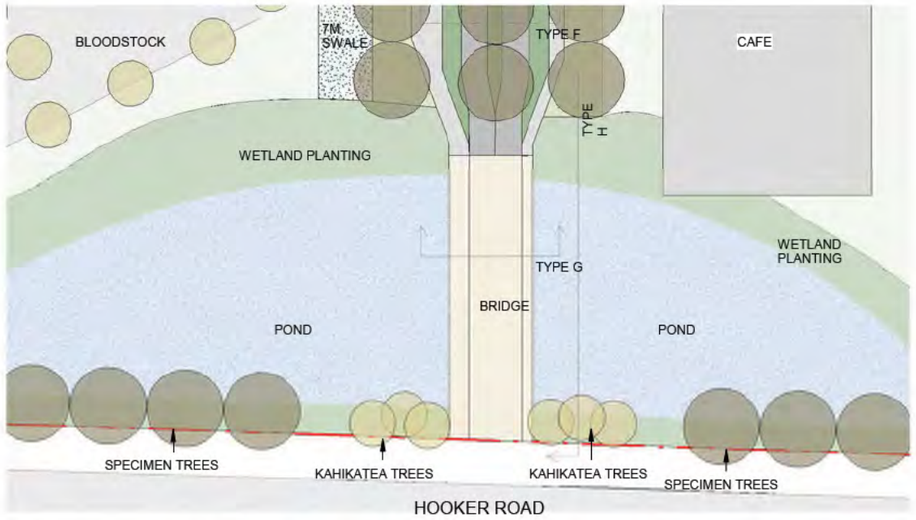


Landscape Site Swales Plan
SCALE @ A3 -1 : 10000

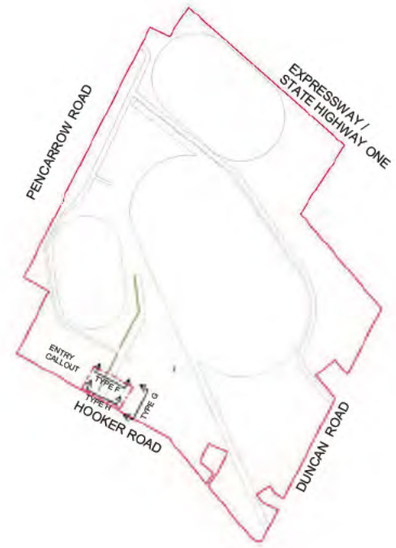
- Swale - 10m Wide
- Swale - 7m Wide
- Swale - 5m Wide
- Rain Garden - 2.5m Wide

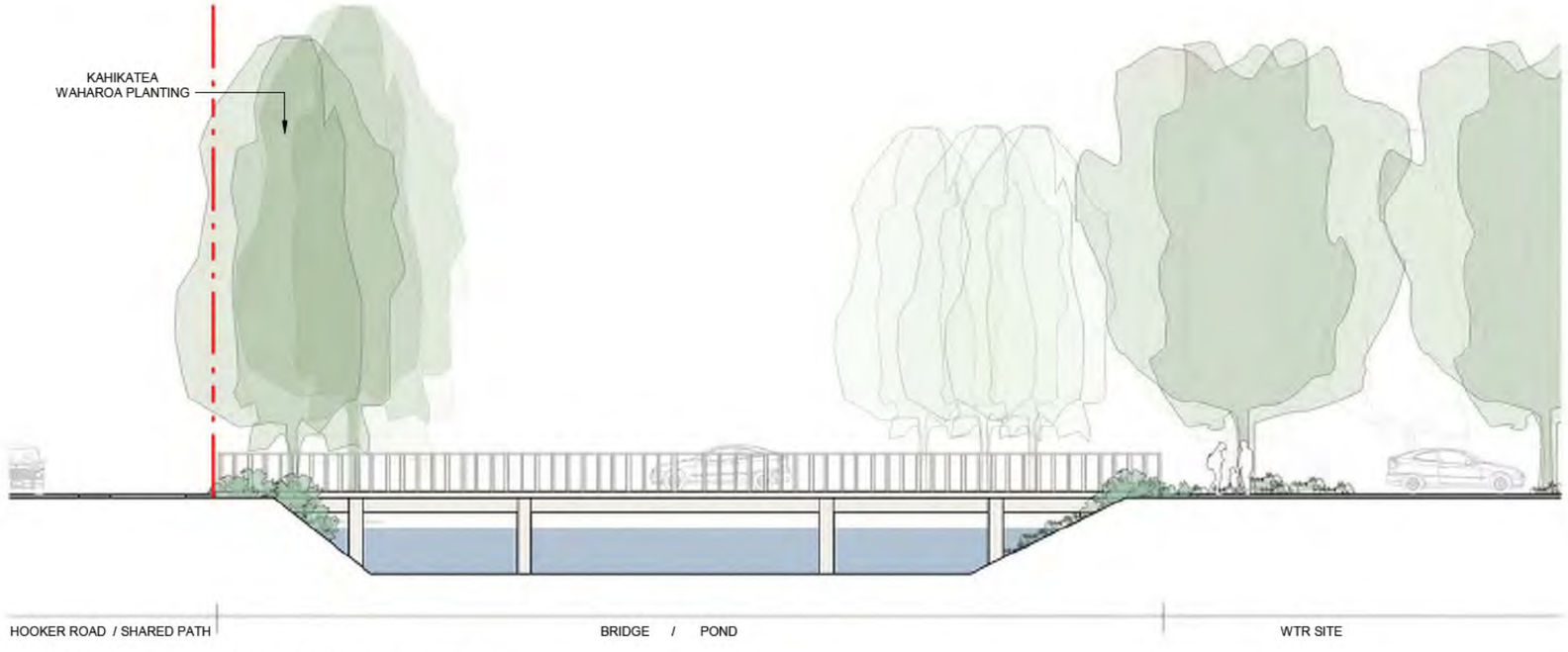
NOTE: Refer to Civil's Documentation for Swale Design.

2.5 LANDSCAPE
LANDSCAPE - EDGE CONDITIONS - HOOKER ROAD ENTRY

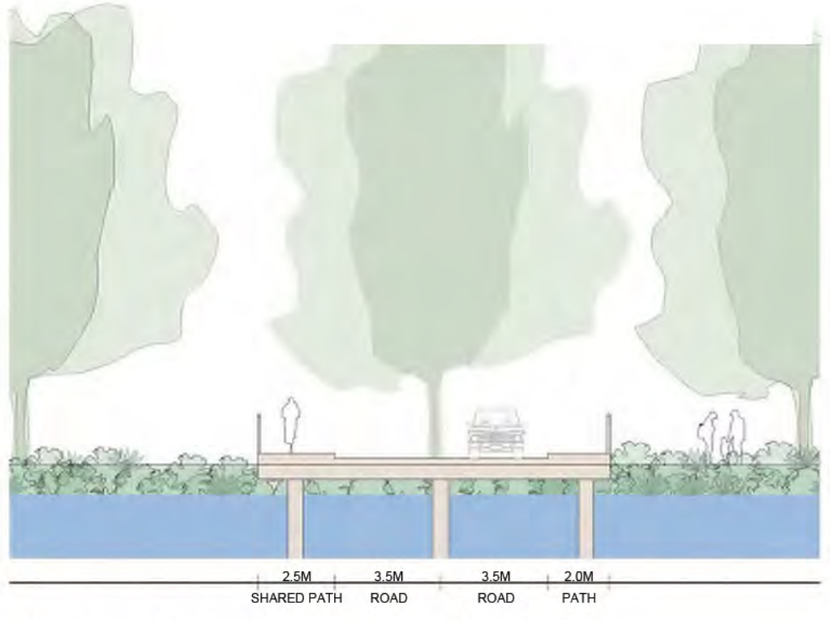


Landscape Callout - Hooker Rd Main Entry Boulevard
SCALE @ A3 -1 : 800





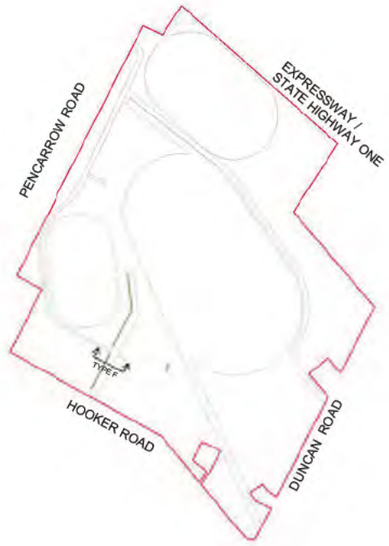
Landscape Section-TYPE H_ Hooker Rd Entry
SCALE @ A3 - 1 : 200

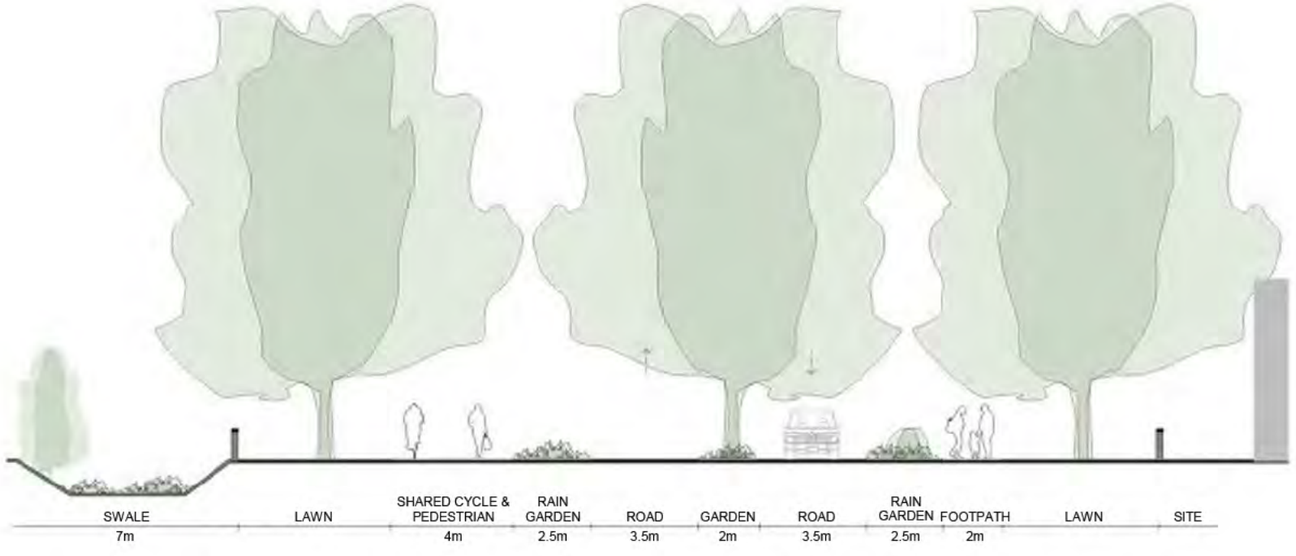


Landsape Section-TYPE G_ Hooker Rd Entry to Main Boulevard
SCALE @ A3 - 1 : 200

COX designgroup stapleton elliott

2.6 LANDSCAPE
LANDSCAPE SECTION - ENTRY BOULEVARD

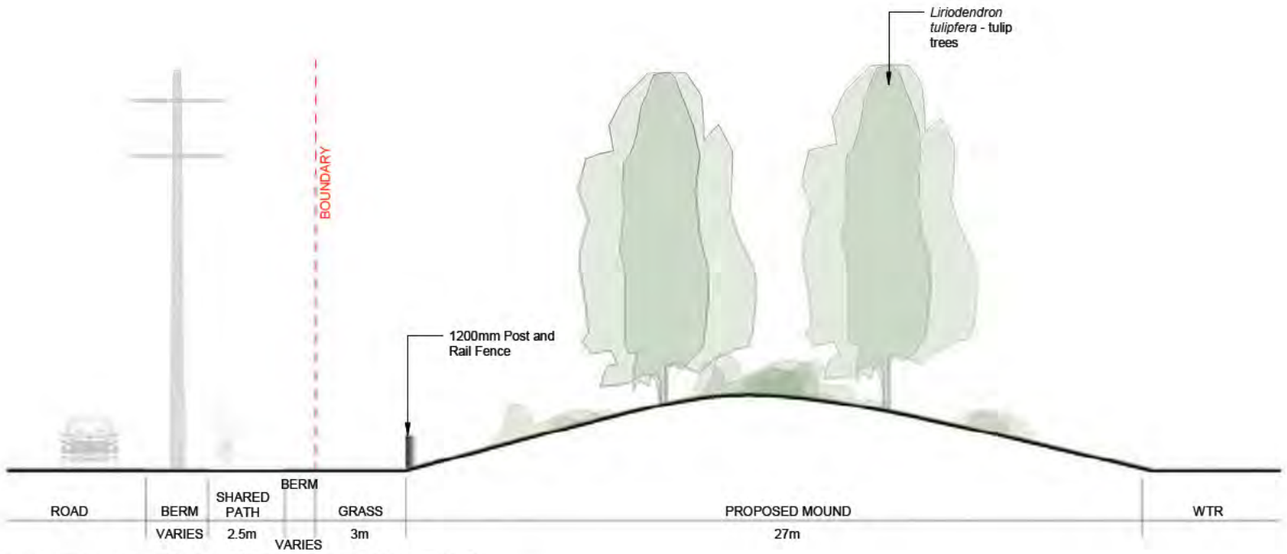




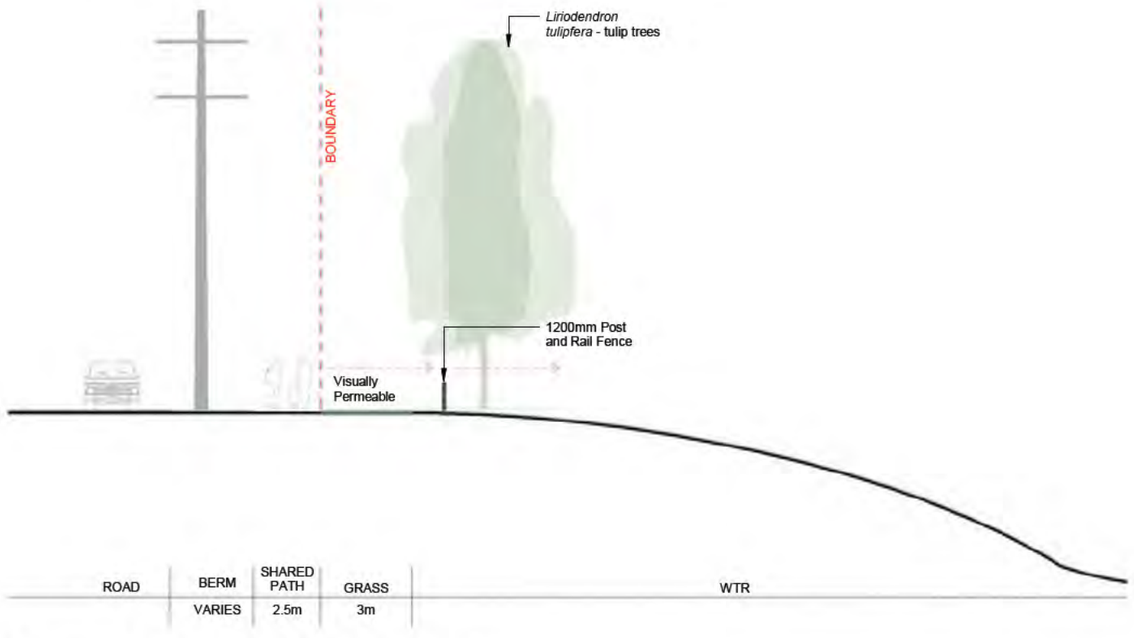
Landscape Section -TYPE F_Main Entry Boulevard
SCALE @ A3 - 1 : 200

designgroup stapleton elliott

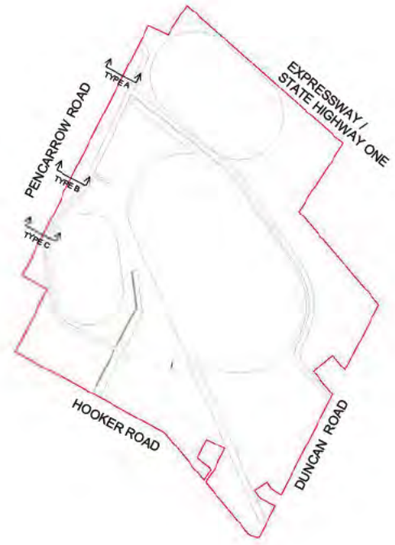
2.7 LANDSCAPE
LANDSCAPE - EDGE CONDITIONS - PENCARROW ROAD

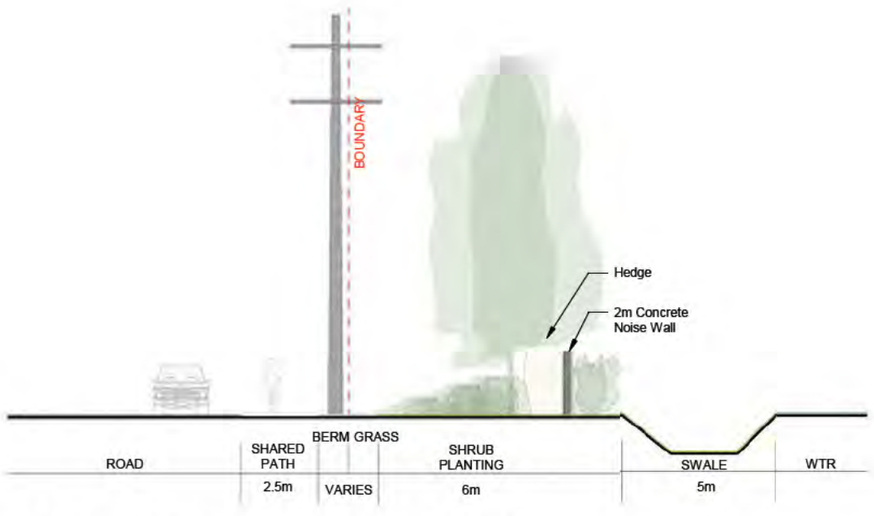


Landscape Section -TYPE A_Pencarrow Road
SCALE @ A3 - 1 : 200



Landscape Section -TYPE B_Pencarrow Road
SCALE @ A3 - 1 : 200

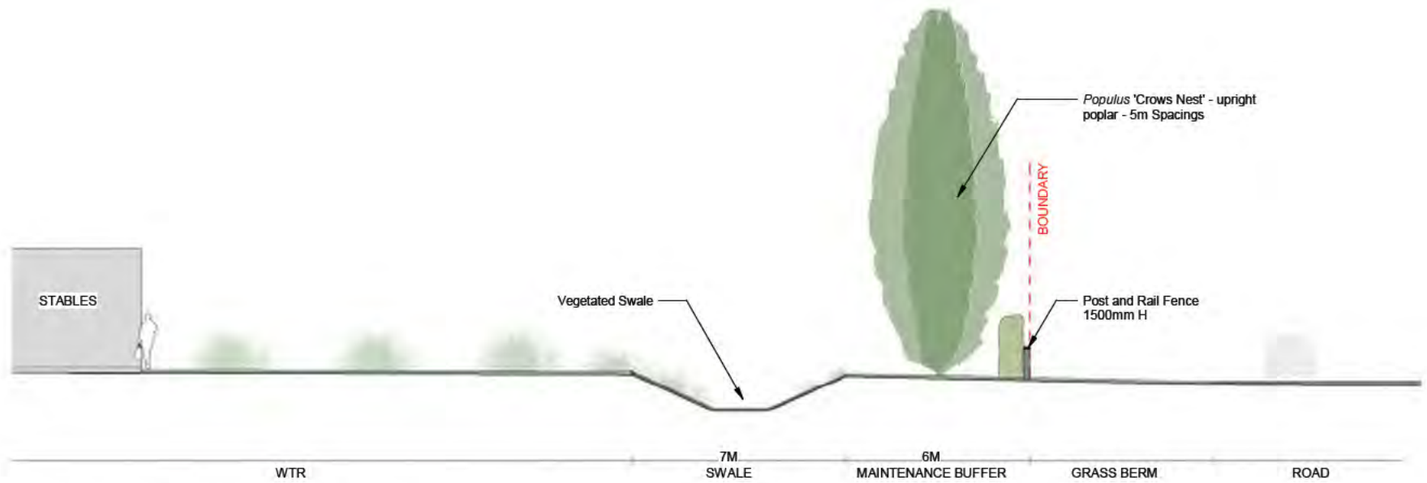




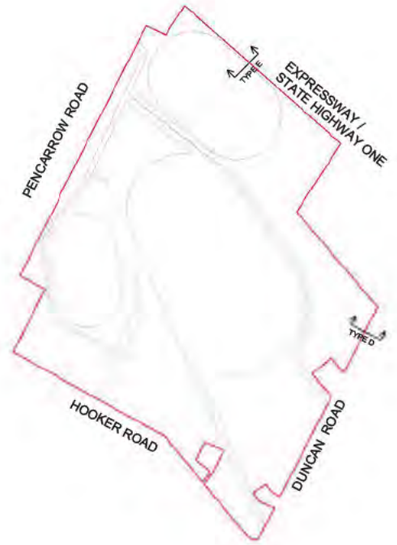
Landscape Section -TYPE C_Pencarrow Road
SCALE @ A3 - 1 : 200

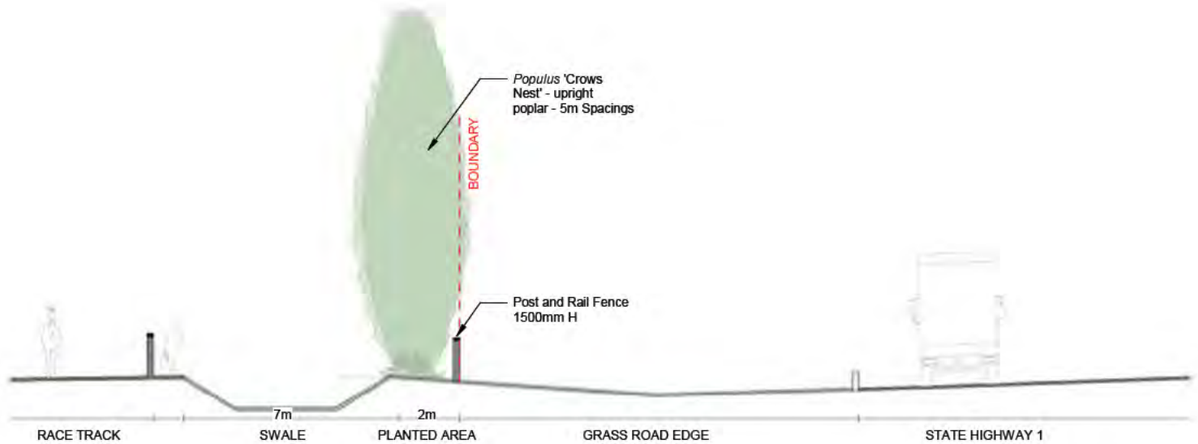
COX designgroup stapleton elliott

2.8 LANDSCAPE
LANDSCAPE - EDGE CONDITIONS - DUNCAN ROAD + EXPRESSWAY



Landscape Section - TYPE D_Duncan Road
SCALE @ A3 - 1 : 200





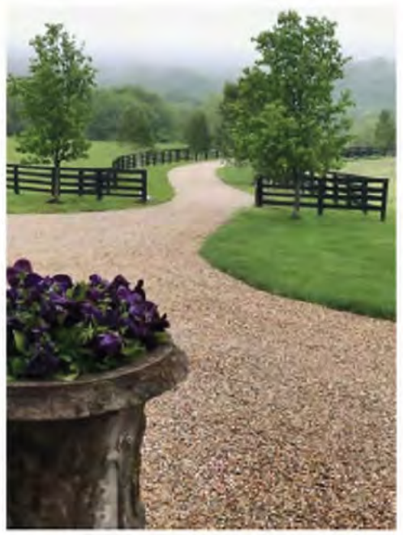
Landscape Section - TYPE E _Expressway
SCALE @ A3 - 1 : 200

COX designgroup stapleton elliott

2.9 LANDSCAPE
LOOK AND FEEL





















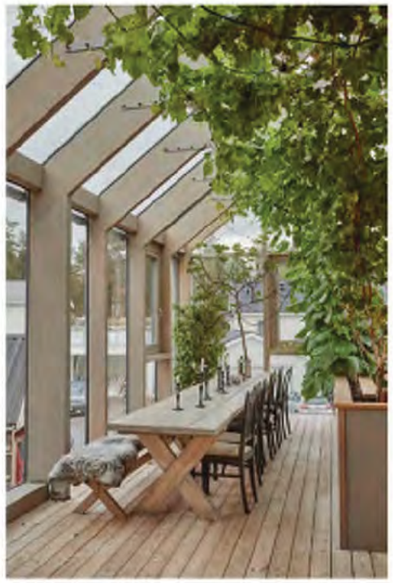


2.10 LANDSCAPE
LOOK AND FEEL













COX designgroup stapleton elliott

2.11 LANDSCAPE
INDICATIVE PLANT PALETTE

NOTE: Indicative plant selection to be reviewed by Mana Whenua for comment prior to final selections.
Proposed NZ native plants labelled in green.



Carpinus betulus fastigiata - upright hornbeam



Liriodendron tulipfera - tulip tree



Betula 'Jacquemontii' - white barked birch



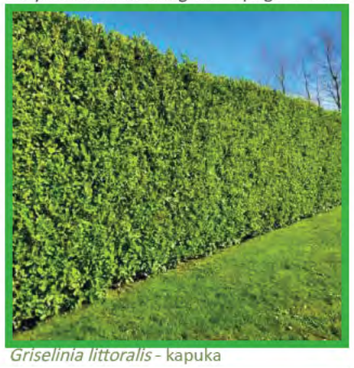
Psuedopanax 'Cyril Watson' - houpara



Ligustrum 'Rotundifolium' - Japanese privet



Geniostoma ligustrifolium - hangehange



Griselinia littoralis - kapuka



Populus nigra - Lombardy poplar



Vitex lucens - puriri



Michelia figo - port wine magnolia hedge



Citrus 'Tahitian Lime' - lime hedge



Laurus nobilis - bay hedge



Hydrangea spp. - hydrangea



Beilschmiedia tawa - tawa



Dacrycarpus dacrydiodes - kahikatea



Macropiper subs. psittacorum - kawakawa



Laurelia nz - pukatea



Dichondra repens - Mercury Bay weed



Pratia angulata - pānakenake

2.12 LANDSCAPE
INDICATIVE PLANT PALETTE

NOTE: Indicative plant selection to be reviewed by Mana Whenua for comment prior to final selections.
Proposed NZ native plants labelled in green.



Miscanthus spp. - maiden grass



Salvia spp. - sage



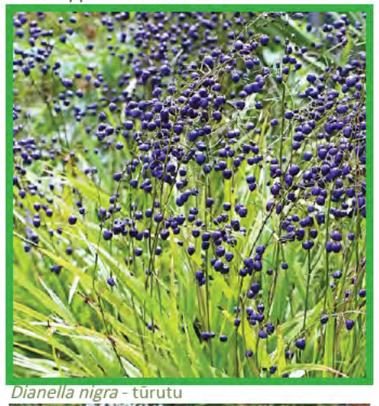
Hebe spp. - hebe



Libertia grandiflora - mikoioi



Guara spp. - bee blossom



Dianella nigra - tūrutu



Carex flag. green - mānia



Lavandula spp. - lavender



Achillea spp. - bloodwort



Achillea spp. - bloodwort



Carex comans bronze - maurea



Hemerocallis spp. - day lilies



Rosmarinus spp. - rosemary



Daphne spp - daphne



Acorus 'Mini Green' - Japanese sweet flag



Zephyranthes candida - rain lilies



Chionochloa spp. - dwarf toetoe

3

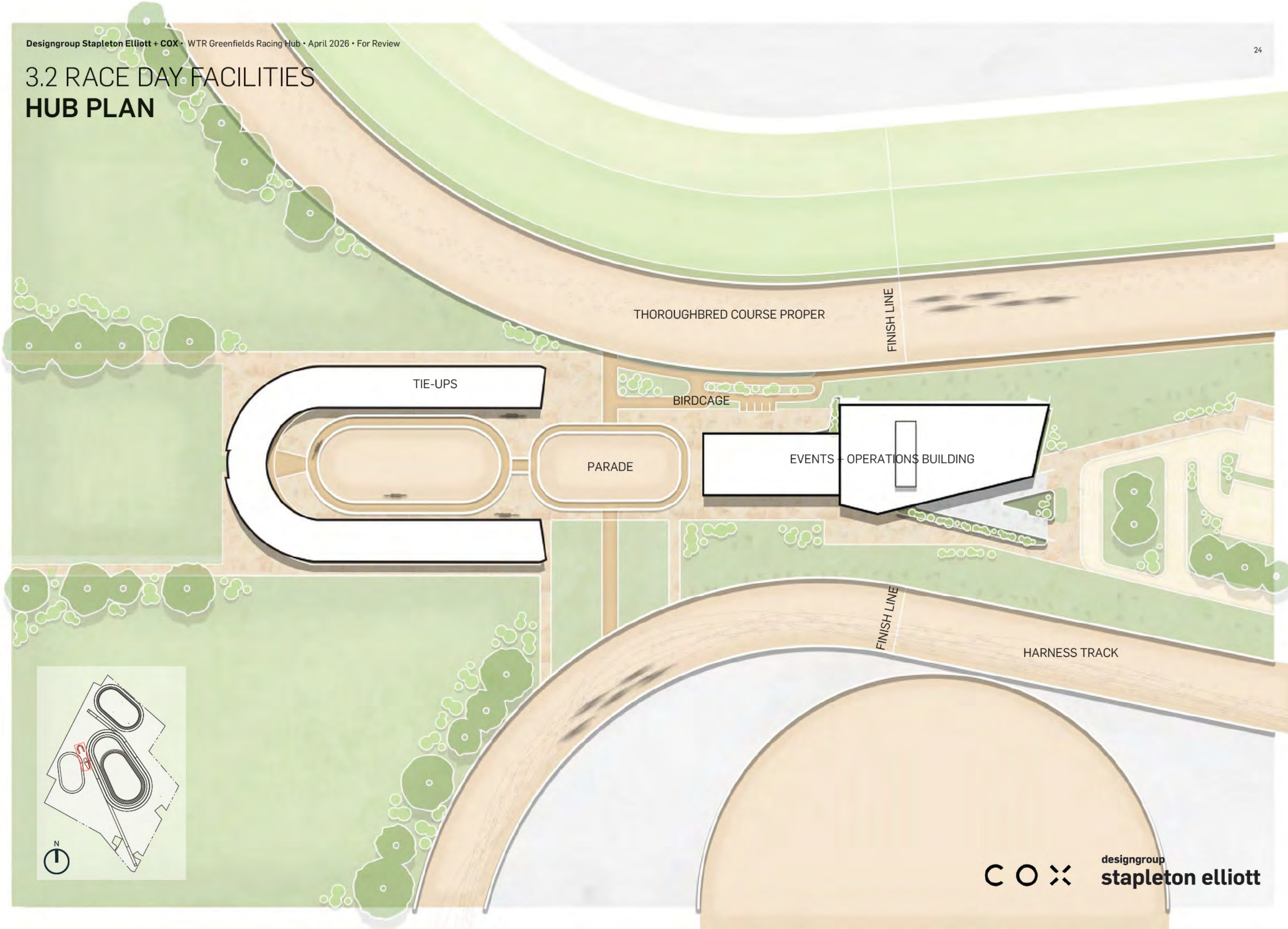
RACE DAY FACILITIES

3.1 RACE DAY FACILITIES
RENDER



designgroup
stapleton elliott

3.2 RACE DAY FACILITIES
HUB PLAN



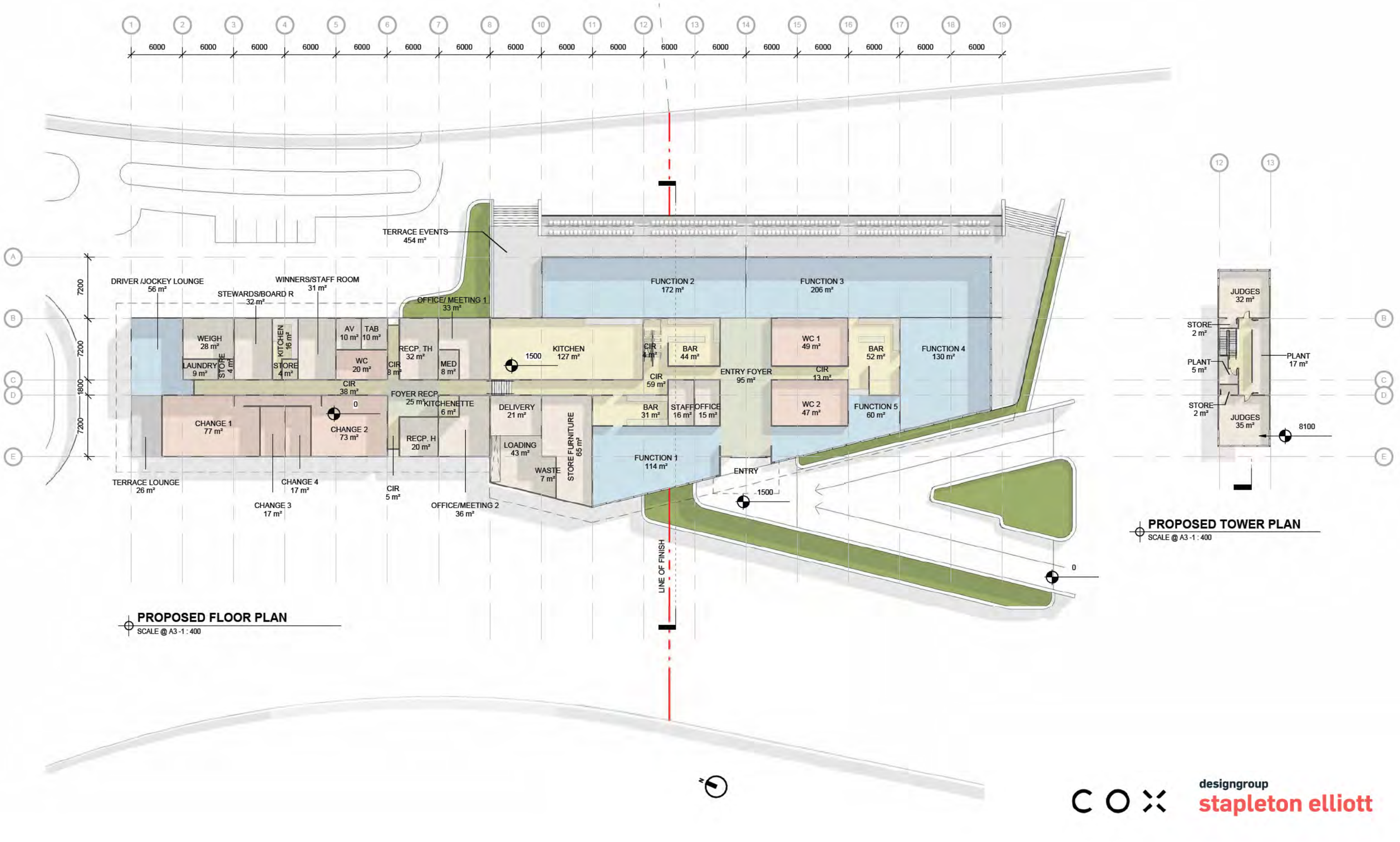
designgroup stapleton elliott

3.3 EVENT + OPERATIONS BUILDING
RENDER 1



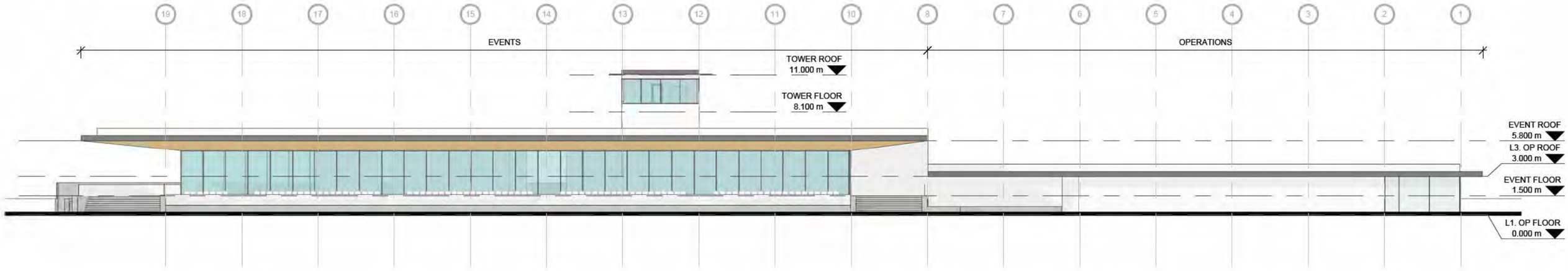
designgroup
stapleton elliott

3.4 EVENT + OPERATIONS BUILDING
PLAN

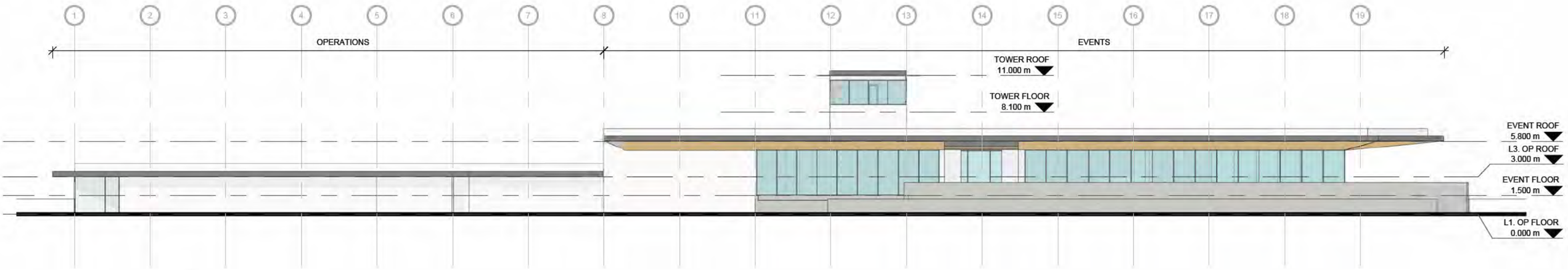


designgroup stapleton elliott

3.5 EVENT + OPERATIONS BUILDING
ELEVATIONS 1 + 2



North Elevation
SCALE @ A3 -1 : 300



South Elevation
SCALE @ A3 -1 : 300

COX designgroup stapleton elliott

3.6 EVENT + OPERATIONS BUILDING
SHORT SECTION



SHORT SECTION
SCALE @ A3 - 1 : 200

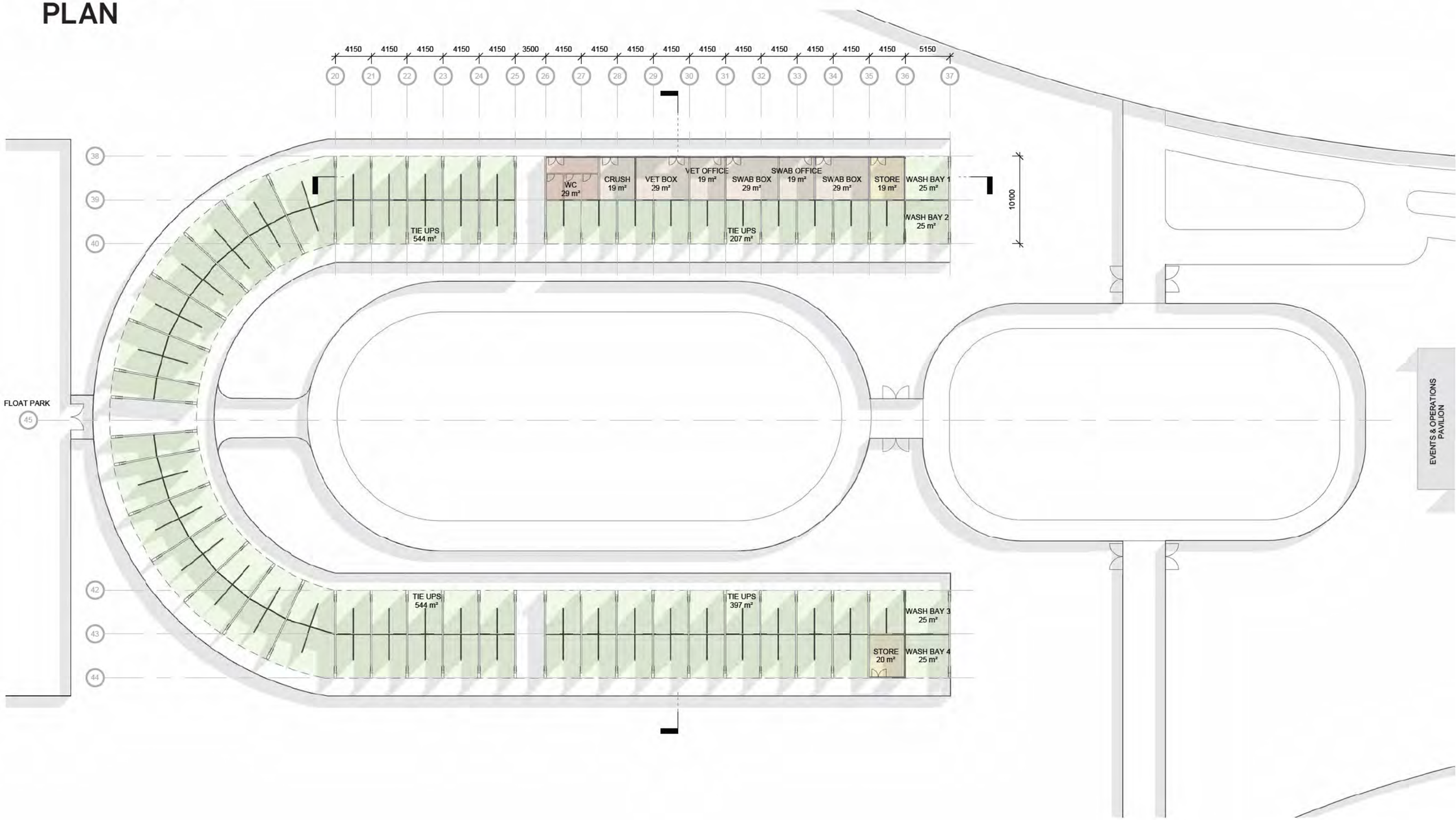
COX designgroup stapleton elliott

3.7 EVENT + OPERATIONS BUILDING
RENDER 2



designgroup
stapleton elliott

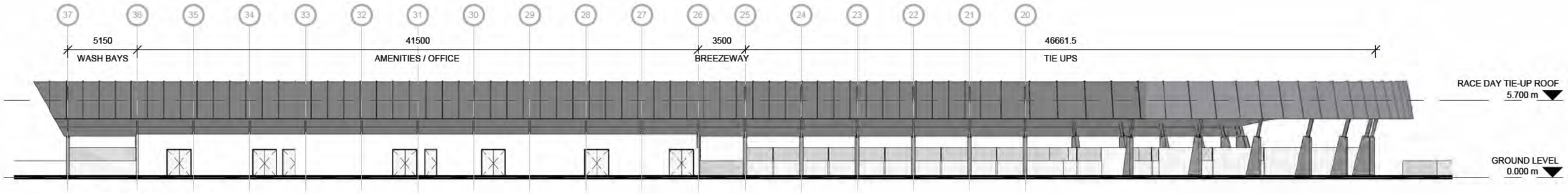
3.8 TIE-UPS
PLAN



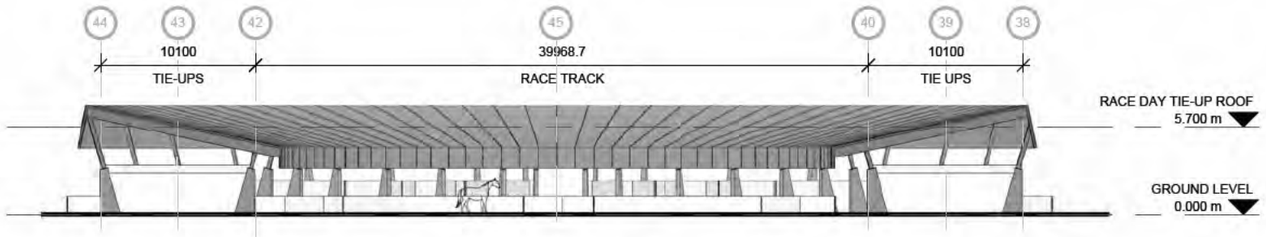
TOTAL TIE-UP BAYS: 150

designgroup
stapleton elliott

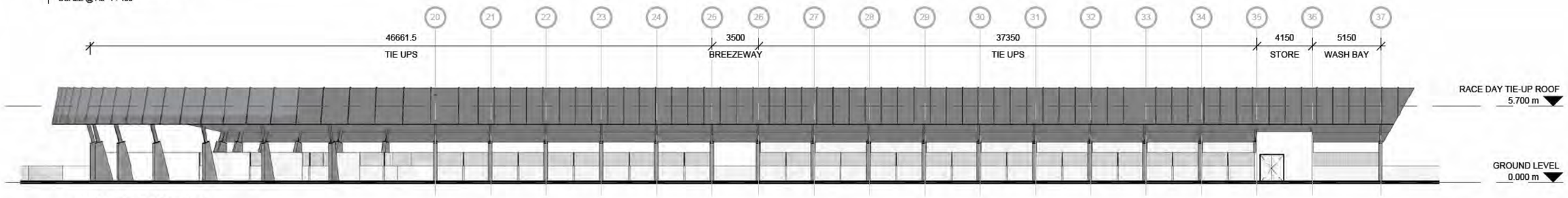
3.9 TIE-UPS
ELEVATIONS



NORTH ELEVATION
SCALE @ A3 -1 : 300



EAST ELEVATION
SCALE @ A3 -1 : 400



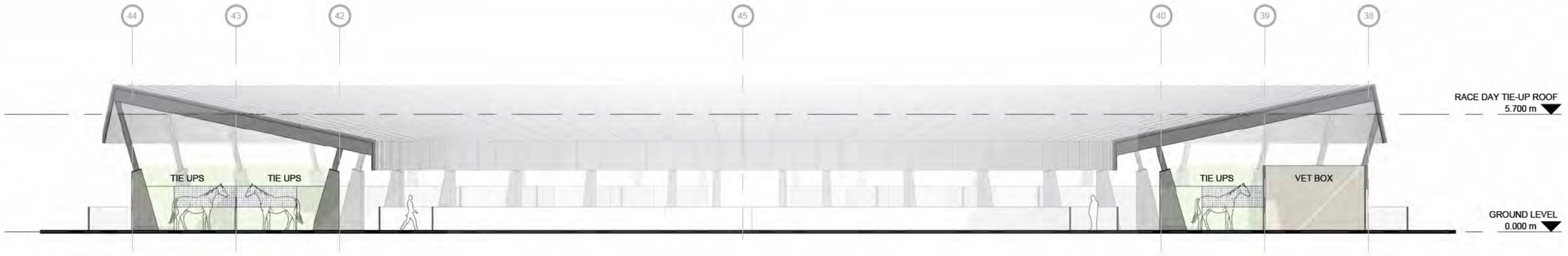
SOUTH ELEVATION
SCALE @ A3 -1 : 300



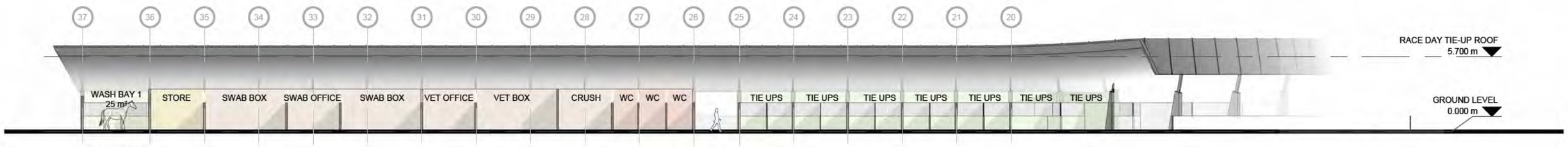
WEST ELEVATION
SCALE @ A3 -1 : 300

COX designgroup stapleton elliott

3.10 TIE-UPS
SECTIONS



SECTION 1
SCALE @ A3 - 1 : 200



SECTION 2
SCALE @ A3 -1 : 300

COX designgroup stapleton elliott

3.11 TIE-UPS
RENDER 1



designgroup
stapleton elliott

3.12 TIE-UPS
RENDER 2

designgroup
stapleton elliott

3.13 TIE-UPS
RENDER 3

designgroup
stapleton elliott

3.14 HOOKER ROAD ENTRY
RENDER

designgroup
stapleton elliott

3.15 FINISH LINE
RENDER

designgroup
stapleton elliott

HE MANA TŌ TE HOAHOANGA KA WHAKAATA I TE TANGATA ME TŌNA TŪRANGAWAEWAE // **THERE IS POWER IN DESIGNING ARCHITECTURE THAT REFLECTS ITS PEOPLE AND PLACE.**

COX designgroup stapleton elliott

Appendix C Site layout



Notes:
Elevation Contours are in terms of NZVD2016, generated using QGIS based on 2021 Lidar sourced from LINZ.
Aerial imagery, property boundaries, etc sourced from LINZ.

Client: WAIKATO THOROUGHBRED RACING TE AWA · CAMBRIDGE · WAIPA

Contractor

BCD GROUP

Sheet: Site Layout

Project Title: Waikato Thoroughbred Racing
Pencarrow, Hooker & Duncan Roads

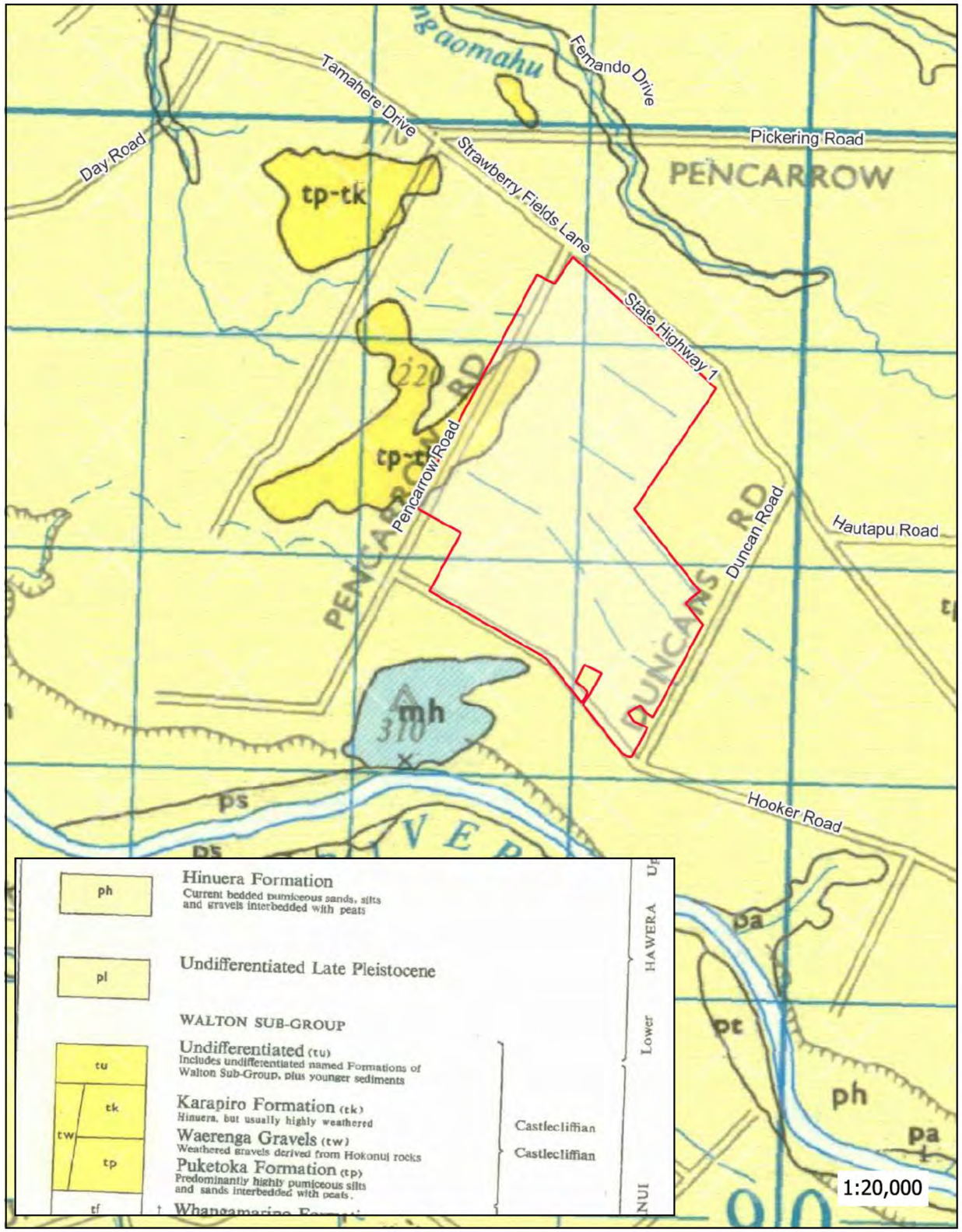
Revision	Date	By	Reason
01	27/02/2026	BB	Fast Track Referral Application

Drawn: SL
Engineer: SL
SCALE: 1000
At: A3
Job Number: 23-1883
Sheet Number:
Revision: 01

All dimensions to be verified on site before making any shop drawings or commencing any work

The copyright of this drawing remains with BCD Group

Appendix D Environmental maps



Client: WAIKATO THOROUGHBRED RACING TE AWA · CAMBRIDGE · WAIPA

Contractor

BCD GROUP

Sheet: Geological and Soil Type Map

Project Title: Waikato Thoroughbred Racing
Pencarrow, Hooker & Duncan Roads

Revision	Date	By	Reason
01	03/12/2025	SL	Master Planning

Drawn: SL
Engineer: SL
Scale: NA
At: A3
Job Number: 23-1883
Sheet Number:
Revision: 01

All dimensions to be verified on site before making any shop drawings or commencing any work

The copyright of this drawing remains with BCD Group

Appendix E Photolog

Photo #	Photograph
01 [redacted] farm: milking shed	

02 [redacted] farm: AST and storage shed



03 [redacted]
Farm: AST
Pad



04 [redacted]
Farm: Shed storage



05 [redacted]
Farm: Silage bunker



06 [redacted]
Farm:
Storage
Shed





07 [redacted]
Farm:
Stockpiled
soil



08 [redacted]
Farm:
Effluent
pond

09 [redacted]
Farm: Silage bunker



10 [redacted]
Farm:
Paddock 36
buildings



11 [redacted]
Farm:
Paddock 36
fill



12 [redacted]
Farm:
Paddock 36
fill



13 [redacted]
Farm:
Paddock 36
fill



14 [redacted]
Farm:
Paddock 36
fill



15

[redacted]

[redacted]: AST



16

[redacted]

[redacted] Farm:

Treated timber storage



17

[redacted]

Farm: Two AST



18

[redacted]

Farm: Agrichemical storage



19

[redacted] Farm:

Effluent pond



20

[redacted]

Farm:

Pump shed



21

[redacted]

[redacted]Farm: Burn pile



Appendix F Council information

From: Joshua Evans <[redacted]>
Sent: Thursday, 30 October 2025 2:19 pm
To: David Jackson
Subject: RE Land Use Information Register enquiry Multiple Properties', Tamahere (REQ225178) No SLUS

Dear David,

Thank you for your enquiry regarding information the Waikato Regional Council may hold relating to potential contamination at the property indicated below:

636 Pencarrow Road, Tamahere: LOT 1 DP 471383 LOT 2 DP 471383 SEC 49 SO 457609 (VGN: 0444343504), **38 Duncan Road, Tamahere:** SEC 2 SO 547526 (VGN: 0444335407), **18 Duncan Road, Tamahere:** LOT 1 DPS 67231 (VGN: 0444335400) & **48E Hooker Road, Tamahere:** LOT 5 DP 331688 (VGN: 0444334715)



Background: The Waikato Regional Council maintains a register of properties known to be contaminated on the basis of chemical measurements, or potentially contaminated on the basis of past land use. This register (called the Land Use Information Register) is still under development and should not be regarded as comprehensive. The 'potentially contaminated' category is gradually being compiled with reference to past or present land uses that have a greater than average chance of causing contamination, as outlined in the Ministry for the Environment's Hazardous Activities and Industries List (HAIL): Hazardous Activities and Industries List guidance: Identifying HAIL land | Ministry for the Environment

This property:

- I can confirm that this property **does not** currently appear on the Land Use Information Register. However, one site within your area of interest does currently appear on the Land Use Information Register.



The area shaded yellow above (LUI04071) appears on the Land Use Information Register with a classification of 'Verified HAIL – Limited Sampling' due to current land use for HAIL activity 'A10. Persistent pesticide bulk storage or land use (unknown – present)' associated with Strawberry Fields.

Very limited sampling included as part of Cambridge Expressway works. Reporting not sufficient to determine whether the land is or is not contaminated. See DM refs #3775113, #3775118 & #3775121 - REQ225178 - Sampling reports

District Councils: Our records are not integrated with those of territorial authorities, so it would also be worth contacting the Waikato District Council to complete your audit of Council records if you have not already done so. In general, information about known contaminated land will be included on a property LIM produced by the territorial authority.

Rural Land Considerations: Examples of sites that are "more likely than not" to have soil contamination (HAIL sites) include timber treatment activities, service stations and/or petroleum storage, panel beaters, spray painters, etc. Whilst pastoral farming is not included on this list, typical farming activities of horticulture, sheep dipping, chemical storage, petroleum storage and workshops are; but are more difficult to identify and may not be as well represented on the Land Use Information Register. Therefore, individuals interested in pastoral land may be interested in completing further investigations in accordance with Ministry for the Environment Guidelines prior to land purchase and/or development.

Additional Information: Please note that:

- Significant use of lead-based paint on buildings can, in some cases, pose a contamination risk; the use of lead-based paint is not recorded on the Land Use Information Register.
- Buildings in deteriorated or derelict condition which contain asbestos can result in asbestos fibres in soil; the use of asbestos in building materials is not recorded on the Land Use Information Register.
- The long term, frequent use of superphosphate fertilisers can potentially result in elevated levels of cadmium in soil; the use of superphosphate fertiliser is not recorded on the Land Use Information Register.
- We are not currently resourced to fully incorporate historic aerial photographs in our region-wide assessment of HAIL activities. A significant proportion of the Crown historical aerial image archive for the Waikato region is available to view free of charge at http://retrolens.nz/. We recommend this resource is consulted for any HAIL assessment.
- Due to the large volume of enquiries being received, we may not be able to respond to your enquiry as quickly as previously. We are resourced to meet **20 day** response times as per LGOIMA, but endeavour to respond more quickly when workload permits. If your enquiry is urgent, please note this first in your enquiry and we will do our best to assist.

Please feel free to contact me if you have any further queries on this matter. For any new enquiries or requests for information please continue to use the Request for Service form for 'Contaminated Land/HAIL.'

Regards,

Joshua Evans | SCIENTIST - CONTAMINATED LAND | Geothermal & Air, Land Ecology & Contamination, Science, Policy
WAIKATO REGIONAL COUNCIL | Te Kaunihera ā Rohe o Waikato
P: +[redacted]
M: [redacted]
F: facebook.com/waikatoregion
Private Bag 3038, Waikato Mail Centre, Hamilton, 3240

****
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****

Your Ref	In reply please quote	If calling, please ask for
	HAIL0030/26	Gloria Graham

Postal Address
Private Bag 544, Ngaruawahia
3742
New Zealand

0800 492 452
www.waikatodistrict.govt.nz

28 November 2025

D Jackson
220 Tristram Street
Hamilton 3204

Dear Sir/Madam

Property Enquiry - HAIL report

Further to your request for details of whether or not council records indicate that an activity or industry described in the Ministry for the Environment Hazardous Activities and Industries List (HAIL) is being, has been or is more likely than not to have been undertaken on a piece of land I can advise the following:

Property address: 636 Pencarrow Road & 38 Duncan Road TAMAHERE
VNZ Property ID: 04443/435.04 & 04443/354.07
Legal description: LOT 1-2 DP 471383 SEC 49 SO 457609 & SEC 2 SO 547526

No record of a HAIL activity has been found on Council records. **NOTE:** please see comments below for clarification required in respect of some matters found on the records if development on the property is proposed.

Comments:

Waikato District Council's Internal Land Resource Map identifies the western portion of the site as being subject to a subsidence hazard and an activity listed on the Hazardous Activities and Industries List (HAIL). No details are held on what the HAIL activity is, however. The site was not listed on the Waikato Regional Council's Selected Land Use Register (SLUR) for having hazardous activities having taken place on the site. It is possible that the site has been added to the Land Resource Map by mistake.

The site appears to have been used for pastoral farming activities including dairy farming. Prolonged application of superphosphate fertiliser has the potential to elevate cadmium in soil above the default rural-residential soil contaminant standard of 0.8 mg/kg. The soil contaminant standard (SCS) for cadmium is dependent on pH with the default SCS based on pH 5. The SCS increases significantly at higher soil pH. Landcare Research information indicates that the soil pH in the location is likely to be within a range between 5.8 - 6.4. At this pH the SCS for cadmium is above 1.5 mg/kg which is not considered likely to be exceeded due to application of superphosphate fertiliser.

A variety of historical structures have been built and demolished across the site that could have contained asbestos containing material (ACM) and/or lead based paint given the era of construction. Whilst such activities are not specifically identified on the HAIL, the use of lead-based paint and presence of ACM can result in the presence of such contaminants at elevated concentrations in the surrounding soil.
The following records (where applicable) were reviewed in this assessment:

Property file including any parent property file from which the property was developed
Waikato District Council Land Use Register
Waikato Regional Council Selected Land Use Register
Subdivision Consent files
Land Use Consent files
Building Consent files
Aerial Photography:

- 09/09/1957
- 12/05/1967
- 25/10/1979
- 16/02/1995
- 2008
- 2017
- 2025

Disclaimer:

This information is based on records held by the Council and/or Waikato Regional Council and reflects the council's current understanding of the site. The council does not accept any liability for any inaccuracy of this information or liability for any loss or damage suffered by any person acting or refraining from acting on this information.

If this information indicates that no record of a HAIL activity has been identified on Council records, this does not imply that no HAIL activity has been undertaken on the site. This simply means that the Council holds no record of a HAIL activity being undertaken on the property at this point in time. However, Council records may be incomplete. Similarly, if one HAIL activity is identified, this does not preclude another HAIL activity having been undertaken of which no record is held. If an activity is proposed to be undertaken on the site that is covered by the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES), Council retains the right to seek further information on the site history of the subject property. Where pastoral farming activities have been identified, Council may seek information in respect of cadmium in soil resulting from application of superphosphate fertiliser if residential activities are proposed.

If you have any queries please, do not hesitate to contact us.

Yours faithfully,



Ollie Patu
Environmental Health Specialist

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09-09-1957

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12-05-1967

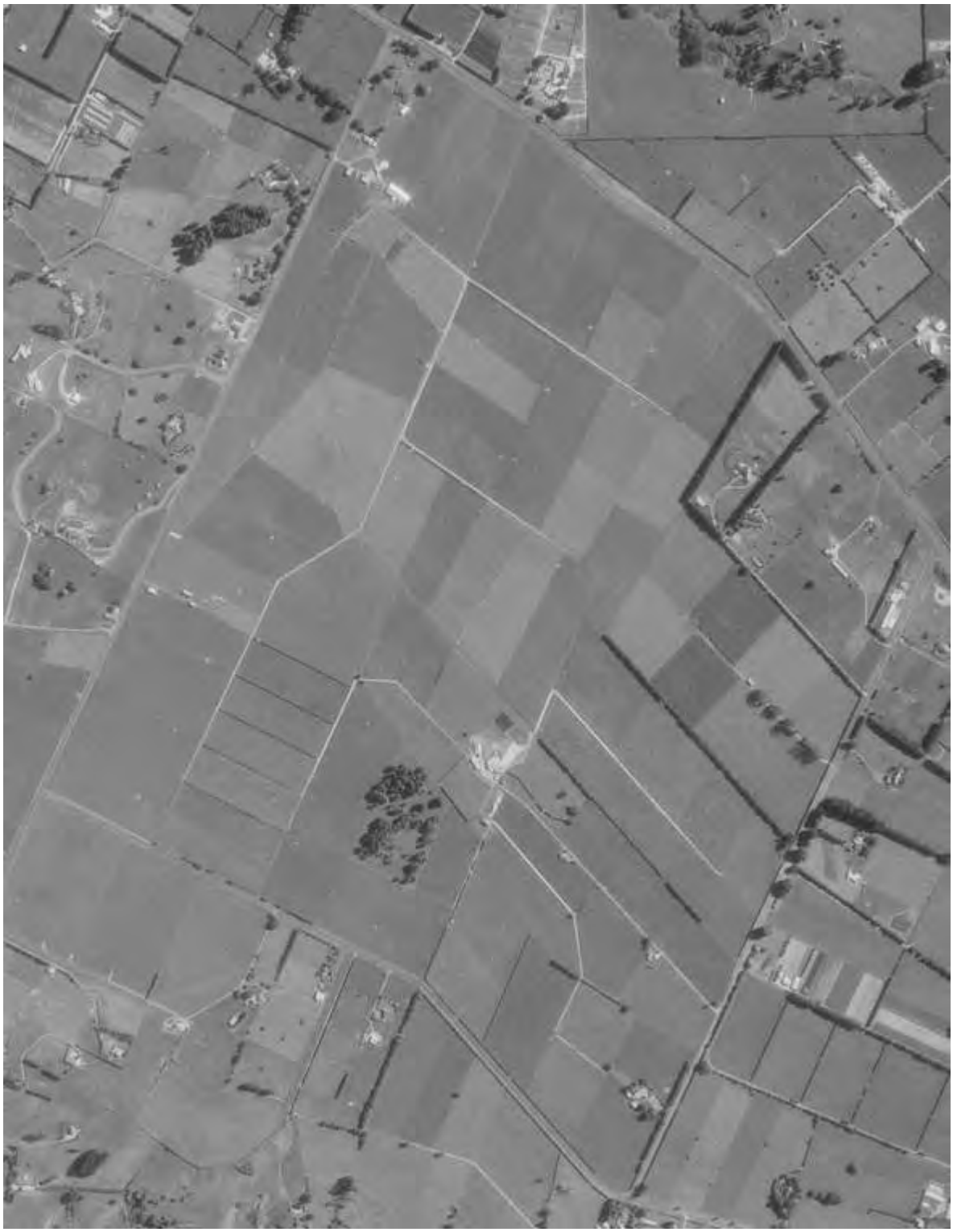
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Document Set ID: 6570372
Version: 6, Version Date: 02/12/2025



25-10-1979

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16-02-1995

Sourced from Waikato District Council Intramaps GIS



2008

Sourced from Waikato District Council Intramaps GIS



2017

Sourced from Waikato District Council Intramaps GIS


DAY RD
TE AWA CYCLEWAY
TIAMAHERE - HOOKER)
DUNCAN RD
HAUTAPU RD
DISCOMBE RD
PENCARROW RD
HOOKER RD
SH 1
2025

Your Ref	In reply please quote	If calling, please ask for
	HAIL0032/26	Gloria Graham

Postal Address
Private Bag 544, Ngaruawahia
3742
New Zealand

0800 492 452
www.waikatodistrict.govt.nz

02 December 2025

D Jackson
220 Tristram Street
Hamilton 3204

Dear Sir/Madam

Property Enquiry - HAIL report

Further to your request for details of whether or not council records indicate that an activity or industry described in the Ministry for the Environment Hazardous Activities and Industries List (HAIL) is being, has been or is more likely than not to have been undertaken on a piece of land I can advise the following:

Property address: **48 E Hooker Road TAMAHERE**
VNZ Property ID: **04443/347.15**
Legal description: **LOT 5 DP 331688 BLK VII HAMILTON SD SUBJ TO VARIOUS ESMTS**

No record of a HAIL activity has been found on Council records. **NOTE:** please see comments below for clarification required in respect of some matters found on the records if development on the property is proposed.

Comments:

The site appears to have been used for pastoral farming activities including dairy farming. Prolonged application of superphosphate fertiliser has the potential to elevate cadmium in soil above the default rural-residential soil contaminant standard of 0.8 mg/kg. The soil contaminant standard (SCS) for cadmium is dependent on pH with the default SCS based on pH 5. The SCS increases significantly at higher soil pH. Landcare Research information indicates that the soil pH in the location is likely to be within a range between 5.8 - 6.4. At this pH the SCS for cadmium is above 1.5 mg/kg which is not considered likely to be exceeded due to application of superphosphate fertiliser.

The following records (where applicable) were reviewed in this assessment:

Property file including any parent property file from which the property was developed
Waikato District Council Land Use Register
Waikato Regional Council Selected Land Use Register
Subdivision Consent files
Land Use Consent files
Building Consent files
Aerial Photography:

- 09-09-1957

- 12-05-1967
- 25-10-1979
- 16-02-1995
- 2008
- 2017
- 2025

Disclaimer:

This information is based on records held by the Council and/or Waikato Regional Council and reflects the council's current understanding of the site. The council does not accept any liability for any inaccuracy of this information or liability for any loss or damage suffered by any person acting or refraining from acting on this information.

If this information indicates that no record of a HAIL activity has been identified on Council records, this does not imply that no HAIL activity has been undertaken on the site. This simply means that the Council holds no record of a HAIL activity being undertaken on the property at this point in time. However, Council records may be incomplete. Similarly, if one HAIL activity is identified, this does not preclude another HAIL activity having been undertaken of which no record is held. If an activity is proposed to be undertaken on the site that is covered by the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES), Council retains the right to seek further information on the site history of the subject property. Where pastoral farming activities have been identified, Council may seek information in respect of cadmium in soil resulting from application of superphosphate fertiliser if residential activities are proposed.

If you have any queries, please do not hesitate to contact us.

Yours faithfully,



Ollie Patu
Environmental Health Specialist

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09-09-1957

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12-05-1967

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25-10-1979

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16-02-1995

Sourced from Waikato District Council Intramaps GIS



2008

Sourced from Waikato District Council Intramaps GIS



2017

Sourced from Waikato District Council Intramaps GIS



2025

Document Set ID: 6574371
Version: 3, Version Date: 02/12/2025

Your Ref	In reply please quote	If calling, please ask for
	HAIL0031/26	Gloria Graham

Postal Address
Private Bag 544, Ngaruawahia
3742
New Zealand

0800 492 452
www.waikatodistrict.govt.nz

02 December 2025

D Jackson
220 Tristram Street
Hamilton 3204

Dear Sir/Madam

Property Enquiry - HAIL report

Further to your request for details of whether or not council records indicate that an activity or industry described in the Ministry for the Environment Hazardous Activities and Industries List (HAIL) is being, has been or is more likely than not to have been undertaken on a piece of land I can advise the following:

Property address: 18 Duncan Road TAMAHERE
VNZ Property ID: 04443/354.00
Legal description: LOT 1 DPS 67231 BLK VIII HAMILTON SD

No record of a HAIL activity has been found on Council records. **NOTE:** please see comments below for clarification required in respect of some matters found on the records if development on the property is proposed.

Comments:

The site appears to have been used for pastoral farming activities including dairy farming. Prolonged application of superphosphate fertiliser has the potential to elevate cadmium in soil above the default rural-residential soil contaminant standard of 0.8 mg/kg. The soil contaminant standard (SCS) for cadmium is dependent on pH with the default SCS based on pH 5. The SCS increases significantly at higher soil pH. Landcare Research information indicates that the soil pH in the location is likely to be within a range between 5.8 - 6.4. At this pH the SCS for cadmium is above 1.5 mg/kg which is not considered likely to be exceeded due to application of superphosphate fertiliser.

The following records (where applicable) were reviewed in this assessment:

Property file including any parent property file from which the property was developed
Waikato District Council Land Use Register
Waikato Regional Council Selected Land Use Register
Subdivision Consent files
Land Use Consent files
Building Consent files
Aerial Photography:

- 09-09-1957
- 12-05-1967

- 25-10-1979
- 16-02-1995
- 2008
- 2017
- 2025

Disclaimer:

This information is based on records held by the Council and/or Waikato Regional Council and reflects the council's current understanding of the site. The council does not accept any liability for any inaccuracy of this information or liability for any loss or damage suffered by any person acting or refraining from acting on this information.

If this information indicates that no record of a HAIL activity has been identified on Council records, this does not imply that no HAIL activity has been undertaken on the site. This simply means that the Council holds no record of a HAIL activity being undertaken on the property at this point in time. However, Council records may be incomplete. Similarly, if one HAIL activity is identified, this does not preclude another HAIL activity having been undertaken of which no record is held. If an activity is proposed to be undertaken on the site that is covered by the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES), Council retains the right to seek further information on the site history of the subject property. Where pastoral farming activities have been identified, Council may seek information in respect of cadmium in soil resulting from application of superphosphate fertiliser if residential activities are proposed.

If you have any queries, do not hesitate to contact us.

Yours faithfully,



Ollie Patu
Environmental Health Specialist

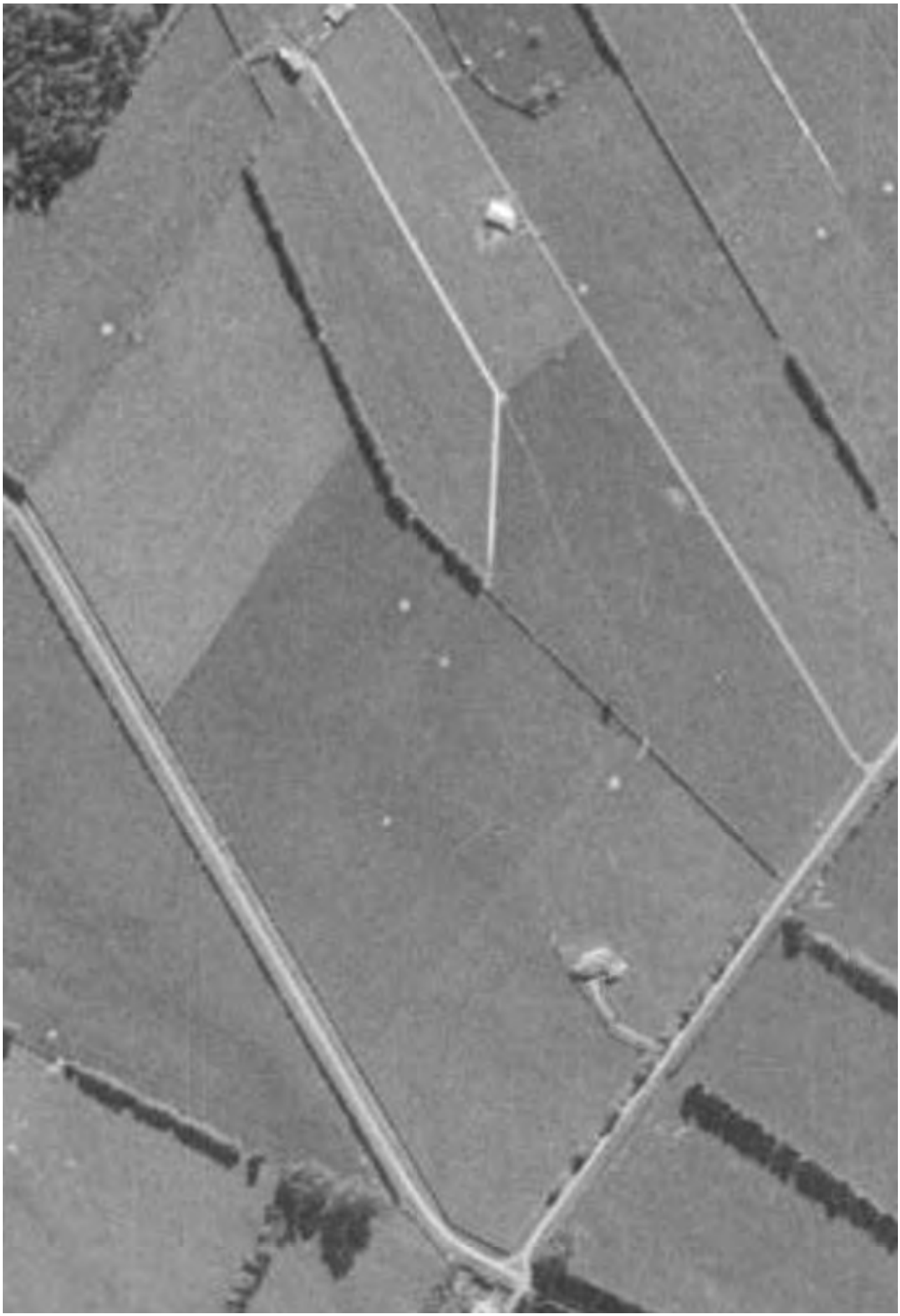
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09-09-1957

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Document Set ID: 6574206
Version: 3, Version Date: 02/12/2025



12-05-1967

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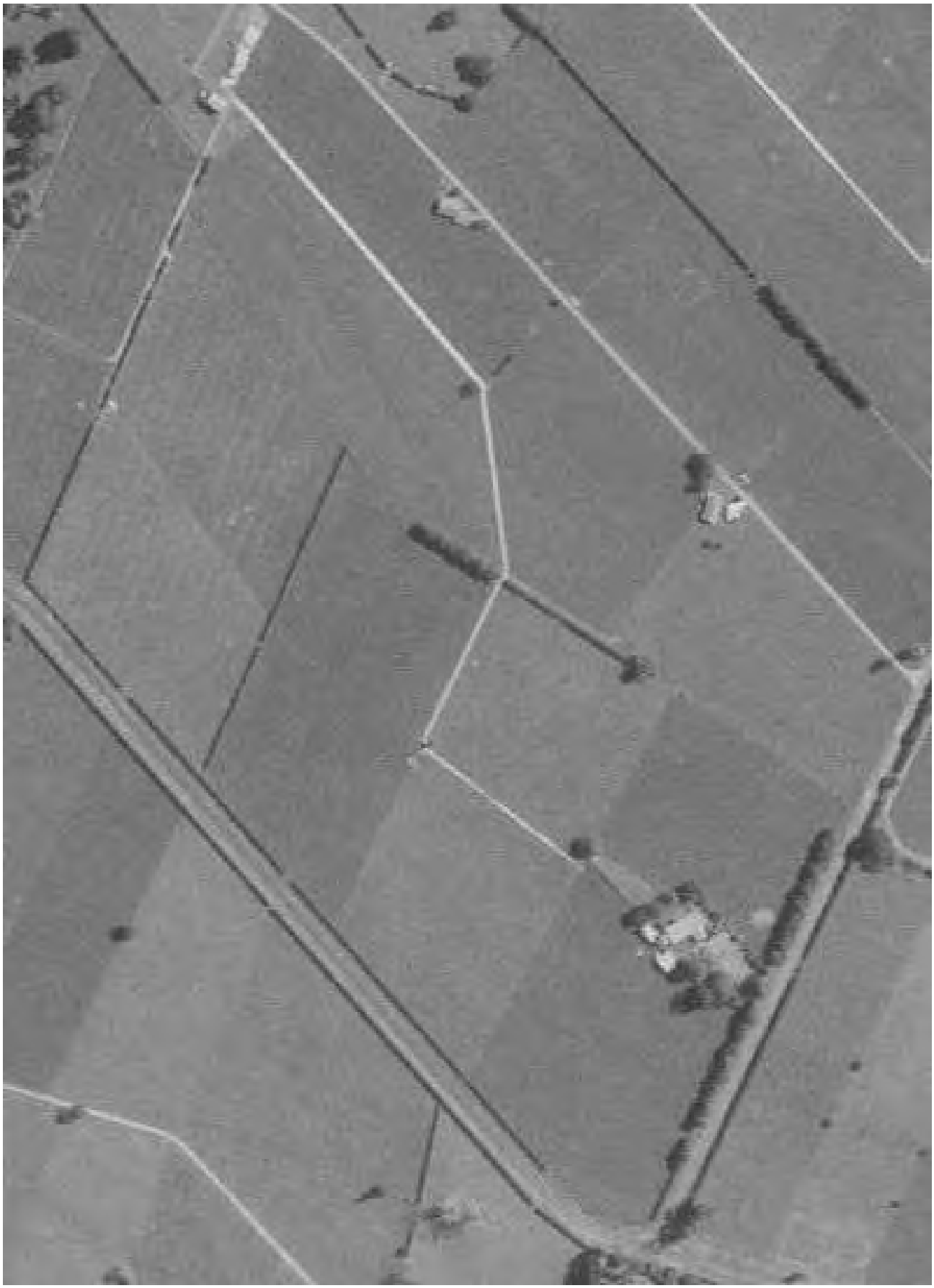
Document Set ID: 6574206
Version: 3, Version Date: 02/12/2025



25-10-1979

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Document Set ID: 6574206
Version: 3, Version Date: 02/12/2025



16-02-1995

Sourced from Waikato District Council Intramaps GIS



2008

Sourced from Waikato District Council Intramaps GIS



2017

Sourced from Waikato District Council Intramaps GIS



2025

Document Set ID: 6574206
Version: 3, Version Date: 02/12/2025

Appendix G Aerial imagery

Client:

Contractor:

BCD GROUP

Sheet: Retrolens Photos

Project Title: Waikato Thoroughbred Racing
Pencarrow, Hooker and Duncan Roads

Revision	Date	By	Reason
01	11/12/2025	SL	Masterplanning

Drawn: SL
Engineer: SL

Scale: NA

At: A3

Job Number: 23-1883

Sheet Number:

Revision: 01

All dimensions to be verified on site before making any shop drawings or commencing any work

The copyright of this drawing remains with BCD Group

Client:

Contractor:

BCD GROUP

Sheet: Retrolens Photos

Project Title: Waikato Thoroughbred Racing
Pencarrow, Hooker and Duncan Roads

Revision	Date	By	Reason
01	11/12/2025	SL	Masterplanning

Drawn: SL
Engineer: SL

Scale: NA

At: A3

Job Number: 23-1883

Sheet Number:

Revision: 01

All dimensions to be verified on site before making any shop drawings or commencing any work

The copyright of this drawing remains with BCD Group

Appendix H Sampling locations



Notes:
Elevation Contours are in terms of NZVD2016, generated using QGIS based on 2021 Lidar sourced from LINZ.
Aerial imagery, property boundaries, etc sourced from LINZ.

Client: WAIKATO THOROUGHBRED RACING — TE RAPA · CAMBRIDGE · WAIPA

Contractor: BCD GROUP

Sheet: Geotechnical Investigation Plan

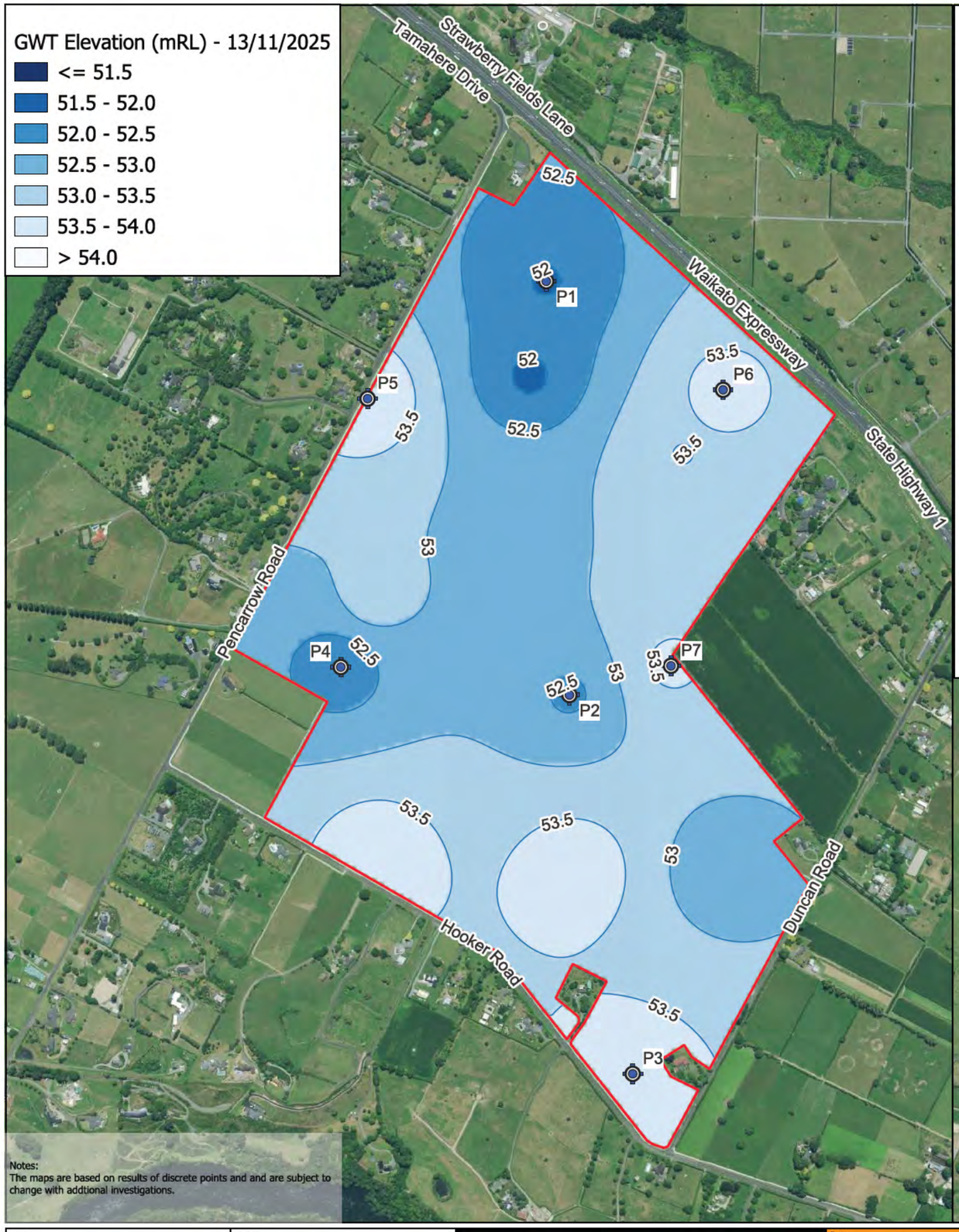
Project Title: Waikato Thoroughbred Racing
Pencarrow, Hooker & Duncan Roads

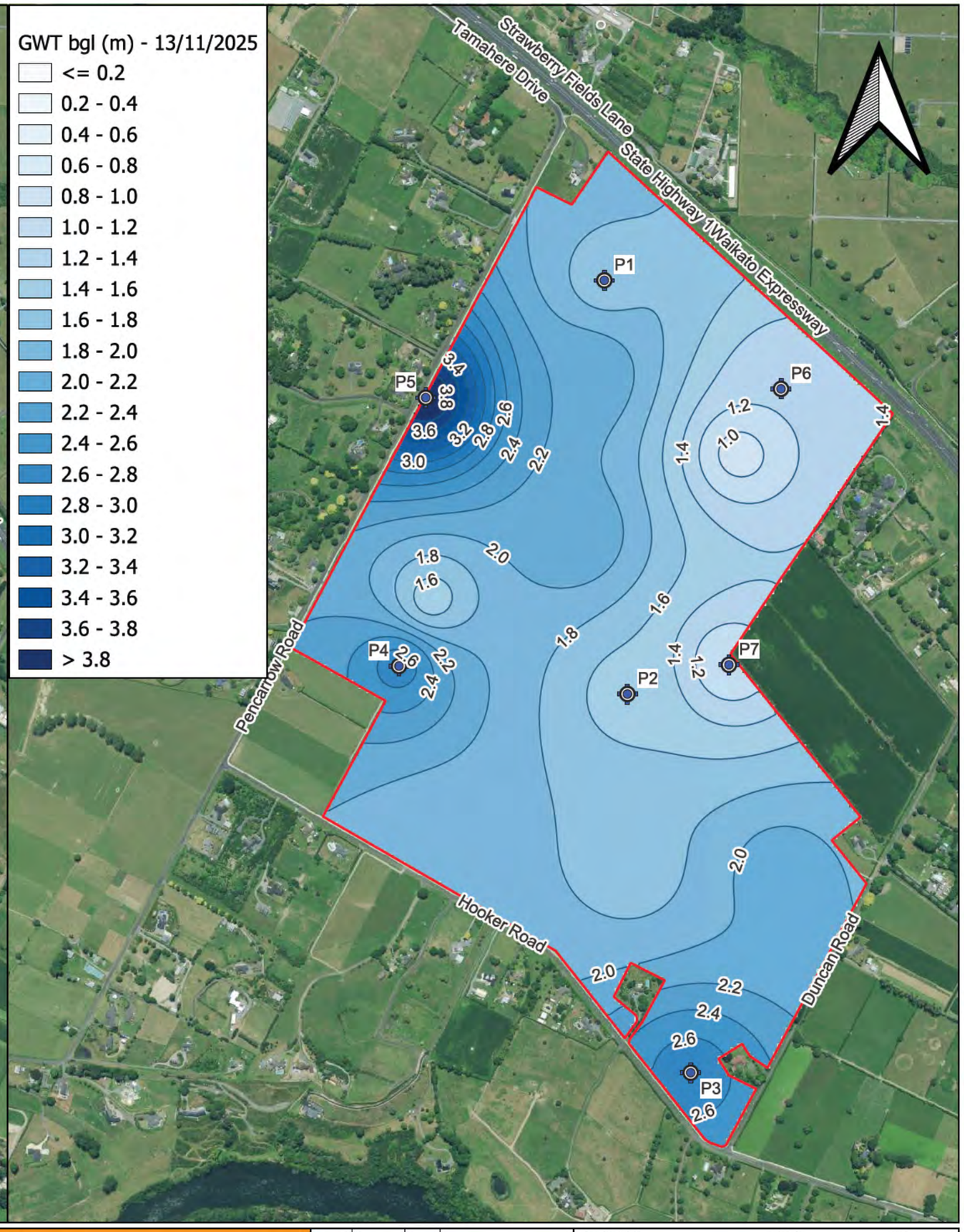
Revision	Date	By	Reason
01	25/11/2025	BB	Master Planning

Drawn: BB
Engineer: BB
SCALE: 1:8000
At: A3
Job Number: 23-1883
Sheet Number: G-03
Revision: 01

All dimensions to be verified on site before making any shop drawings or commencing any work

The copyright of this drawing remains with BCD Group





Client: WAIKATO THOROUGHBRED RACING — TE HAPA · CAMBRIDGE · WAIPA

Contractor:

BCD GROUP

Sheet: Groundwater Map

Project Title: Waikato Thoroughbred Racing
Pencarrow, Hooker & Duncan Roads

Revision	Date	By	Reason
01	25/11/2025	BB	Master Planning

Drawn: BB
Engineer: BB
Scale: 10,000
At: A3
Job Number: 23-1883
Sheet Number: G-04
Revision: 01

All dimensions to be verified on site before making any shop drawings or commencing any work

The copyright of this drawing remains with BCD Group

Soil Description

Log Identification: HA01

R.L.
NZVD2016: 54m

Coordinates (NZTM):
N: 5807874.40, E: 1809849.35

Investigation method: Hand Auger (50mm)

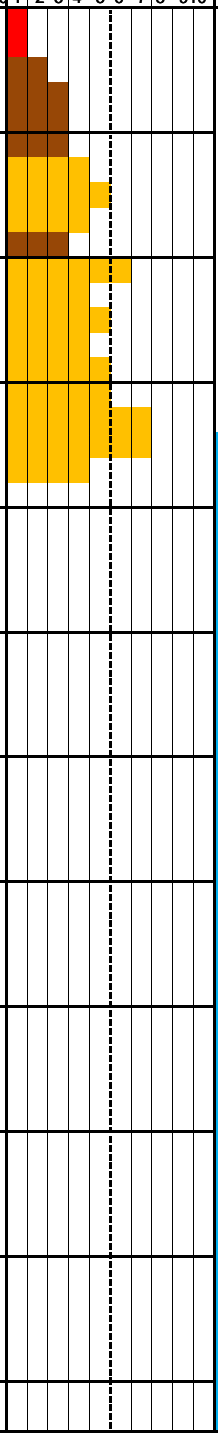
Depth (meters)	Field Description	Geological Unit
	TOPSOIL; dark brown. Moist.	TS
	SILT with some fine sand; light grey. Stiff, moist, sensitive, non-plastic.	Hinuera Formation
0.5	Silty fine **SAND**; light grey with trace orange mottles. Medium dense, moist.	
1.0	Sandy **SILT**; light grey. Very stiff, moist, moderately sensitive to sensitive, moist, non-plastic.	
	- Becomes wet.	
1.5	- Becomes saturated.	
	- Contains trace subrounded medium pumice gravels.	
2.0		
	- Colour includes trace orange mottles.	
2.5		
	- Sand becomes absent	
3.0	**End of hand auger at 3.0m** - Target depth.	
3.5		
4.0		
4.5		
5.0		
5.5	Groundwater encountered at 1.7m during testing.	

Field Test Data

Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity
0.5	94	15	6.2
1.5	115	42	2.7
	179	30	5.9
2.0	106	18	5.8
2.5	197	38	5.2
3.0	109	30	3.6

Scala Penetrometer (blows per 100mm drop)

Blow count
1
1
2
3
3
3
4
5
4
3
6
4
5
4
5
5
7
7
4



Groundwater Level

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 13/11/2025
Logged By: SC
Checked By: LR

Soil Description

Log Identification: HA02

R.L.
NZVD2016: 55m

Coordinates (NZTM):
N: 5807506.46, E: 1810136.80

Investigation method	Depth (meters)	Field Description	Geological Unit
Hand Auger (50mm)	0	**TOPSOIL**; dark brown. Moist.	TS
	0.5	**SILT** with trace fine sand; orange brown. Stiff to very stiff, moist, sensitive, non-plastic. - Colour becoming greyish orange.	Hinuera Formation
	1.0	Silty fine **SAND**; light grey. Loose to dense, wet - Becoming saturated - Sand becoming fine to medium.	
	1.5	Gravelly fine to medium **SAND**; greyish brown. Medium dense to dense saturated. Gravels fine to medium and subrounded	
	2.0	Sandy **SILT**; light greyish brown. Stiff, insensitive, saturated slightly plastic.	
	2.5	Fine to medium **SAND**; greyish brown. Medium dense, saturated.	
	3.0	**End of hand auger at 2.2m** - Continual collapse.	
	3.5		
	4.0		
	4.5		
	5.0		
	5.5	Groundwater encountered at 0.9m after testing.	

Field Test Data

Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Blow count
0				1
				2
				2
	83	15	5.5	2
				1
0.5				1
	182	35	5.2	3
				2
				3
				3
1.0				4
				4
				7
				9
				9
1.5				10
				5
				4
	64	42	1.5	5
				7
2.0				5
				5
				6
				6
				5
2.5				6
				6
				4
				3
3.0				
3.5				
4.0				
4.5				
5.0				
5.5				

Scala Penetrometer (blows per 100mm drop)

Plot of Scala results

Very loose | Loose | Medium Dense | Dense

0 1 2 3 4 5 6 7 8 9 10

Groundwater Level

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 13/11/2025
Logged By: OT
Checked By: LR

Soil Description

Log Identification: HA03

R.L.
NZVD2016: 55m

Coordinates (NZTM):
N: 5807064.54, E: 1810112.59

Investigation method	Depth (meters)	Field Description	Geological Unit	Depth (meters)
Hand Auger (50mm)		**TOPSOIL**; dark brown. Moist.	TS	
		Sandy **SILT**; light orange brown with orange streaks. Stiff, moist, moderately sensitive, slightly plastic.	Hinuera Formation	
		- becoming moderately plastic and wet.		
	0.5	Silty fine **SAND**; light greyish brown with orange mottles. Loose to medium dense, wet.		0.5
		Sandy **SILT**; light grey. Very stiff, wet, sensitive, moderately plastic. Sand is fine.		
	1.0	Silty fine to medium **SAND**; light grey. Loose to dense, saturated.		1.0
	1.5	- 10mm thick organic silt.		1.5
		Sandy **SILT**; light brown. Stiff to very stiff*, saturated, slightly plastic.		
	2.0	**End of hand auger at 2.0m** - No sample retained.		2.0
	2.5			2.5
	3.0			3.0
	3.5			3.5
	4.0			4.0
	4.5			4.5
	5.0			5.0
	5.5	Groundwater encountered at 1m during testing.		5.5

Field Test Data

Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Scala Penetrometer (blows per 100mm drop)
				2
				3
				2
	98	30	3.3	2
				4
0.5				2
				2
				2
				4
1.0	106	23	4.7	8
				5
				4
				4
				3
				5
1.5				4
				3
				8
				6
				5
2.0				8
				6
				4
				8
				9
2.5				4
3.0				
3.5				
4.0				
4.5				
5.0				
5.5				

Plot of Scala results: 0 | Very loose 1 2 3 | Loose 4 5 | Medium Dense 6 7 | Dense 8 9 10

Groundwater Level

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 12/11/2025
Logged By: OT
Checked By: LR

Soil Description

Log Identification: HA04

R.L.
NZVD2016: 54m

Coordinates (NZTM):
N: 5806205.72, E: 1810032.91

Investigation method	Depth (meters)	Field Description	Geological Unit	Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Blow count	Scala Penetrometer (blows per 100mm drop) Plot of Scala results (Very loose / Loose / Medium Dense / Dense)	Groundwater Level
Hand Auger (50mm)	0	**TOPSOIL**; dark brown. Moist.	TS	0				2		
								2		
		Sandy **SILT**; orange brown. Stiff to very stiff, moist, insensitive to moderately sensitive. Sand is fine.	Hinuera Formation					2		
					121	42	2.9	3		
	0.5			0.5				1		
								1		
		Fine to medium **SAND** with some silt; light orange brown. Loose to dense, moist.			61	38	1.6	2		
								2		
	1.0	- Sand becoming medium to coarse. Containing reddish orange staining.		1.0				2		
								3		
		Gravelly coarse **SAND**; light brownish grey. Dense, moist to wet.						6		
								17		
	1.5			1.5				11		
								11		
								8		
								12		
								12		
								10		
								10		
	2.0	End of 50mm hand auger at 2.0m - Obstruction due to gravels. Hole rebored with 100mm auger.		2.0				6		
Hand Auger (100mm)								6		
								4		
								3		
	2.5	- Becoming saturated.		2.5				5		
								3		
								4		
								3		
								1		
		SILT; light orange brown. Stiff, saturated, slightly plastic.						2		
	3.0			3.0						
		End of hand auger at 3.2m - Target depth.								
	3.5			3.5						
	4.0			4.0						
	4.5			4.5						
	5.0			5.0						
	5.5			5.5						
		Groundwater encountered at 2.7m during testing.								

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 10/11/2025
Logged By: SL
Checked By: LR

Soil Description

Log Identification: HA05

R.L.
NZVD2016: 55m

Coordinates (NZTM):
N: 5807062.36, E:1809416.68

Investigation method	Depth (meters)	Field Description	Geological Unit	Depth (meters)
		TOPSOIL; dark brown. Moist.	TS	
		SILT; dark orange brown. Very stiff, moist, moderately sensitive, slightly plastic.		
	0.5			0.5
		Fine to medium **SAND** with trace silt; orange brown. Loose to dense, moist.		
	1.0			1.0
		- Sand becoming medium to coarse.		
	1.5			1.5
		- containing trace fine to medium subrounded gravel. Colour becoming light greyish brown.		
	2.0			2.0
		- Becoming wet.		
		SILT; light grey. Stiff to very stiff*, moist to wet, slightly plastic.		
	2.5			2.5
		- Becoming saturated		
		Silty medium **SAND**; light grey. Medium dense, saturated.		
	3.0	**End of hand auger at 3.0m** - Target depth.		3.0
	3.5			3.5
	4.0			4.0
	4.5			4.5
	5.0			5.0
	5.5			5.5
		Groundwater encountered at 2.7m during testing.		

Hand Auger (50mm)

Hinuera Formation

Field Test Data

Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Scala Penetrometer (blows per 100mm drop) Blow count
0.5	182	45	4.0	1
				1
				2
				3
				1
1.0				1
				1
				1
				2
				5
1.5				9
				9
				8
				7
				6
2.0				8
				4
				4
				5
				5
2.5				6
				5
				5
				5
				6
3.0				3
				3
				4
				5
				4

Scala Penetrometer (blows per 100mm drop)

Plot of Scala results: Very loose (1) | Loose (2 3) | Medium Dense (4 5 6 7) | Dense (8 9 10)

Groundwater Level

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 14/11/2025
Logged By: SL
Checked By: LR

Soil Description

Log Identification: HA06

R.L.
NZVD2016: 58m

Coordinates (NZTM):
N: 5807604.09, E: 1809477.59

Field Test Data

Investigation method	Depth (meters)	Field Description	Geological Unit	Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Scala Penetrometer (blows per 100mm drop) Blow count	Plot of Scala results (Very loose / Loose / Medium Dense / Dense; 0 1 2 3 4 5 6 7 8 9 10)	Groundwater Level
Hand Auger (50mm)	0	**TOPSOIL**; dark brown. Moist.	TS	0						
		Clayey **SILT**; dark brown. Stiff to very stiff, moist, insensitive to sensitive, slightly plastic.	Walton Subgroup		182	68	2.7			
	0.5			0.5	174	91	1.9			
		- Becoming light brown.			197	106	1.9			
	1.0			1.0	166	68	2.4			
	1.5			1.5	166	53	3.1			
					144	45	3.2			
	2.0			2.0	136	45	3.0			
	2.5			2.5	76	23	3.3			
		- becoming moderately plastic.			76	30	2.5			
	3.0	**End of hand auger at 3.0m** - Target depth.		3.0						
	3.5			3.5						
	4.0			4.0						
	4.5			4.5						
	5.0			5.0						
	5.5	Groundwater not encountered during testing		5.5						

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 14/11/2025
Logged By: SL
Checked By: LR

Soil Description

Log Identification: HA07

R.L.
NZVD2016: 54m

Coordinates (NZTM):
N: 5807673.70, E: 1809818.62

Investigation method	Depth (meters)	Field Description	Geological Unit	Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Blow count	Scala Penetrometer (blows per 100mm drop) Plot of Scala results (Very loose / Loose / Medium Dense / Dense)	Groundwater Level
Hand Auger (50mm)	0	**TOPSOIL**; dark brown. Moist.	TS	0				1		
		SILT; light orange brown. Stiff to very stiff, moist, moderately sensitive to sensitive, non-plastic.	Hinuera Formation		106	23	4.7	2		
	0.5	- colour becoming light brown with trace orange mottles.		0.5				2		
		Fine to medium **SAND**; light grey with trace orange mottles. Loose to dense, moist.			91	38	2.4	4		
	1.0	- 100mm thick SILT lens. - Sand becoming silty fine sand.		1.0				2		
	1.5			1.5				1		
								2		
								5		
	2.0	- Becoming wet. - Becoming saturated.		2.0				6		
								4		
								5		
	2.5			2.5				5		
								4		
								5		
								5		
								6		
								5		
								9		
								6		
								7		
								7		
								6		
								8		
								5		
								6		
								7		
								6		
	3.0	**End of hand auger at 2.8m** - No sample retained.		3.0						
	3.5			3.5						
	4.0			4.0						
	4.5			4.5						
	5.0			5.0						
	5.5			5.5						
		Groundwater encountered at 2.2m during testing.								

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 14/11/2025
Logged By: SL
Checked By: LR

Soil Description

Log Identification: HA08

R.L.
NZVD2016: 55m

Coordinates (NZTM):
N: 5807643.79, E: 1810221.65

Investigation method: Hand Auger (50mm)

Depth (meters)	Field Description	Geological Unit
	TOPSOIL; dark brown. Moist.	TS
	SILT with trace fine sand; orange brown. Stiff, dry to moist, sensitive, non-plastic to slightly plastic.	Hinuera Formation
0.5		
	SILT; light grey. Very stiff, moist, sensitive, slightly plastic.	
1.0	- Becoming sandy and moist to wet.	
	Silty fine to coarse **SAND**; light grey. Loose to dense, saturated.	
1.5	- Colour becomes reddish brown. - Colour becomes brownish grey.	
	End of hand auger at 1.8m - Continual collapse.	
2.0		
2.5		
3.0		
3.5		
4.0		
4.5		
5.0		
5.5	Groundwater encountered at 1.2m during testing.	

Field Test Data

Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Blow count
				1
				2
				2
	95	23	4.2	2
				2
0.5				2
	148	30	4.9	4
				2
	156	20	7.9	2
1.0				4
				2
				4
				5
				6
1.5				12
				13
				15
				6
				4
				3
2.0				4
				3
				4
				6
2.5				3
				5
				7
				5
3.0				5
3.5				
4.0				
4.5				
5.0				
5.5				

Scala Penetrometer (blows per 100mm drop)

Plot of Scala results: Very loose | Loose | Medium Dense | Dense (0 1 2 3 4 5 6 7 8 9 10)

Groundwater Level

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 13/11/2025
Logged By: OT
Checked By: LR

Soil Description

Log Identification: HA09

R.L.
NZVD2016: 54m

Coordinates (NZTM):
N: 5806999.101, E: 1809890.037

Investigation method	Depth (meters)	Field Description	Geological Unit
Hand Auger (50mm)	0	**TOPSOIL**; dark brown. Moist.	TS
		SILT; light orange brown with orange streaks. Stiff to very stiff*, dry, non-plastic.	Hinuera Formation
	0.5	Fine **SAND**; light orange grey. Medium dense, moist.	
		Sandy **SILT**; light orange grey. Stiff to very stiff, moist, moderately sensitive to sensitive, slightly plastic.	
	1.0	- Colour becoming brownish grey.	
	1.5	Fine **SAND** with some silt; light grey. Medium dense to dense, saturated.	
		- poor sample return	
	2.0	**End of hand auger at 2.0m** - No sample retained.	
	2.5		
	3.0		
	3.5		
	4.0		
	4.5		
	5.0		
	5.5	Groundwater encountered at 1.5m during testing.	

Field Test Data

Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Blow count
0				2
				3
				1
				2
0.5				3
				5
				4
				4
	189	30	6.3	5
1.0				4
				4
				3
	61	23	2.7	2
				2
1.5				4
				6
				6
				6
				10
2.0				7
				9
				10
				7
				7
2.5				6
				7
				8
				5
				5
3.0				
3.5				
4.0				
4.5				
5.0				
5.5				

Scala Penetrometer (blows per 100mm drop)

Plot of Scala results: Very loose | Loose | Medium Dense | Dense (0 1 2 3 4 5 6 7 8 9 10)

Groundwater Level

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 12/11/2025
Logged By: SL
Checked By: LR

Soil Description

Log Identification: HA10

R.L.
NZVD2016: 55m

Coordinates (NZTM):
N: 5806635.13, E: 1810217.40

Investigation method	Depth (meters)	Field Description	Geological Unit	Depth (meters)
Hand Auger (50mm)	0	**TOPSOIL**; dark brown. Moist.	TS	0
	0.5	Sandy **SILT**; dark orange brown. Stiff*, moist, slightly plastic. Sand is fine. - colour becoming light orange brown with orange mottling.	Hinuera Formation	0.5
		Silty fine **SAND**; light brown with orange streaks. Loose, moist.		
	1.0	Sandy **SILT**; light brownish grey. Very stiff, moist, sensitive, slightly plastic.		1.0
	1.5	Silty fine to medium **SAND**; light brownish grey. Medium dense to dense, moist. - Colour includes orange mottling and brown streaks.		1.5
	2.0	- Colour becoming dark brown. - Becoming wet. - Becoming saturated. - Sand becoming fine		2.0
	2.5			2.5
	3.0	**End of hand auger at 2.7m** - No sample retained.		3.0
	3.5			3.5
	4.0			4.0
	4.5			4.5
	5.0			5.0
	5.5	Groundwater encountered at 2.1m during testing.		5.5

Field Test Data

Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Blow count (Scala Penetrometer, blows per 100mm drop)
0				4
				3
				2
				2
0.5				1
				4
				2
				3
1.0	159	23	7.0	2
				3
				6
				8
				17
				18
1.5				8
				16
				12
				6
				7
2.0				8
				6
				10
				12
				12
2.5				18
3.0				
3.5				
4.0				
4.5				
5.0				
5.5				

Scala Penetrometer (blows per 100mm drop)
Plot of Scala results: Very loose | Loose | Medium Dense | Dense
0 1 2 3 4 5 6 7 8 9 10

Groundwater Level

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 12/11/2025
Logged By: OT
Checked By: LR

Soil Description

Log Identification: HA11

R.L.
NZVD2016: 56m

Coordinates (NZTM):
N: 5806630.24, E: 1809912.81

Investigation method	Depth (meters)	Field Description	Geological Unit
Hand Auger (50mm)	0	Sandy **TOPSOIL**; dark brown. Moist.	TS
	0.5	Fine to medium **SAND** with some silt; greyish brown orange brown mottling. Loose to dense, moist.	Hinuera Formation
	1.0	- Sand becoming coarse and containing trace fine subrounded to sub angler gravel. Containing orange brown staining. - Sand becoming fine to medium and wet.	
	1.5	**SILT**; whitish grey. Stiff, moist, moderately sensitive, slightly plastic.	
	2.0	Fine **SAND** with some silt; light brown. Loose to medium dense, wet to saturated. - becoming saturated.	
	2.5	**SILT** with trace fine sand; light grey with dark brown speckles. Stiff to very stiff*, moist to wet, slightly plastic.	
	3.0	Fine to medium **SAND**; light grey. Medium dense, saturated.	
	3.5	**End of hand auger at 2.7m** - Continual collapse	
	4.0		
	4.5		
	5.0		
	5.5	Groundwater encountered at 1.7m after testing.	

Field Test Data

Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Scala Penetrometer (blows per 100mm drop) Blow count	Plot of Scala results (Very loose / Loose / Medium Dense / Dense)	Groundwater Level
0				3		
				4		
				5		
				3		
0.5				5		
				8		
				4		
				5		
1.0				5		
				8		
				9		
				4		
				5		
1.5	91	30	3.0	6		
				4		
				5		
				5		
2.0				2		
				1		
				4		
				5		
				7		
2.5				6		
				5		
				5		
				5		
3.0				4		
3.5						
4.0						
4.5						
5.0						
5.5						

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 10/11/2025
Logged By: SL **Checked By: LR**

Soil Description

Log Identification: HA12

R.L.
NZVD2016: 55m

Coordinates (NZTM):
N: 5806676.19, E: 1809501.35

Investigation method	Depth (meters)	Field Description	Geological Unit
Hand Auger (50mm)	0	**TOPSOIL**; dark brown. Moist.	TS
		SILT; light orange grey. Very Stiff, dry to moist, moderately sensitive, slightly plastic.	Hinuera Formation
	0.5	Silty medium **SAND**; light greyish brown with dark orange brown inclusions. Medium dense, moist.	
		Medium to coarse **SAND** with trace silt; Light greyish brown. Medium dense, wet.	
	1.0	- Becoming wet to saturated.	
	1.5		
	2.0	Fine to medium **SAND**; light grey. Loose to medium dense, wet to saturated. Dilatant.	
		Sandy **SILT**; light grey. Stiff, wet to saturated, moderately sensitive, slightly plastic. Dilatant.	
	2.5	- 50mm fine sand lens. - 50mm organic silt lens	
		Silty fine **SAND**; light grey with orange mottling. Medium dense to dense, saturated	
		- Silt absent. Sand becoming coarse and dark brown.	
	3.0	**End of hand auger at 2.9m** - No sample retained.	
	3.5		
	4.0		
	4.5		
	5.0		
	5.5	Groundwater encountered at 1.8m during testing.	

Field Test Data

Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Blow count
0				2
				4
				2
				3
0.5				1
	166	42	3.9	3
				6
				5
				5
1.0				5
				5
				6
				4
1.5				5
				4
				3
				4
2.0				4
				2
				3
				2
	53	23	2.3	4
2.5				6
				7
				6
				9
3.0				10
3.5				
4.0				
4.5				
5.0				
5.5				

Scala Penetrometer (blows per 100mm drop)

Plot of Scala results

Very loose | Loose | Medium Dense | Dense

0 1 2 3 4 5 6 7 8 9 10

Groundwater Level

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 10/11/2025
Logged By: SL
Checked By: LR

Soil Description

Log Identification: HA13

R.L.
NZVD2016: 55m

Coordinates (NZTM):
N: 5807337.17, E:1809796.55

Investigation method	Depth (meters)	Field Description	Geological Unit	Depth (meters)
Hand Auger (50mm)	0.0	**TOPSOIL**; dark brown. Moist.	TS	0.0
	0.5	Silty fine to medium **SAND**; light brown with orange streaks. Loose to medium dense, moist - Silt absent. Sand becomes fine.	Hinuera Formation	0.5
	1.0	**SILT**; light brown. Very Stiff, most, sensitive, slightly plastic.		1.0
	1.5	Fine to medium **SAND**; light grey. Medium dense to dense, wet. - becomes saturated.		1.5
	2.0	**SILT**; light grey. Stiff to very stiff*, saturated, slightly plastic. - 50mm organic silt lens.		2.0
	2.2	**End of hand auger at 2.2m** - No sample retained.		2.5
	3.0			3.0
	3.5			3.5
	4.0			4.0
	4.5			4.5
	5.0			5.0
	5.5	Groundwater encountered at 1.6m during testing.		5.5

Field Test Data

Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Scala Penetrometer (blows per 100mm drop) Blow count
0.0				3
				1
				2
				4
0.5				3
				4
				4
				4
1.0				3
	136	30	4.5	4
				3
				6
1.5				9
				10
				12
				7
				5
2.0				6
				6
				3
				4
2.5				3
				6
				9
				7
3.0				7
				7
				8
3.5				
4.0				
4.5				
5.0				
5.5				

Plot of Scala results: 0 | Very loose 1 | Loose 2 3 | Medium Dense 4 5 6 | Dense 7 8 9 10

Groundwater Level

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 14/11/2025
Logged By: SL
Checked By: LR

Soil Description

Log Identification: HA14

R.L.
NZVD2016: 55m

Coordinates (NZTM):
N: 5807208.26, E: 1809494.55

Investigation method	Depth (meters)	Field Description	Geological Unit	Depth (meters)
Hand Auger (50mm)	0	**TOPSOIL**; dark brown with trace fine to medium subangular gravel. Dry.	TS	0
	0.5	**SILT** with trace fine sand; greyish brown with light grey, orange brown and dark brown streaks. Stiff to very stiff, moist, moderately sensitive, slightly plastic.	Hinuera Formation	0.5
	1.0	- Becoming sandy and moist to wet. Sand is fine. - 100mm thick organic silt layer; dark brown.		1.0
	1.5	Coarse **SAND** with some silt; light grey. Loose to medium dense, moist to wet. - Becoming saturated.		1.5
	2.0	Sandy **SILT**; light grey. Stiff to very stiff*, wet, non-plastic.		2.0
	2.5	Silty fine **SAND**; light grey. Medium dense to dense, wet. - becoming saturated.		2.5
	3.0	**End of hand auger at 2.4m** - No sample retained.		3.0
	3.5			3.5
	4.0			4.0
	4.5			4.5
	5.0			5.0
	5.5	Groundwater encountered at 1.5m during testing.		5.5

Field Test Data

Depth (meters)	Peak Vane Shear Strength (kPa)	Residual Vane Shear Strength (kPa)	Sensitivity	Blow count	Groundwater Level
0				2	
				2	
				2	
				2	
0.5	182	30	6.0	2	
				3	
	91	15	6.0	3	
				4	
1.0				4	
				3	
				4	
				7	
				4	
1.5				3	
				3	
				3	
				3	
				6	
2.0				OB	
				OB	
				5	
				4	
				6	
2.5				6	
				9	
				6	
				7	
3.0				7	
3.5					
4.0					
4.5					
5.0					
5.5					

Scala Penetrometer (blows per 100mm drop)

Plot of Scala results

Very loose | Loose | Medium Dense | Dense

0 1 2 3 4 5 6 7 8 9 10

Notes:
1. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
2. OB refers to hand auger over bored. HW refers to scala falling under the weight of the hammer. TS refers to topsoil. * refers to consistency based on diagnostic features
3. Soils have been described in general accordance with NZ Geomechanics Society "Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes", December 2005
4. Vane shear strengths (where reported) have been corrected in general accordance with NZ Geotech Society Inc. "Guideline for Hand Held Shear Vane Test", August 2001.
5. Scala Penetrometer testing (where reported) has been carried out in general accordance with NZS 4402 Test 6.5.2.
6. Coordinates (where reported) are presented in NZTM2000 to an accuracy of ±5m.
7. Shear vane results are multiplied by factor A and plus factor B where applicable

BCD GROUP

Job Number: 23-1883
Client: WTR Waikato Thoroughbred Racing

Shear Vane ID:3294 (19mm blade)
Calibration Expiry Date: 5/08/2026
Shear Vane Factors: A: 1.513

Location: Pencarrow Road / Hooker Road / Duncan Road

Date Of Investigation: 14/11/2025
Logged By: SL
Checked By: LR

Appendix I Laboratory results

Pencarrow Road Results Summary

23-1883

	Sample	HA 01.1	HA 01.2	HA 01.3	HA 02.1	HA 02 2	HA 02.3	HA 03.1	HA 03.2	HA 03 3	HA 04.1	HA 04 2	HA 04.3	HA 05.1	HA 05.2	HA 05.3	HA 06.1	HA 06.2	HA 06 3	HA 07.1	HA 07.2	HA 07.3	HA 08.1	HA 08.2	HA 08.3	HA 10.1	HA 10.2	HA 10 3	HA 11.1	HA 11.2	HA 11.3	HA 12.1	HA 12.2	HA 12.3	HA 13.1	HA 13.2	HA 13 3	HA 14.1	HA 14.2	HA 14 3	HA 15.1	HA 15.2	HA 15.3	Waikato Background Concentrations	WasteMinz Class 2 Acceptance Criteria	Waikato Clean Fill Acceptance Criteria	NES Guidelines	NES Guidelines
	Laboratory number	4031741.1	4031741.2	4031741.3	4031741.4	4031741.5	4031741.6	4030554.7	4030554.8	4030554.9	4029460.7	4029460.8	4029460.9	4032427.7	4032427.8	4032427.9	4032427.1	4032427.1	4032427.1	4032427.1	4032427.2	4032427 3	4031741.7	4031741.8	4031741.9	4030554.1	4030554.2	4030554.3	4030554.4	4030554.5	4030554.6	4029460.4	4029460.5	4029460.6	4029460.1	4029460.2	4029460.3	4032427.4	4032427.5	4032427.6	4032427.1	4032427.1	4032427.2					
	Depth	0.3	0.7	1	0.2	0.6	1.1	0.2	0.7	1.3	0.3	0.7	1	0 5	0.9	1.3	0.4	0.7	1	0.4	0.8	1.2	0 3	0.6	1.1	0.2	0.6	1	0.4	0 9	1.2	0.3	0.7	1	0.3	0.6	1	0.4	0 9	1.1	0.4	0.8	1.2					
	Sample Date	13/11/2025	13/11/2025	13/11/2025	13/11/2025	13/11/2025	13/11/2025	12/11/2025	12/11/2025	12/11/2025	11/11/2025	11/11/2025	11/11/2025	14/11/2025	14/11/2025	14/11/2025	14/11/2025	14/11/2025	14/11/2025	14/11/2025	14/11/2025	14/11/2025	13/11/2025	13/11/2025	13/11/2025	12/11/2025	12/11/2025	12/11/2025	12/11/2025	12/11/2025	12/11/2025	11/11/2025	11/11/2025	11/11/2025	11/11/2025	11/11/2025	11/11/2025	14/11/2025	14/11/2025	14/11/2025	14/11/2025	14/11/2025	14/11/2025					
Heavy Metals	Arsenic	6	4	2	8	6	3	8	<2	<2	5	4	5	6	5	3	5	3	3	3	7	<2	11	5	3	10	7	12	6	2	2	24	7	3	6	5	4	4	6	3	4	3	<2	6.8	20	17	70	20
	Cadmium	<0.10	<0.10	<0.10	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.18	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.18	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.22	4	0 8	1300	3
	Chromium	6	5	4	13	7	6	5	3	4	7	7	6	7	10	9	19	26	15	7	10	5	12	5	6	9	4	5	7	8	7	9	13	5	6	9	8	6	7	5	5	6	8	30	20	56	6300	460
	Copper	4	4	5	3	3	3	4	3	2	7	5	3	7	8	6	30	52	70	5	6	5	13	3	3	8	6	10	4	8	5	9	6	7	5	6	6	4	7	6	6	5	4	25	30	120	10,000	10,000
	Lead	11.9	10.4	10.2	14.8	17.4	12	13	6.9	5.3	13.9	12	7.1	7 2	6.9	7.2	20	18.2	27	11.6	7.1	7.1	17.8	16.4	12 2	7.4	6.4	4.9	8.6	12.5	6.5	23	7.9	6.4	15.1	5.9	6.1	10.9	10.4	8.7	10 2	9.5	7	20	20	78	3300	210
	Mercury	<0.10	<0.10	<0.10	0.24	<0.10	<0.10	0.12	<0.10	<0.10	0.12	<0.10	<0.10	0.15	<0.10	<0.10	0.34	0.16	0.11	<0.10	<0.10	<0.10	0.24	0.15	<0.10	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	0.13	0.1	<0.10	0.11	<0.10	<0.10	0.23	0.8	1	4200	310
	Nickel	3	3	3	6	2	<2	3	<2	<2	3	3	<2	4	4	3	9	11	11	3	5	<2	6	2	<2	4	3	3	<2	4	2	3	5	4	2	3	4	2	4	2	2	<2	2	7.6	20	33	1500	-
	Zinc	22	21	23	41	12	9	17	16	11	37	24	15	34	96	31	51	47	55	17	23	17	37	14	12	25	23	18	15	90	16	51	46	25	22	26	25	17	19	19	25	20	18	53	20	175	400,000	-
OCP	4,4 DDT	< 0.014	-	-	-	-	-	< 0.013	-	-	< 0.014	-	-	< 0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.013	-	-	-	-	-	< 0.013	-	-	< 0.013	-	-	< 0.013	-	-	-	110	120	1000	70
	Total DDT	< 0.09	-	-	-	-	-	< 0.08	-	-	< 0 09	-	-	< 0.09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.08	-	-	-	-	-	< 0.08	-	-	< 0.08	-	-	< 0.08	-	-	-	58	58	-	

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

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Certificate of Analysis

Client:	BCD Group Limited	**Lab No:**	4029460	SPv1
Contact:	Amber Kouwenhoven	**Date Received:**	11-Nov-2025	
	C/- BCD Group Limited	**Date Reported:**	25-Nov-2025	
	PO Box 13276	**Quote No:**	113268	
	Tauranga Central	**Order No:**	23-1883	
	Tauranga 3141	**Client Reference:**	23-1883	
		Submitted By:	Sara Legler	

Sample Type: Soil

Sample Name:		HA13.1 11-Nov-2025 12:00 pm	HA13.2 11-Nov-2025 12:00 pm	HA13.3 11-Nov-2025 12:00 pm	HA12.1 11-Nov-2025 1:00 pm	HA12.2 11-Nov-2025 1:00 pm
Lab Number:		4029460.1	4029460.2	4029460.3	4029460.4	4029460.5
Individual Tests						
Dry Matter	g/100g as rcvd	79	-	-	-	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	5	4	24	7
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	0.18	< 0.10
Total Recoverable Chromium	mg/kg dry wt	6	9	8	9	13
Total Recoverable Copper	mg/kg dry wt	5	6	6	9	6
Total Recoverable Lead	mg/kg dry wt	15.1	5.9	6.1	23	7.9
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	0.12	< 0.10
Total Recoverable Nickel	mg/kg dry wt	2	3	4	3	5
Total Recoverable Zinc	mg/kg dry wt	22	26	25	51	46
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.013	-	-	-	-
alpha-BHC	mg/kg dry wt	< 0.013	-	-	-	-
beta-BHC	mg/kg dry wt	< 0.013	-	-	-	-
delta-BHC	mg/kg dry wt	< 0.013	-	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013	-	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.013	-	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.013	-	-	-	-
2,4'-DDD	mg/kg dry wt	< 0.013	-	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.013	-	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.013	-	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.013	-	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.013	-	-	-	-
4,4'-DDT	mg/kg dry wt	< 0.013	-	-	-	-
Total DDT Isomers	mg/kg dry wt	< 0.08	-	-	-	-
Dieldrin	mg/kg dry wt	< 0.013	-	-	-	-
Endosulfan I	mg/kg dry wt	< 0.013	-	-	-	-
Endosulfan II	mg/kg dry wt	< 0.013	-	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.013	-	-	-	-
Endrin	mg/kg dry wt	< 0.013	-	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.013	-	-	-	-
Endrin ketone	mg/kg dry wt	< 0.013	-	-	-	-
Heptachlor	mg/kg dry wt	< 0.013	-	-	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.013	-	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.013	-	-	-	-
Methoxychlor	mg/kg dry wt	< 0.013	-	-	-	-

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil					
Sample Name:		HA12.3 11-Nov-2025 1:00 pm	HA4.1 11-Nov-2025 3:00 pm	HA4.2 11-Nov-2025 3:00 pm	HA4.3 11-Nov-2025 3:00 pm
Lab Number:		4029460.6	4029460.7	4029460.8	4029460.9
Individual Tests					
Dry Matter	g/100g as rcvd	-	76	-	-
Heavy Metals with Mercury, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	3	5	4	5
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	5	7	7	6
Total Recoverable Copper	mg/kg dry wt	7	7	5	3
Total Recoverable Lead	mg/kg dry wt	6.4	13.9	12.0	7.1
Total Recoverable Mercury	mg/kg dry wt	< 0.10	0.12	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	4	3	3	< 2
Total Recoverable Zinc	mg/kg dry wt	25	37	24	15
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	-	< 0.014	-	-
alpha-BHC	mg/kg dry wt	-	< 0.014	-	-
beta-BHC	mg/kg dry wt	-	< 0.014	-	-
delta-BHC	mg/kg dry wt	-	< 0.014	-	-
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.014	-	-
cis-Chlordane	mg/kg dry wt	-	< 0.014	-	-
trans-Chlordane	mg/kg dry wt	-	< 0.014	-	-
2,4'-DDD	mg/kg dry wt	-	< 0.014	-	-
4,4'-DDD	mg/kg dry wt	-	< 0.014	-	-
2,4'-DDE	mg/kg dry wt	-	< 0.014	-	-
4,4'-DDE	mg/kg dry wt	-	< 0.014	-	-
2,4'-DDT	mg/kg dry wt	-	< 0.014	-	-
4,4'-DDT	mg/kg dry wt	-	< 0.014	-	-
Total DDT Isomers	mg/kg dry wt	-	< 0.08	-	-
Dieldrin	mg/kg dry wt	-	< 0.014	-	-
Endosulfan I	mg/kg dry wt	-	< 0.014	-	-
Endosulfan II	mg/kg dry wt	-	< 0.014	-	-
Endosulfan sulphate	mg/kg dry wt	-	< 0.014	-	-
Endrin	mg/kg dry wt	-	< 0.014	-	-
Endrin aldehyde	mg/kg dry wt	-	< 0.014	-	-
Endrin ketone	mg/kg dry wt	-	< 0.014	-	-
Heptachlor	mg/kg dry wt	-	< 0.014	-	-
Heptachlor epoxide	mg/kg dry wt	-	< 0.014	-	-
Hexachlorobenzene	mg/kg dry wt	-	< 0.014	-	-
Methoxychlor	mg/kg dry wt	-	< 0.014	-	-

Summary of Methods

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

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-9
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required. US EPA 200.2 (modified), APHA 3125 B: Online Edition.	0.10 - 4 mg/kg dry wt	1-9
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	1, 7

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1, 7

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

Testing was completed between 21-Nov-2025 and 25-Nov-2025. For completion dates of individual analyses please contact the laboratory.

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

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



Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental

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Certificate of Analysis

Client:	BCD Group Limited	**Lab No:**	4030554	SPv1
Contact:	Amber Kouwenhoven	**Date Received:**	12-Nov-2025	
	C/- BCD Group Limited	**Date Reported:**	25-Nov-2025	
	PO Box 13276	**Quote No:**	113268	
	Tauranga Central	**Order No:**	23-1883	
	Tauranga 3141	**Client Reference:**	23-1883	
		Submitted By:	Sara Legler	

Sample Type: Soil

Sample Name:		HA 10.1 12-Nov-2025 11:00 am	HA 10.2 12-Nov-2025 11:00 am	HA 10.3 12-Nov-2025 11:00 am	HA 11.1 12-Nov-2025 1:00 pm	HA 11.2 12-Nov-2025 1:00 pm
Lab Number:		4030554.1	4030554.2	4030554.3	4030554.4	4030554.5
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	-	76	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	10	7	12	6	2
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	9	4	5	7	8
Total Recoverable Copper	mg/kg dry wt	8	6	10	4	8
Total Recoverable Lead	mg/kg dry wt	7.4	6.4	4.9	8.6	12.5
Total Recoverable Mercury	mg/kg dry wt	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	4	3	3	< 2	4
Total Recoverable Zinc	mg/kg dry wt	25	23	18	15	30
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	-	< 0.013	-
alpha-BHC	mg/kg dry wt	-	-	-	< 0.013	-
beta-BHC	mg/kg dry wt	-	-	-	< 0.013	-
delta-BHC	mg/kg dry wt	-	-	-	< 0.013	-
gamma-BHC (Lindane)	mg/kg dry wt	-	-	-	< 0.013	-
cis-Chlordane	mg/kg dry wt	-	-	-	< 0.013	-
trans-Chlordane	mg/kg dry wt	-	-	-	< 0.013	-
2,4'-DDD	mg/kg dry wt	-	-	-	< 0.013	-
4,4'-DDD	mg/kg dry wt	-	-	-	< 0.013	-
2,4'-DDE	mg/kg dry wt	-	-	-	< 0.013	-
4,4'-DDE	mg/kg dry wt	-	-	-	< 0.013	-
2,4'-DDT	mg/kg dry wt	-	-	-	< 0.013	-
4,4'-DDT	mg/kg dry wt	-	-	-	< 0.013	-
Total DDT Isomers	mg/kg dry wt	-	-	-	< 0.08	-
Dieldrin	mg/kg dry wt	-	-	-	< 0.013	-
Endosulfan I	mg/kg dry wt	-	-	-	< 0.013	-
Endosulfan II	mg/kg dry wt	-	-	-	< 0.013	-
Endosulfan sulphate	mg/kg dry wt	-	-	-	< 0.013	-
Endrin	mg/kg dry wt	-	-	-	< 0.013	-
Endrin aldehyde	mg/kg dry wt	-	-	-	< 0.013	-
Endrin ketone	mg/kg dry wt	-	-	-	< 0.013	-
Heptachlor	mg/kg dry wt	-	-	-	< 0.013	-
Heptachlor epoxide	mg/kg dry wt	-	-	-	< 0.013	-
Hexachlorobenzene	mg/kg dry wt	-	-	-	< 0.013	-
Methoxychlor	mg/kg dry wt	-	-	-	< 0.013	-

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The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil					
Sample Name:		HA 11.3 12-Nov-2025 1:00 pm	HA 3.1 12-Nov-2025 3:00 pm	HA 3.2 12-Nov-2025 3:00 pm	HA 3.3 12-Nov-2025 3:00 pm
Lab Number:		4030554.6	4030554.7	4030554.8	4030554.9
Individual Tests					
Dry Matter	g/100g as rcvd	-	74	-	-
Heavy Metals with Mercury, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	2	8	< 2	< 2
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	7	5	3	4
Total Recoverable Copper	mg/kg dry wt	5	4	3	2
Total Recoverable Lead	mg/kg dry wt	6.5	13.0	6.9	5.3
Total Recoverable Mercury	mg/kg dry wt	< 0.10	0.12	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	2	3	< 2	< 2
Total Recoverable Zinc	mg/kg dry wt	16	17	16	11
Organochlorine Pesticides Screening in Soil					
Aldrin	mg/kg dry wt	-	< 0.014	-	-
alpha-BHC	mg/kg dry wt	-	< 0.014	-	-
beta-BHC	mg/kg dry wt	-	< 0.014	-	-
delta-BHC	mg/kg dry wt	-	< 0.014	-	-
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.014	-	-
cis-Chlordane	mg/kg dry wt	-	< 0.014	-	-
trans-Chlordane	mg/kg dry wt	-	< 0.014	-	-
2,4'-DDD	mg/kg dry wt	-	< 0.014	-	-
4,4'-DDD	mg/kg dry wt	-	< 0.014	-	-
2,4'-DDE	mg/kg dry wt	-	< 0.014	-	-
4,4'-DDE	mg/kg dry wt	-	< 0.014	-	-
2,4'-DDT	mg/kg dry wt	-	< 0.014	-	-
4,4'-DDT	mg/kg dry wt	-	< 0.014	-	-
Total DDT Isomers	mg/kg dry wt	-	< 0.08	-	-
Dieldrin	mg/kg dry wt	-	< 0.014	-	-
Endosulfan I	mg/kg dry wt	-	< 0.014	-	-
Endosulfan II	mg/kg dry wt	-	< 0.014	-	-
Endosulfan sulphate	mg/kg dry wt	-	< 0.014	-	-
Endrin	mg/kg dry wt	-	< 0.014	-	-
Endrin aldehyde	mg/kg dry wt	-	< 0.014	-	-
Endrin ketone	mg/kg dry wt	-	< 0.014	-	-
Heptachlor	mg/kg dry wt	-	< 0.014	-	-
Heptachlor epoxide	mg/kg dry wt	-	< 0.014	-	-
Hexachlorobenzene	mg/kg dry wt	-	< 0.014	-	-
Methoxychlor	mg/kg dry wt	-	< 0.014	-	-

Summary of Methods

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

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-9
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required. US EPA 200.2 (modified), APHA 3125 B: Online Edition.	0.10 - 4 mg/kg dry wt	1-9
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	4, 7

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	4, 7

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

Testing was completed between 24-Nov-2025 and 25-Nov-2025. For completion dates of individual analyses please contact the laboratory.

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

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Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental

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Certificate of Analysis

Client:	BCD Group Limited	**Lab No:**	4031741	SPv1
Contact:	Amber Kouwenhoven	**Date Received:**	13-Nov-2025	
	C/- BCD Group Limited	**Date Reported:**	25-Nov-2025	
	PO Box 13276	**Quote No:**	113268	
	Tauranga Central	**Order No:**	23-1883	
	Tauranga 3141	**Client Reference:**	23-1883	
		Submitted By:	Sara Legler	

Sample Type: Soil

Sample Name:		HA1.1 13-Nov-2025 12:15 pm	HA1.2 13-Nov-2025 12:15 pm	HA1.3 13-Nov-2025 12:15 pm	HA2.1 13-Nov-2025 2:30 pm	HA2.2 13-Nov-2025 2:30 pm
Lab Number:		4031741.1	4031741.2	4031741.3	4031741.4	4031741.5
Individual Tests						
Dry Matter	g/100g as rcvd	71	-	-	-	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	6	4	2	8	6
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	6	5	4	13	7
Total Recoverable Copper	mg/kg dry wt	4	4	5	3	3
Total Recoverable Lead	mg/kg dry wt	11.9	10.4	10.2	14.8	17.4
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	0.24	< 0.10
Total Recoverable Nickel	mg/kg dry wt	3	3	3	6	2
Total Recoverable Zinc	mg/kg dry wt	22	21	23	41	12
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.014	-	-	-	-
alpha-BHC	mg/kg dry wt	< 0.014	-	-	-	-
beta-BHC	mg/kg dry wt	< 0.014	-	-	-	-
delta-BHC	mg/kg dry wt	< 0.014	-	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.014	-	-	-	-
cis-Chlordane	mg/kg dry wt	< 0.014	-	-	-	-
trans-Chlordane	mg/kg dry wt	< 0.014	-	-	-	-
2,4'-DDD	mg/kg dry wt	< 0.014	-	-	-	-
4,4'-DDD	mg/kg dry wt	< 0.014	-	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.014	-	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.014	-	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.014	-	-	-	-
4,4'-DDT	mg/kg dry wt	< 0.014	-	-	-	-
Total DDT Isomers	mg/kg dry wt	< 0.09	-	-	-	-
Dieldrin	mg/kg dry wt	< 0.014	-	-	-	-
Endosulfan I	mg/kg dry wt	< 0.014	-	-	-	-
Endosulfan II	mg/kg dry wt	< 0.014	-	-	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.014	-	-	-	-
Endrin	mg/kg dry wt	< 0.014	-	-	-	-
Endrin aldehyde	mg/kg dry wt	< 0.014	-	-	-	-
Endrin ketone	mg/kg dry wt	< 0.014	-	-	-	-
Heptachlor	mg/kg dry wt	< 0.014	-	-	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.014	-	-	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.014	-	-	-	-
Methoxychlor	mg/kg dry wt	< 0.014	-	-	-	-

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil					
Sample Name:		HA2.3 13-Nov-2025 2:30 pm	HA8.1 13-Nov-2025 4:00 pm	HA8.2 13-Nov-2025 4:00 pm	HA8.3 13-Nov-2025 4:00 pm
Lab Number:		4031741.6	4031741.7	4031741.8	4031741.9
Heavy Metals with Mercury, Screen Level					
Total Recoverable Arsenic	mg/kg dry wt	3	11	5	3
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.18	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	6	12	5	6
Total Recoverable Copper	mg/kg dry wt	3	13	3	3
Total Recoverable Lead	mg/kg dry wt	12.0	17.8	16.4	12.2
Total Recoverable Mercury	mg/kg dry wt	< 0.10	0.24	0.15	< 0.10
Total Recoverable Nickel	mg/kg dry wt	< 2	6	2	< 2
Total Recoverable Zinc	mg/kg dry wt	9	37	14	12

Summary of Methods

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

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-9
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required. US EPA 200.2 (modified), APHA 3125 B: Online Edition.	0.10 - 4 mg/kg dry wt	1-9
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	1
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1

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

Testing was completed between 21-Nov-2025 and 25-Nov-2025. For completion dates of individual analyses please contact the laboratory.

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

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Client Services Manager - Environmental

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Certificate of Analysis

Client:	BCD Group Limited	**Lab No:**	4032427	SPv1
Contact:	Amber Kouwenhoven	**Date Received:**	14-Nov-2025	
	C/- BCD Group Limited	**Date Reported:**	25-Nov-2025	
	PO Box 13276	**Quote No:**	113268	
	Tauranga Central	**Order No:**	23-1883	
	Tauranga 3141	**Client Reference:**	23-1883	
		Submitted By:	Sara Legler	

Sample Type: Soil

Sample Name:		HA 7.1 14-Nov-2025 2:30 pm	HA 7.2 14-Nov-2025 2:30 pm	HA 7.3 14-Nov-2025 2:30 pm	HA 14.1 14-Nov-2025 12:30 pm	HA 14.2 14-Nov-2025 12:30 pm
Lab Number:		4032427.1	4032427.2	4032427.3	4032427.4	4032427.5
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	-	78	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	7	< 2	4	6
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	7	10	5	6	7
Total Recoverable Copper	mg/kg dry wt	5	6	5	4	7
Total Recoverable Lead	mg/kg dry wt	11.6	7.1	7.1	10.9	10.4
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	0.13	0.10
Total Recoverable Nickel	mg/kg dry wt	3	5	< 2	2	4
Total Recoverable Zinc	mg/kg dry wt	17	23	17	17	19
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	-	< 0.013	-
alpha-BHC	mg/kg dry wt	-	-	-	< 0.013	-
beta-BHC	mg/kg dry wt	-	-	-	< 0.013	-
delta-BHC	mg/kg dry wt	-	-	-	< 0.013	-
gamma-BHC (Lindane)	mg/kg dry wt	-	-	-	< 0.013	-
cis-Chlordane	mg/kg dry wt	-	-	-	< 0.013	-
trans-Chlordane	mg/kg dry wt	-	-	-	< 0.013	-
2,4'-DDD	mg/kg dry wt	-	-	-	< 0.013	-
4,4'-DDD	mg/kg dry wt	-	-	-	< 0.013	-
2,4'-DDE	mg/kg dry wt	-	-	-	< 0.013	-
4,4'-DDE	mg/kg dry wt	-	-	-	< 0.013	-
2,4'-DDT	mg/kg dry wt	-	-	-	< 0.013	-
4,4'-DDT	mg/kg dry wt	-	-	-	< 0.013	-
Total DDT Isomers	mg/kg dry wt	-	-	-	< 0.08	-
Dieldrin	mg/kg dry wt	-	-	-	< 0.013	-
Endosulfan I	mg/kg dry wt	-	-	-	< 0.013	-
Endosulfan II	mg/kg dry wt	-	-	-	< 0.013	-
Endosulfan sulphate	mg/kg dry wt	-	-	-	< 0.013	-
Endrin	mg/kg dry wt	-	-	-	< 0.013	-
Endrin aldehyde	mg/kg dry wt	-	-	-	< 0.013	-
Endrin ketone	mg/kg dry wt	-	-	-	< 0.013	-
Heptachlor	mg/kg dry wt	-	-	-	< 0.013	-
Heptachlor epoxide	mg/kg dry wt	-	-	-	< 0.013	-
Hexachlorobenzene	mg/kg dry wt	-	-	-	< 0.013	-
Methoxychlor	mg/kg dry wt	-	-	-	< 0.013	-

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The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil						
Sample Name:		HA 14.3 14-Nov-2025 12:30 pm	HA 5.1 14-Nov-2025 1:15 pm	HA 5.2 14-Nov-2025 1:15 pm	HA 5.3 14-Nov-2025 1:15 pm	HA 6.1 14-Nov-2025 10:00 am
Lab Number:		4032427.6	4032427.7	4032427.8	4032427.9	4032427.10
Individual Tests						
Dry Matter	g/100g as rcvd	-	74	-	-	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	6	5	3	5
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	5	7	10	9	19
Total Recoverable Copper	mg/kg dry wt	6	7	8	6	30
Total Recoverable Lead	mg/kg dry wt	8.7	7.2	6.9	7.2	20
Total Recoverable Mercury	mg/kg dry wt	< 0.10	0.15	< 0.10	< 0.10	0.34
Total Recoverable Nickel	mg/kg dry wt	2	4	4	3	9
Total Recoverable Zinc	mg/kg dry wt	19	34	36	31	51
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	< 0.014	-	-	-
alpha-BHC	mg/kg dry wt	-	< 0.014	-	-	-
beta-BHC	mg/kg dry wt	-	< 0.014	-	-	-
delta-BHC	mg/kg dry wt	-	< 0.014	-	-	-
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.014	-	-	-
cis-Chlordane	mg/kg dry wt	-	< 0.014	-	-	-
trans-Chlordane	mg/kg dry wt	-	< 0.014	-	-	-
2,4'-DDD	mg/kg dry wt	-	< 0.014	-	-	-
4,4'-DDD	mg/kg dry wt	-	< 0.014	-	-	-
2,4'-DDE	mg/kg dry wt	-	< 0.014	-	-	-
4,4'-DDE	mg/kg dry wt	-	< 0.014	-	-	-
2,4'-DDT	mg/kg dry wt	-	< 0.014	-	-	-
4,4'-DDT	mg/kg dry wt	-	< 0.014	-	-	-
Total DDT Isomers	mg/kg dry wt	-	< 0.08	-	-	-
Dieldrin	mg/kg dry wt	-	< 0.014	-	-	-
Endosulfan I	mg/kg dry wt	-	< 0.014	-	-	-
Endosulfan II	mg/kg dry wt	-	< 0.014	-	-	-
Endosulfan sulphate	mg/kg dry wt	-	< 0.014	-	-	-
Endrin	mg/kg dry wt	-	< 0.014	-	-	-
Endrin aldehyde	mg/kg dry wt	-	< 0.014	-	-	-
Endrin ketone	mg/kg dry wt	-	< 0.014	-	-	-
Heptachlor	mg/kg dry wt	-	< 0.014	-	-	-
Heptachlor epoxide	mg/kg dry wt	-	< 0.014	-	-	-
Hexachlorobenzene	mg/kg dry wt	-	< 0.014	-	-	-
Methoxychlor	mg/kg dry wt	-	< 0.014	-	-	-

Sample Name:		HA 6.2 14-Nov-2025 10:00 am	HA 6.3 14-Nov-2025 10:00 am	HA 15.1 14-Nov-2025 11:00 am	HA 15.2 14-Nov-2025 11:00 am	HA 15.3 14-Nov-2025 11:00 am
Lab Number:		4032427.11	4032427.12	4032427.13	4032427.14	4032427.15
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	77	-	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	3	4	3	< 2
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	26	15	5	6	8
Total Recoverable Copper	mg/kg dry wt	52	70	6	5	4
Total Recoverable Lead	mg/kg dry wt	18.2	27	10.2	9.5	7.0
Total Recoverable Mercury	mg/kg dry wt	0.16	0.11	0.11	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	11	11	2	< 2	2
Total Recoverable Zinc	mg/kg dry wt	47	55	25	20	18
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	< 0.013	-	-
alpha-BHC	mg/kg dry wt	-	-	< 0.013	-	-

Sample Type: Soil						
Sample Name:		HA 6.2 14-Nov-2025 10:00 am	HA 6.3 14-Nov-2025 10:00 am	HA 15.1 14-Nov-2025 11:00 am	HA 15.2 14-Nov-2025 11:00 am	HA 15.3 14-Nov-2025 11:00 am
Lab Number:		4032427.11	4032427.12	4032427.13	4032427.14	4032427.15
Organochlorine Pesticides Screening in Soil						
beta-BHC	mg/kg dry wt	-	-	< 0.013	-	-
delta-BHC	mg/kg dry wt	-	-	< 0.013	-	-
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.013	-	-
cis-Chlordane	mg/kg dry wt	-	-	< 0.013	-	-
trans-Chlordane	mg/kg dry wt	-	-	< 0.013	-	-
2,4'-DDD	mg/kg dry wt	-	-	< 0.013	-	-
4,4'-DDD	mg/kg dry wt	-	-	< 0.013	-	-
2,4'-DDE	mg/kg dry wt	-	-	< 0.013	-	-
4,4'-DDE	mg/kg dry wt	-	-	< 0.013	-	-
2,4'-DDT	mg/kg dry wt	-	-	< 0.013	-	-
4,4'-DDT	mg/kg dry wt	-	-	< 0.013	-	-
Total DDT Isomers	mg/kg dry wt	-	-	< 0.08	-	-
Dieldrin	mg/kg dry wt	-	-	< 0.013	-	-
Endosulfan I	mg/kg dry wt	-	-	< 0.013	-	-
Endosulfan II	mg/kg dry wt	-	-	< 0.013	-	-
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.013	-	-
Endrin	mg/kg dry wt	-	-	< 0.013	-	-
Endrin aldehyde	mg/kg dry wt	-	-	< 0.013	-	-
Endrin ketone	mg/kg dry wt	-	-	< 0.013	-	-
Heptachlor	mg/kg dry wt	-	-	< 0.013	-	-
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.013	-	-
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.013	-	-
Methoxychlor	mg/kg dry wt	-	-	< 0.013	-	-

Summary of Methods

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

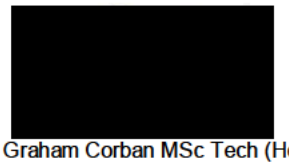
Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1-15
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required. US EPA 200.2 (modified), APHA 3125 B: Online Edition.	0.10 - 4 mg/kg dry wt	1-15
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	4, 7, 13
Dry Matter	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	4, 7, 13

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

Testing was completed between 24-Nov-2025 and 25-Nov-2025. For completion dates of individual analyses please contact the laboratory.

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

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



Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental

Appendix J HAIL locations







HAIL ID	Activity description
01	Farm dump located in Paddock 36 of the Duncan property
02	Storage shed and fuel tanks
03	Vehicle shed
04	Offal pit
05	Offal pit
06	Offal pit
07	Fuel storage tanks
08	Burn pile

Client: WTR WAIKATO THOROUGHBRED RACING TE HAPA - CAMBRIDGE - WAIPA

Contractor:

BCD GROUP

Sheet: HAIL Locations

Project Title: Waikato Thoroughbred Racing
Pencarrow, Hooker & Duncan Roads

Revision	Date	By	Reason
01	27/02/2026	BB	Fast Track Referral Application

Drawn: SL
Engineer: SL
SCALE: 1000
At: A3
Job Number: 23-1883
Sheet Number:
Revision: 01

All dimensions to be verified on site before making any shop drawings or commencing any work

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