

Genetic Technologies Ltd/
Philip Yates Family Holdings Ltd
PO Box 105303
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05 August 2021

Attention: Guy Rodgers / Jason Morris

Dear Guy and Jason

Contaminated Land Summary - Yates-Genetics Rukuhia Property, 3463 Ohaupo Road

Beca Limited (Beca) have been commissioned by Philip Yates Family Holdings Limited (Yates) to provide supporting documentation to inform a Plan Change in relation to contaminated land assessments for their 3463 Ohaupo Road property, Rukuhia, Waikato (**Figure 1**).

A number of existing contaminated land investigations, reports and management plans have been prepared for areas within the property that were investigated for contaminated soils associated with the change from the previous land use of a research orchard prior to 2012. This report provides a summary of these historical reports in order to consolidate all contaminated land information for the property, enabling reporting for the Plan Change and to inform future considerations with respect to contaminated land assessment and management.



Figure 1. 3463 Ohaupo Road property location and extent (source: Waipa District Council GIS)

Our understanding of the Plan Change proposal is that the ~29ha block as identified above, owned by Phillip Yates Family holding Limited, is currently zoned Rural (with an existing live consent for a rural industry development) and will potentially be rezoned as commercial/industrial alongside other adjacent developments by Titanium Park Limited. The scope of this report is limited solely to the Yates property.

1 Existing Reports Summary

A number of existing packages of work have been undertaken to assess the soil contamination status for the property. These packages of work were undertaken for different purposes between 2011 – 2015. The following sections provide a summary of each report prepared (in chronological order), highlighting the main findings.

All reports listed below can be provided on request.

1.1 Report 1 - Genetics Waikato Contaminated Land Assessment (January 2012)

Beca undertook a contaminated soils assessment of the southern 8ha of site within the 29ha property associated with the proposed development of a Research Hub under a resource consent. The contamination assessment involved a desktop review of information held on the site which identified existing horticultural use and pesticide research trials.

This investigation included the collection of 80 soil samples from throughout the horticultural site and composite analysis for heavy metals and organochlorine pesticides. No samples were collected in areas outside the Research Hub development or in the vicinity of the implement sheds onsite.

The assessment identified concentrations of arsenic and cadmium in shallow soils that exceeded an adjusted National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCSC) criteria for a residential land use scenario. This assessment criteria was adjusted at the time to align with the procedures of the New Zealand Contaminated Land Management Guidelines when assessing composite samples.

This report concluded the development would require consent under the NESCSC and recommended the preparation of a Contaminated Soils Management Plan. This assessment did note that the development was at the time on hold, pending an outcome in relation the New Zealand Transport Agency's (NZTA, now Waka Kotahi) Southern Links Project. It was also noted that an underground storage tank (UST) was located onsite that was not included in this assessment, with a recommendation for the UST to be assessed at a later date.

1.2 Report 2 - Preliminary Site Investigation and Detailed Site Investigation – Genetics Waikato Greenfield Study (November 2012)

Beca undertook a Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI), combined into one report, for the property. The PSI component covered the entire 29ha property, whereas the DSI component (further sampling and analysis) focused on the area associated with the Research Hub development. This report built upon the findings of Report 1 and includes the change in assessment criteria from 'residential' to 'commercial/industrial' upon the confirmation of design for the intended Research Hub development and includes a desktop assessment of the remaining site that was not covered in Report 1.

Additional investigation locations were undertaken throughout the implement shed area that was not covered in Report 1 which were identified as areas as potentially being contaminated by site operations. This investigation involved the collection and analysis of soil samples collected from excavated test pits

throughout this implement shed area, as well as supplementary hand auger locations covering areas of horticultural use that were not covered in Report 1.

This report concluded that two composite samples within horticultural areas exceeded relevant NESCS human health risk criteria and the development would require consent under the NESCS and a Contaminated Soils Management Plan. No additional contaminants presenting a risk were identified around the implement shed area. Multiple soil samples exceeded regional environmental discharge criteria for heavy metals that would require management during earthworks.

1.3 Report 3 - Addendum to Preliminary Site Investigation – Genetics Waikato Greenfield Study (October 2013)

Beca prepared an addendum to Report 2 to address a further information request from Waipa District Council regarding the assessment of the identified underground storage tank (UST) in accordance with the Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Site in New Zealand ('NZ Petroleum Guidelines').

This addendum identified the UST as a 3,400 litre tank, buried approximately 500mm below ground level (bgl) with an associated bowser and pipework connection. The UST had previously contained diesel for onsite equipment.

It was reported in this addendum that the investigation, reporting and management of this UST will be reported independently as the UST was planned to be removed at a later stage of the project.

1.4 Report 4 - Letter to Waipa District Council: Re: Consent Number LU/0112/13 – 3463 Ohaupo Road (September 2014)

Beca prepared a letter to Waipa District Council regarding further delineation sampling undertaken on the site in the vicinity of the contaminant exceedances identified in both Report 1 and Report 2. Contaminant exceedances in Report 1 and Report 2 were based on an adjusted guideline value based on the composite sampling undertaken. Subsequently, individual analysis of soil samples in these areas would provide better representation of the contamination present to inform risk assessment and management required.

Additional sampling was undertaken in the vicinity of the existing composite samples which exceeded the adjusted human health criteria for a commercial/industrial land use. Individual soil sample analysis in these areas showed concentrations of heavy metal contamination not exceeding relevant human health risk criteria. It was concluded in this letter that the site did not contain concentrations of contaminants in soil elevated above applicable guideline values for commercial/industrial land use.

It was recommended in this letter that the consent conditions associated with the development requiring a Remediation Action Plan (RAP) and Site Validation Report (SVR) will now not be required and that a Contaminated Soils Management Plan (CSMP) would better represent the management required for working the site's soils.

1.5 Report 5 - Underground Petroleum Storage System Removal – 3463 Ohaupo Road, Hamilton (September 2014)

The UST (aka. underground petroleum storage system, UPSS) previously identified and discussed in Report 1, Report 2 and Report 3 was investigated during its removal on 1 July 2014. This report presented the findings of the UST's decommissioning and removal.

The 3400 l UST, measuring 3.5m by 1.5m, was positioned under a 100mm concrete slab and buried approximately 500mm bgl. The tank and bowser pipe network was excavated and removed from site by the appointed tank removalist with an excavation pit down to 2.7m below ground level remaining to enable soil sample collection and validation.

No visible or olfactory signs of hydrocarbon contamination were present during the UST's removal. Use of a photoionisation detector (PID) during the excavation and surrounding site soils did not identify any potential hydrocarbon impacted soils. Groundwater was not intercepted in the 2.7m deep excavation.

A total of 18 soil samples were collected from around the UST pit, including the base of where the UST was positioned and the excavated pit walls, as well as samples from beneath the pipe network leading to the bowser.

Soil analysis confirmed that no soil samples exceeded the adopted Tier 1 soil acceptance criteria from the NZ Petroleum Guidelines for total petroleum hydrocarbons and BTEX (benzene, toluene, ethylbenzene and xylene). Additionally, no soil samples exceeded the NESCS heavy metal human health risk criteria for a commercial/industrial land use scenario.

It was concluded that there is no risk remaining to nearby ecological receptors or future site users from hydrocarbon residues in soil in the vicinity of the removed UST.

1.6 Report 6 - Letter to Genetic Technologies: Contaminated Land Investigations – Genetic Technologies, Hamilton (September 2014)

Beca prepared a letter for Genetic Technologies summarising the recent soil investigations undertaken (included in Report 4) with the purpose of providing an interpretation and assessment of the results in relation to the requirements of a discharge consent from Waikato Regional Council (WRC).

It was concluded that arsenic contamination identified in the previous investigations is above environmental discharge risk guideline values and is considered representative of the broad application of pesticides resulting in arsenic contamination across the site. It was considered likely that a discharge consent for earthworks on this site would be required from WRC and supporting documentation, in the form of a Contaminated Soils Management Plan, was recommended.

1.7 Report 7 - Contaminated Soils Management Plan – Genetic Technologies, Ohaupo Rd, Hamilton (March 2015)

Beca prepared a Contaminated Soils Management Plan (CSMP) for Genetic Technologies to satisfy a condition of their land use consent (LU/0112/13) for earthworks within this site. This CSMP was prepared on the basis of the findings detailed in the aforementioned reports, predominantly relating to the arsenic contamination identified in shallow soils presenting an environmental discharge risk, as well as additional elevated heavy metal concentrations above background levels throughout the site.

The CSMP provides management procedures for stormwater and sediment control, dust control, stockpiling, offsite disposal and unexpected discovery protocol.

2 Supplementary Desktop Assessment 2015 – 2021

A supplementary desktop assessment has been undertaken to assess the land use operating onsite between the existing investigations till present (i.e. between 2013 – 2021). This assessment includes a review of historical aerials over this time as well as information provided by the site owner, Mr Will Yates,

and Yates Holdings Representative, Mr Jason Morris, regarding activities that have been undertaken. This assessment provides an indication as to whether any potential contaminating activities not detailed in the existing investigations have occurred onsite over this period that may require further investigation in the future.

2.1 Client Provided Information

Work completed onsite since circa 2013 include:

- In 2014 clearance of the existing orchard infrastructure was undertaken including removal of redundant buildings, vegetation clearance through orchard areas including shelterbelts and minor earthworks. The site was then sown in maize. Materials associated with the vegetation clearance have been chipped and retained onsite as a mulch and weed suppressant for landscape planting.
- No orchard activities have been undertaken onsite since the removal of the orchard crops in 2014.
- Undergrounding of the powerlines running along the Ohaupo Road boundary.
- Clearance and decommissioning (filling) of the existing water storage pond located near the centre of the site (identified in historical aerials). We understand that this was infilled using the available materials in the above ground embankments and some imported clean fill material from a sand quarry on Airport Road. While this is notably unconsolidated fill which may impact the suitability for development, from the information provided it is considered relatively low risk from a contamination perspective.
- Construction of a new implement shed near the existing implement shed and laydown area, utilising an existing concrete pad from previous operations (formerly a small cool store). This new shed has been used for storing equipment and bagged maize seed. The project involved minor earthworks to extend the concrete pad and install a stormwater drainage system. No soils with visual signs of possible contamination or redundant orchard materials were encountered during the works.
- Construction of a new wash down pad for site machinery adjacent the new shed.
- Perimeter landscape planting has been undertaken along the frontage of Ohaupo Road and Middle Road, as well as portions of the southern boundary with the Hamilton Airport property. Areas surrounding drainage channels in the northern part of the site have also been landscaped.
- Extension of the internal gravel road and widening of entrance points off Ohaupo Road and Middle Road to facility vehicle movements throughout the site.
- Maize cropping across the majority of the site, including:
 - 21ha of maize for commercial sale, managed by an external agricultural contractor for planting and harvesting of the crops.
 - 2ha of maize trial plots assessing hybrid variety performance and tillage systems. These trial plots do not assess chemical sprays and relate to growth and seed production of the various new maize hybrids.
- No large-scale development as initially anticipated by the resource consent has been completed to date, understood to be due to market constraints and potentially the removal of processing equipment associated with the raw maize due to viability.

2.2 Aerial Photography Review

Historical aerials sourced from Google Earth have been reviewed to identify any significant changes to land uses and activities that may present a contamination risk not previously identified. These aerials are provided as **Attachment A** to this report.

- January 2013 – The entire site appears to be used for mixed horticultural purposes with what appears to be different types of produce planted in rows (identified in the previous assessments as including apples, berries, chestnuts, kiwifruit and potatoes). Surrounding land use is predominantly agricultural with some cropping bordering the site.
- July 2014 – Clearance operations of the site are underway, with multiple blocks of vegetation throughout the site being cleared and chipped. Several blocks of horticulture remain. No changes have occurred to surrounding land uses.
- October 2014 – The entire site has now been cleared with only the implement shed area remaining and a small grove of chestnut trees in the western corner bordering Ohaupo Road. Several stockpiles of what appear to be vegetation chip/mulch remain onsite. A linear pattern across the paddocks appears to reflect the statement that the site was seeded in maize immediately after the vegetation clearance. The water storage pond near the centre of the site also appears to be getting filled in. No changes have occurred to surrounding land uses.
- December 2015 – The entire site appears to be maize cropping. A new shed has now been built adjacent the existing implement shed area, reflecting the statement provided by Mr Yates above. The water storage pond still remains. No changes have occurred to surrounding land uses.
- March 2017 – No changes have occurred to the majority of the site used for maize cropping. The irrigation water storage pond has now been backfilled and is now cropped like the rest of the site. Landscape planting has occurred along the boundary of Ohaupo Road. No changes have occurred to surrounding land uses.
- January 2021 - No significant changes have occurred to site operations or surrounding land uses.

3 Summary of Site Contamination Information

The property has had a number of investigations undertaken between 2011 - 2015. A PSI was undertaken for the entire property, covering the full extent of the site. Various soil sampling assessments have been restricted to the footprint of the proposed Research Hub in the southern half of the site (**Figure 2**).

The PSI identified the entire property as potentially being influenced by historical contaminating activities, namely horticultural use and pesticide application associated with the existing research facility and orchard activities. This land use is registered on the Ministry for the Environment's Hazardous Activity and Industry List (HAIL) as:

- A10: Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds.

The HAIL classification will remain on the subject property as a record of the former land use with each development adding further information as to the risk of contamination through any subsequent PSI or DSI produced.

Additional to this above HAIL was the potential hydrocarbon contamination associated with a UST identified near the implement shed and laydown area. An assessment of this UST was undertaken during its removal (Report 5) which concluded that there is no residual soil contamination risk remaining to nearby ecological receptors or future site users from hydrocarbons in the vicinity of the removed UST.



**Figure 2. Extent of PSI and DSI (including supplementary) investigations
(base image source: Google Earth)**

A series of soil investigations undertaken throughout the southern half of the site identified only a low human health risk present. Concentrations of various heavy metals were recorded above regional background levels and detectable concentrations of OCP compounds (albeit below relevant risk assessment criteria) reflect the site soils have been marginally impacted by historical horticultural and pesticide trails. Concentrations of arsenic were recorded within the historical orchard areas above environmental discharge criteria and therefore present a potential risk to ecological receptors during earthwork activities. No soil contamination was identified in the vicinity of the implement sheds and laydown areas presenting an elevated risk above that identified throughout the orchard areas.

A Contaminated Soils Management Plan (CSMP) was prepared to facilitate works onsite associated with the proposed Research Hub development. This CSMP outlined soil handling and management procedures associated with soil disturbance within the site to appropriately manage the environmental discharge risk identified.

4 Conclusions and Recommendations

It is likely soil contamination identified in the investigations summarised in this report are reflective of the contaminant levels throughout the wider property, namely low levels of heavy metals potentially presenting an environmental discharge risk and low-level detections of residual pesticide compounds. This consideration is based on the uniform application of pesticides across the majority of the site, resulting in similar residual contaminant levels in soil.

The land use subsequent to the sampling being undertaken has been annual cropping of maize requiring deep tilling of the soils (up to 400mm bgl) by agricultural machinery. This practice allows for a degree of soil mixing within the upper soils and integration of organic material (maize stubble and grasses which are hoed into the soils). These aspects are in line with management techniques for soils that have been exposed to historic pesticide applications, particularly in relation to residual arsenic and copper in soils, although no further testing of the soils has been undertaken to assess changes in concentration levels to date. Landscaping and grassed maintenance access tracks have been maintained around waterways in the northern part of the site providing a buffer to the watercourses. The CSMP has been adopted in relation to earthworks associated with the current site operations.

Given that no sampling has taken place in the northern area of the site, the contamination status of these soils is unknown. We note that the intensity of horticultural use in this northern part of the site was less than the southern portion due to wetness limitations during the winter months, as observed in aerial photography reviews. However, in the absence of soil sampling it cannot be concluded that there is no human health risk present to construction workers or future site users associated with the development of this land.

Subsequently, it is recommended that any future development in the northern half of the site (where no soil sampling has been undertaken) have a soil assessment undertaken to determine the potential soil contamination risk to construction workers, future site works and the environment, specifically relating to the future site's development and intended land use, whilst also informing the consenting status under the NESCS and Waikato Regional Plan.

Any development of the southern half of the site, which has previously been covered by the existing soil sampling and assessments summarised in this report, will require a review on a case-by-case basis to appropriately inform any future project or development, aligned with the intended land use.

For the purposes of the Plan Change application, the site is understood to be rezoned to a commercial/industrial land use, as opposed to the current rural/commercial land use zone. The intended future developments within this property are therefore likely to involve earthworks to construct largely impervious commercial lots with large building and hard stand area coverage associated with each individual development. Whilst this cannot be confirmed at this stage, these developments will likely present a further barrier to potential soil contaminant exposure to future site users and contaminant discharge risk given their impervious nature.

The management protocol detailed in the CSMP, in particular management of potential sediment discharges during earthworks, will appropriately manage the ecological discharge risk identified throughout the site during construction. Future developments within the site will have independent soil contaminant assessments undertaken to inform resource consenting requirements which will appropriately identify any potential risk in areas not assessed and confirm the consenting and management approach.

From the assessments undertaken to date, there is a good understanding of the historic use of the site and detailed investigations for the southern portion of the site indicate that the risk of soil contaminant exposure on human health is low. There is no obvious limitation with respect to contaminated soils that would

prevent the future development of the property in line with the existing resource consents held or as a result of the proposed rezoning in the future. Further investigations may be necessary to inform specific developments once the intended land use and development earthworks are understood.

I trust that this summary of the contaminated soil investigations for the Yates property provides sufficient context and indication of the contaminated land reporting to date to enable consideration of the Private Plan Change.

Yours sincerely



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on behalf of

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Attachments:
Historical Aerial Photography



Google Earth

Image © 2021 Maxar Technologies

January 2013



Google Earth

Image © 2021 Maxar Technologies

July 2014



Google Earth

Image © 2021 Maxar Technologies

October 2014



Google Earth

Image © 2021 Maxar Technologies

December 2015



Google Earth

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March 2017



Google Earth

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