

APPENDIX G – PRELIMINARY SITE INVESTIGATION

Preliminary Site Investigation (Contamination)

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31 January 2019

VERSION 1

State Highway 16 Brigham Creek to Waimauku Safety Improvements Project Stage 1
and Stage 2

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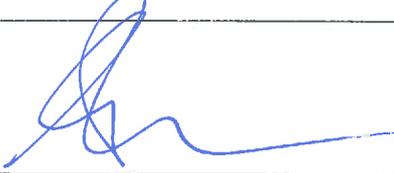
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EXECUTIVE SUMMARY

Land disturbance activities are proposed for a section of State Highway 16 (SH16), between Brigham Creek and Waimauku for works being undertaken to improve road and roadside safety. A Preliminary Site Investigation (PSI) is required in order to identify land either within or adjacent to the project area that has the potential to be contaminated as a result of current or historical land use activities.

The project area extends from the end of the Auckland North-Western Motorway at the intersection (roundabout) of SH16, Brigham Creek Road and Fred Taylor Drive (Route Station/ Route Position (RS/RP) 016-0019/0.000) through to the posted speed limit change (70km/hr) east of Waimauku (016-0019/9.892). The current design of the proposed works is subject to small changes through detailed design, however it is likely to include shoulder widening, barrier improvements, alterations to existing driveways and intersections and stormwater upgrades. The majority of the project area is within the current designated roadway, with neighbouring properties utilised for an array of residential, commercial and rural land use activities, most notably horticultural activities.

This PSI involved the review of historical aerial photography from 1940 to 2017 and publicly available information provided by Auckland Council including discharge consents. A site drive-by of the alignment was also undertaken. The information review identified several potentially contaminated sites included within and along the bounds of the project area. These properties are associated with the following Hazardous Activities and Industries List (HAIL) activities:

- HAIL A10 – Persistent pesticide application (horticultural setting):
 - 218-220 SH16, 6 Joyce Adams Place, 529-751 SH16, 32 Meryl Avenue, 307 Matua Road, 726 SH16, 482 SH16, 465 SH16, 191 SH16, 8 Kennedys Road, 291 and 299 SH16, 331 SH16 / 1368 Coatesville- Riverhead Highway, 393-451 SH16, 464 SH16, 300-455 SH16, 505 SH16 and 550 SH16.
- HAIL A13 – Wiri to Marsden liquid fuel transmission line (under SH16)
 - Near 733 SH16

An assessment of the above sites against the proposed design has been undertaken and identified 13 sites as properties considered to be within areas intercepted by project works involving small scale regrading of earth to provide suitable batters to the new alignment.

It was impractical to undertake intrusive investigation in the form of a Detailed Site Investigation (DSI) at the time of drafting this PSI due to the earthworks plan being subject to minor changes through detailed design and obtaining site access. Earthworks within each identified HAIL alongside the improvement works are highly unlikely to exceed the Permitted Activity (PA) criteria under Regulation 8(3) of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS) for the disturbance and disposal of soil on a case-by-case or 'piece of land' basis given the small work areas adjacent to the road corridor within each HAIL. However, the anticipated timeframe of works will likely exceed the 2-month threshold outlined in Regulation 8(3) of the NESCS and therefore works will not meet the PA criteria.

It is recommended a conservative discretionary activity consent is applied for under the NESCS with the provision of this PSI and a Contaminated Soils Management Plan (CSMP) as no intrusive sampling (and assessment in the form of a DSI) has been undertaken.

The CSMP will effectively manage and mitigate any risks posed to those on site by the potential contamination present.

Soil analysis is to be conducted on the proposed disturbance areas of neighbouring HAIL sites as required to assist in providing information to disposal site operators and the leading contractor. This sampling will be confirmed when a contractor is involved and detailed design is concluded.

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1. INTRODUCTION

The Safe Roads Alliance (SRA) has undertaken a Preliminary Site Investigation (PSI) for a section of State Highway 16 (SH16), between Brigham Creek and Waimauku. This PSI is required for work being undertaken to improve road and roadside safety to the State Highway Network.

1.1 Background

The SRA project is designed to construct and improve safety measures to the State Highway Network with the aim to create a more forgiving transport system, helping to reduce the occurrence of crashes causing death and serious injury. The majority of land where proposed works will be undertaken are within the designation of the highway.

The SH16 Safety Improvements Project (the Project) extends from the Brigham Creek Road roundabout south-west of Whenuapai to Factory Road, Waimauku, excluding the area of road between Kumeu and Huapai. The approximate length of the project is 10.2 km.

1.2 Purpose and Scope

The purpose of the desk study was the following:

- Identify, based on reviewed records, areas of land either within or adjacent to the proposed works areas that have the potential to be contaminated as a result of current or historical activities, and that have the potential to impact the areas of works.
- Comment on the contaminated land consent requirement for the proposed works under the following legislation: Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).

The scope of works included a desk-based review of historical background information. The following information sources were reviewed:

- Selected Auckland Council (AC) property files;
- AC Contaminated Site Enquiry Map;
- Historical aerial photographs from the AC GIS viewer and Retrolens; and
- A drive along the length of the alignment.

This assessment has been undertaken and reported in general accordance with the Ministry for the Environment (MfE) Contaminated Land Management Guidelines No. 1 – Reporting on Contaminated Sites in New Zealand (2011) and MfE Contaminated Land Management Guidelines No. 5 – Site Investigation and Analysis (2011).

2. SITE DESCRIPTION

2.1 Site Location and Area

The SH16 Brigham Creek to Waimauku extends from the end of the Auckland North-Western Motorway at the intersection (roundabout) of SH16, Brigham Creek Road and Fred Taylor Drive (Route Station/ Route Position (RS/RP) 016-0019/0.000) through to the posted speed limit change (70km/hr) east of Waimauku (016-0019/9.892).

The corridor is divided into five sections, as follows and highlighted in **Figure 1** below:

- **Section A:** Brigham Creek roundabout through to Coatesville-Riverhead Highway intersection;
- **Section B:** Coatesville-Riverhead Highway intersection;
- **Section C:** Coatesville-Riverhead Highway intersection through to Taupaki Road / Old North Rd intersection;
- **Section D:** Taupaki Road / Old North Road intersection through to the posted speed limit change (80km/h and 60km/h) east of Old Railway Road intersection, Kumeu; and
- **Section E:** From Station Road intersection, Huapai to the posted limit change (100 km/h and 70km/h) east of Wintour Road, Waimauku.

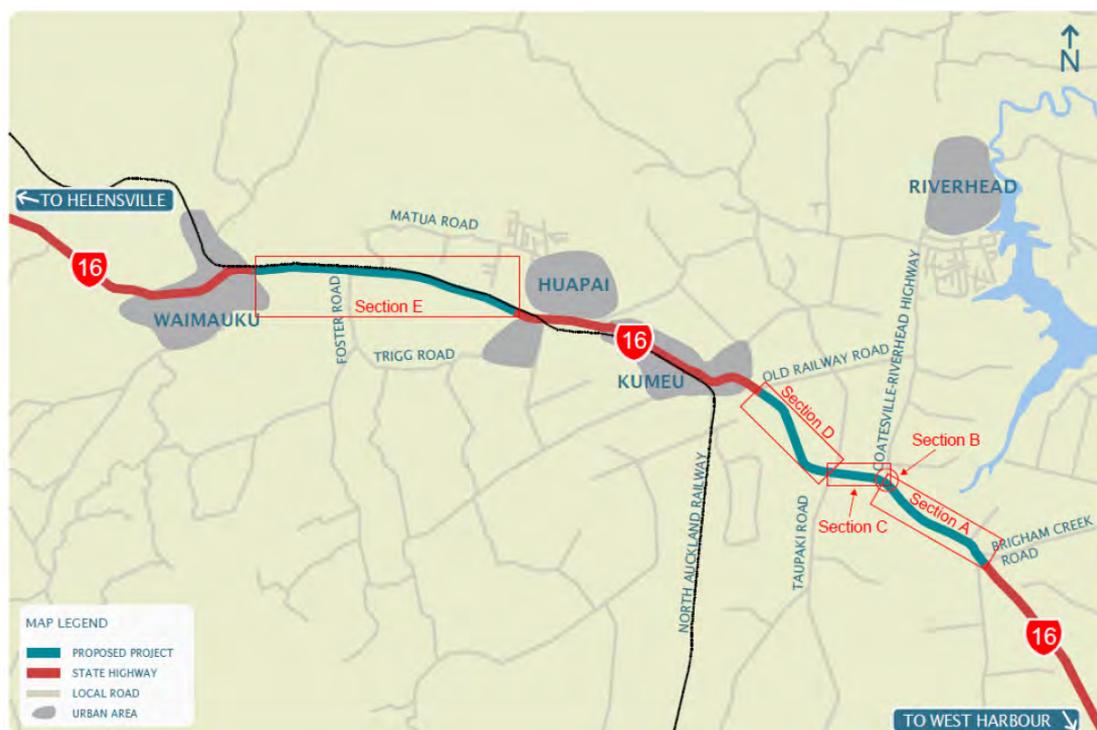


Figure 1: The SH16 Brigham Creek to Waimauku Project area.

The highway runs through land utilised for an array of land use activities including; rural residential, residential, agricultural/ horticultural purposes and industrial/ commercial activities.

2.2 Proposed Works

This portion of SH16 has been earmarked as a key location for servicing growth areas and responding to future urban transport demands. The proposed works involve shoulder widening and barrier improvements within the immediate border of the existing road.

The following works are proposed for each section of the corridor, with the most up to date plans included in **Appendix A**. Please note that the proposed works as presented in this PSI may be subject to minor changes through detailed design.

- **Section A** (Brigham Creek roundabout through to Coatesville-Riverhead Highway intersection) – provide two lanes in each direction with median safety barrier and behind the road shoulders;
- **Section B** (Coatesville-Riverhead Highway intersection) – convert the existing priority-controlled intersection to a roundabout with consideration to safe accesses to adjoining residential and commercial properties;
- **Section C** (Coatesville-Riverhead Highway intersection through to Taupaki Road / Old North Rd intersection) – provide two lanes in each direction with median safety barriers and behind the road shoulders;
- **Section D** (Taupaki Road / Old North Road intersection through to the posted speed limit change (80km/h and 60km/h) east of Old Railway Road intersection, Kumeu) – provide flush median markings; and
- **Section E** (from Station Road intersection, Huapai to the posted limit change (100 km/h and 70km/h) east of Wintour Road, Waimauku) - provide median safety barrier and behind the road shoulders with safe turnaround facilities.

Involved in the roading improvements is the installation of stormwater infrastructure in certain areas of the alignment. These installations involve the construction of catch pits along the side of the road corridor and piping to various outlets. All stormwater pipe installations are within the road corridor designation.

The total volume of earthworks cut is ~10,517m³, of which, where geotechnically suitable, will be reused onsite with an ~9,576m³ of fill required for the design. All earthworks are in the immediate shoulder of the current alignment, with works required to provide suitable batter slopes on both sides of the alignment. Work outside of the designation is limited to shallow topsoil stripping in areas to provide suitable batters to neighbouring properties.

3. ENVIRONMENTAL SETTING

3.1 Surrounding Land Use

The surrounding land use of **Section A** (Brigham Creek roundabout through to Coatesville-Riverhead Highway intersection) is largely rural residential and lifestyle blocks. Much of the rural land is being utilised for agricultural and/or horticultural purposes with various greenhouses present. Located some distance back from the road (approximately 150m) at 193 SH16 is what appears to be a fill site.

Located at **Section B** (Coatesville-Riverhead Highway intersection) is the Boric Food Market, Blossom Café and Borric Orchards. Horticultural activities make up the majority of this section.

The surrounding land along **Section C** (Coatesville-Riverhead Highway intersection through to Taupaki Road / Old North Rd intersection) again consists of horticultural activities. The Soljans Estate Winery is located at 366 SH16.

Again, **Section D** (Taupaki Road / Old North Road intersection through to east of Old Railway Road intersection, Kumeu) is largely rural residential and lifestyle blocks. Phil Grieg Strawberry Gardens is located at 464 SH16, with Building Blocks Childcare and Preschool located at 491 SH16. Juicy New Zealand Strawberries is located adjacent to Building Blocks and Kumeu Village Rest Home further down the road. A BP service station is located opposite the Old Railway Road intersection.

Section E (from Station Road intersection, Huapai to the posted limit change (100 km/h and 70km/h) east of Wintour Road, Waimauku) is largely horticultural in nature, with rural residential and lifestyle blocks also present. Several greenhouses and structures are present throughout this area. Points of interest within **Section E** include Coopers Creek Vineyard (601 SH16) and The Tasting Shed (609 SH16).

3.2 Topography

In general, the topography of the site appears to be largely flat. There are several gully systems present in the surrounding land, typically forming an undulating topography.

3.3 Geology and Hydrogeology

Published information¹ for the underlying geology of the project area is recorded as being the Puketoka Formation and consists of pumiceous mud, sand and gravel with muddy peat and lignite: rhyolite pumice, including non-welded ignimbrite, tephra and alluvia. This is largely consistent across the project area.

3.4 Sensitive Environmental Receptors

Brigham Creek is located approximately 600m up-road (easterly direction) of the Brigham Creek roundabout. Brigham Creek ultimately leads into the Waitemata Harbour. Several tributaries flow from Brigham Creek, these include; Ngongetepara Stream, Maimuka Stream, Karure Stream and Totara Inlet.

¹ Heron D. W. (custodian) 2014. Geological Map of New Zealand 1:250 000. Institute of Geological and Nuclear Sciences.

The Kumeu River is also a prominent River in the project area and crosses through SH16 near the Old Railway Road intersection. The Ahukuramu Stream flows from the Kumeu River, featuring in **Section E** of the project area.

4. INFORMATION SEARCH

4.1 Historical Aerial Photographs

Historical aerial photographs for the site have been sourced from Retrolens for the years 1940, 1950, 1961, 1972, 1988 and Auckland Council GeoMaps for the years 1999 and 2010-2011. The aerial photographs have been reviewed to identify any changes in land use activities on the site and surrounding properties, with the following observations made.

Historical aerial images are provided in **Appendix B**.

Table 1: Historical Aerial Photography Review

Year	Observations
1940	<ul style="list-style-type: none"> Some form of cropping/horticultural activities are present to the south of the Brigham Creek roundabout. From Brigham Creek to Kumeu the land use is largely rural, with several large agricultural production units present and various residential dwellings. SH16 is already fully established. At Kumeu the railway line begins to run parallel with SH16 and will continue to do so beyond the project area. Several structures are present along the road boundary, these appear to be smaller residential dwellings or sheds. The Huapai Railway Station is well established. From Huapai to Waimauku, largely to the south of the road boundary, several large horticultural lots are present. Based on the imagery, these are likely kiwifruit orchards. Several structures are present throughout this area, likely associated with the horticultural activities i.e. sheds and greenhouses. Waimauku is also considered rural in nature, with largely pastoral lots surrounding SH16.
1950	<ul style="list-style-type: none"> From Brigham Creek to Kumeu no significant change has occurred. Upon entering Kumeu, several small cropping/ horticultural lots are present. Several, likely residential structures remain along the roadside in Kumeu. The area of land between Huapai and Waimauku remains in use for horticultural purposes, these activities appear to have intensified in scale. The project area in Waimauku remains largely unchanged.
1961	<ul style="list-style-type: none"> The cropping/ horticultural activities south of the Brigham Creek roundabout are minimising in intensity. However, beyond the residential lots on the east of the Brigham Creek roundabout, another horticultural lot is present. Cropping activities and some small horticultural lots have been introduced along the northern road boundary between Brigham Creek and Kumeu. The activities appear to be moderately intensive. Several buildings remain along the road boundary at Kumeu, these appear to be industrial in nature. No significant changes have occurred through Huapai although there is an increase in the residential dwellings and associated structures present. The area of land between Huapai and Waimauku remains in use for horticultural purposes. In amongst the smaller buildings present along the road boundary appear to be several greenhouses. The project area in Waimauku remains largely unchanged.
1972	<ul style="list-style-type: none"> No significant changes are present. The cropping/ horticultural activities present between Brigham Creek and Kumeu appear to have intensified in nature. Land clearance appears to have occurred at two sites adjacent to Huapai Railway Station. The topography appears to have been severely altered, it is unclear for what purpose.

Year	Observations
	<ul style="list-style-type: none"> No further changes of significance are noted within the project area.
1988	<ul style="list-style-type: none"> Kiwifruit orchards appear to be fully established in the majority of the land surrounding the Brigham Creek roundabout. Cropping/horticultural activities have expanded to the south of the road boundary between Brigham Creek and Kumeu. In general, the land use activities in this area appear to be moderately intensive. Several structures, including greenhouses are present here. Between Kumeu and Huapai, the land use appears to have intensified. The majority of the properties here appear to be utilised for commercial/ industrial and some residential purposes. No further changes of significance are noted within the project area.
1999	<ul style="list-style-type: none"> Approximately 500m up road of the Brigham Creek roundabout a large area of soil disturbance is occurring. Again, horticultural activities dominate the area. Residential growth appears to have occurred in the areas surrounding Huapai. Several greenhouses are present on the outskirts of Waimauku. No further changes of significance are noted within the project area.
2010-2011	<ul style="list-style-type: none"> Development on the Brigham Creek roundabout has commenced and appears to be almost, if not complete. The location where the soil disturbance was occurring in 1999 appears to be subject to landfilling activities. Several trucks are present, alongside industrial moving equipment. Several commercial and industrial properties are located between Kumeu and Huapai. These include; a Gull and Z petrol station, timber storage yard, several restaurants, a bank and a concrete yard. It is unclear when these activities commenced from the aerial photography however they are located outside of the project area. Residential development surrounding Waimauku has intensified.
2017	<ul style="list-style-type: none"> Development on the Brigham Creek roundabout has been completed. No further changes of significance are noted within the project area.

4.2 Auckland Council Information

A site contamination enquiry was made to Auckland Council on 12 March 2018, with a preliminary response received on 19 March 2018 (**Appendix C**). The response identified a large number of sites throughout the project area that have been registered as listed on the Hazardous Activities and Industries List (HAIL) and are therefore considered potentially contaminative.

Preliminary observations based on a GIS aerial photography review identified the following sites as HAIL (**Table 2**). It was noted that this did not constitute a full HAIL check, although such a review would follow. Several properties have been removed from the list received by Auckland Council due to them being outside the project area.

Table 2: Auckland Council Contamination Enquiry

Site Location	HAIL Activity
218-220 SH16	Site is used for current/ historical horticultural activity, with glasshouses on site.
6 Joyce Adams Place	Site is used for current/ historical horticultural activity, with glasshouses on site.
529-751 SH16	Site is used for current/ historical horticultural activity, including glasshouses.
32 Meryl Avenue	Site is used for current/ historical horticultural activity, including glasshouses.
307 Matua Road	Site is used for current/ historical horticultural activity.
307 Matura Road and 726 SH16	Site is used for current/ historical horticultural activity.
482 SH16	Site is used for current/ historical horticultural activity.
465 SH16	Site is used for current/ historical horticultural activity.
191 SH16	Site is used for current/ historical horticultural activity.
8 Kennedys Road	Site is used for current/ historical horticultural activity.
291 and 299 SH16	Site is used for current/ historical horticultural activity.
331 SH16 / 1368 Coatesville- Riverhead Highway	Site is used for current/ historical horticultural activity.
393-451 SH16	Site is used for current/ historical horticultural activity, including glasshouses.
464 SH16	Site is used for current/ historical horticultural activity.
482 SH16	Site is used for current/ historical horticultural activity.
300-455 SH16	Site is used for current/ historical horticultural activity, including glasshouses.

It was also noted on the response from Auckland Council that there is potential for fill material to exist on the sites immediately adjacent to the railway line. No justification or property address was provided with this statement.

A full contaminated site response was obtained from Auckland Council on 5 April 2018 (**Appendix D**). The response stated that the following were reviewed in order to provide an assessment:

- Databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents and environmental assessments within a 100m radius of the project area.
- No pollution incident files regarding spills/ contamination were identified for the project area.
- Records in relation to individual horticultural sites in the region were not reviewed.

Table 3 below details the information provided by Auckland Council. Information deemed not relevant to the project area has not been included below.

Table 3: Auckland Council Contamination Site Response

Site Location	Consent ID	Purpose	Activity Description	Consent Status	Comments
161-169 SH16	#21152	Discharge of contaminants to land or water associated with the proposed land disturbance activities (remediation) by the removal of soil containing elevated contaminant concentrations.	Change of conditions dated 26/03/2009 to allow Remediation Action Plan (RAP) addendum which covers remediation of an additional site at Totara Creek Crossing. Contamination in fill to be removed from site.	Granted 23/04/2009. Now expired.	Site appears to be the now Brigham Creek and SH16 roundabout and therefore directly adjacent to the project area.
161-169 SH16	#21152	Discharge of contaminants to land or water associated with the proposed land disturbance activities (remediation) by the removal of soil containing elevated contaminant concentrations.	Change of conditions dated 26/03/2009 to allow Remediation Action Plan (RAP) addendum which covers remediation of an additional site at Totara Creek Crossing. Contamination in fill to be removed from site.	Granted 05/02/2009. Now superseded.	Site appears to be the now Brigham Creek and SH16 roundabout and therefore directly adjacent to the project area.

4.3 Site Walkover

Due to the extent of the project area a site walkover was unable to be undertaken as part of this PSI. However, a drive through of the project area was completed by a Beca Environmental Scientist on 19 March 2017 with the following observations made.

The majority of the potential HAIL activities noted throughout the project area were orchards (including vineyards). Several barns/ sheds were also noted near the alignment, likely associated with either current or historical orchard activities.

A winery was identified at 366 SH16 (RS/RP 016-0019-B/3). Further review identified the winery as The Soljans Estate Winery.

A BP service station was identified opposite the Old Railway Road intersection at 538 SH16 (RS/RP 016-0019-B/3.5).

What appeared to be a pumping yard or transformer station is located at 733 SH16. The exact land use here was unable to be identified during the drive through. Further information sourced from the Auckland Council GeoMaps system has identified the following assets passing through the site, as per **Figure 2** below.

- Liquid fuels pipelines Marsden to Wiri (brown line)
- Vector transmission lines (purple line)

This property is hereon referred to as a liquid fuel transmission yard.



Figure 2: Assets associated with 733 SH16

A 'Vector Hub' with a potential transformer was located at 1 Factory Road, at the end of the project area. Again, the exact land use here was unable to be identified during the drive through and no assets were located within this location on the Auckland Council GeoMaps system. Work surrounding this area is limited to shallow pavement works and risk of any potential contamination from a transformer within the 'Vector Hub' are considered low.

4.4 Upgrades through existing road surface

Improvement works will tie in to, or involve the direct upgrade of, the existing road surface in most areas.

The presence of gas works waste (coal tar) is considered not to be present within the road (at a 'more likely than not' level of certainty) based on the date in which it was constructed and proximity to Auckland central.

The position currently held by Auckland Council and Auckland Transport is that the need for closer assessment via the consenting process would be triggered when concentrations exceed the Soil Contaminant Standard for Industrial Outdoor workers (SCS) i.e. at >35ppm BaP equivalent.

Sampling will be undertaken prior to work commencing for assistance in determining disposal options of this material. Should any indicators of coal tar be present from the analysis of samples at this time, then this will be raised as a consenting issue and the appropriate assessment under the NESCS will be undertaken.

5. DISCUSSION

5.1 Summary of Information Search

The historical aerial review has identified several properties along the project area that have been subject to potentially contaminative activities associated with horticultural activities, specifically orchards and vineyards. In association with such activities, several commercial buildings have been identified, including wineries, grower's sheds and cafes. The contamination assessment undertaken by Auckland Council identified the following sites as potentially contaminative based on a historical aerial review:

- 218-220 SH16
- 6 Joyce Adams Place
- 529-751 SH16
- 32 Meryl Avenue
- 307 Matua Road
- 726 SH16
- 482 SH16
- 465 SH16
- 191 SH16
- 8 Kennedys Road
- 291 and 299 SH16
- 331 SH16 / 1368 Coatesville- Riverhead Highway
- 393-451 SH16
- 464 SH16
- 482 SH16
- 300-455 SH16

In addition to the above, based on the aerial review undertaken within this report, it is considered that the following sites have also been subject to potentially contaminative activities associated with horticultural land uses:

- 505 SH16
- 550 SH16

Further information received from Auckland Council identified a discharge consent for 161-169 SH16 for the discharge of contaminants to land or water associated with the proposed land disturbance activities (remediation) by the removal of soil containing elevated contaminant concentrations. This site is located approximately 50m outside of the project works area.

The site walkover undertaken by a Beca Environmental Scientist also identified the following potentially contaminative sites located adjacent the project area:

- 538 SH16 (BP Service Station)
 - ~60m from SH16 upgrades
- 733 SH16 (liquid fuel transmission yard)
 - Adjacent to SH16 upgrades
- 1 Factory Road (Vector Hub with potential transformer)
 - Adjacent to SH16 upgrades

5.2 Contaminants of Potential Concern

Review of the site historical information has identified the following land use activities which may have resulted in the contamination of soils within the project area. Contaminants of potential concern associated with these activities have also been identified in **Table 4** below.

Table 4: Contaminants of Potential Concern

Site Address	Activity	HAIL Code	Contaminants of Potential Concern
<ul style="list-style-type: none"> • 218-220 SH16 • 6 Joyce Adams Place • 529-751 SH16 • 32 Meryl Avenue • 307 Matua Road • 726 SH16 • 482 SH16 • 465 SH16 • 191 SH16 • 8 Kennedys Road • 291 and 299 SH16 • 331 SH16 / 1368 Coatesville-Riverhead Highway • 393-451 SH16 • 464 SH16 • 482 SH16 • 300-455 SH16 • 505 SH16 • 550 SH16 	Horticultural activities specifically vineyards and orchards and associated commercial activities including wineries and growers.	A10 – persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds.	<ul style="list-style-type: none"> • Heavy metals (including Arsenic, Cadmium, Chromium, Copper, Lead and Mercury) • Acidic herbicides • Organophosphates • Organochlorines
<ul style="list-style-type: none"> • 733 SH16 	Liquid fuel transmission line – Marsden to Wiri	A13 – Petroleum or petrochemical industries including... bulk storage or petroleum or petrochemicals above or below ground.	<ul style="list-style-type: none"> • Total petroleum hydrocarbons • BTEX

- The site located at 161-169 SH16 and discussed in **Section 5.1** above has not been included in **Table 4** as this site is not located within the project area (approximately 50m east) and is therefore not subject to land use activities that may create a potential exposure pathway for onsite or nearby receptors. In conjunction with this, the discharge consent issued by Auckland Council was for the ‘remediation of soil’ containing elevated contaminant concentrations. It is therefore considered unlikely that contaminants remain at concentrations considered a risk to human health under a commercial/ industrial land use scenario at this distance away from the site.
- The ‘Vector Hub’ with a potential transformer is situated outside the works area. Works approximately ~30m away from this site involve shallow excavation and pavement upgrades only within the extent of the existing road surface. It is therefore ‘more likely than not’ that this HAIL activity has not been undertaken within the vicinity of soils to be disturbed for this project.
- The liquid fuel transmission yard is situated outside the works area. Works are ~10m from this site, and involve shallow shoulder works of the existing road’s surface. The pipe carrying fuel runs directly under SH16 at a depth greater than 1m below ground level. Shallow works in this area are only expected to be to a depth of ~500mm below ground level. Soils in the vicinity of this pipeline are therefore not going to be disturbed, and the likelihood of this pipeline having contaminated soils nearby is considered unlikely. Conservatively, the pipeline easement (~10m either side of the pipeline) has been included as HAIL in Table 4, however the transmission yard has been excluded given its proximity further from works. This assessment does not address or supersede any health and safety plans or assessments related to working in the vicinity of this pipeline.

- The service station identified alongside SH16 is ~60m away from the shoulder widening associated with these improvements. As works associated with the SH improvements only involve shallow excavations (<0.5m deep) and are immediately adjacent to the roadway it is therefore considered 'more likely than not' that this HAIL activity has not been undertaken within the vicinity of soils to be disturbed for this project.

5.3 Exposure Pathway Assessment

The Conceptual Site Model (CSM) see **Table 5** below was developed in order to inform the assessment and describe the relationship between sources of contamination at the site, the human and environmental receptors that may be exposed to those contaminants in the context of the use of the site, and the pathways by which those receptors may be exposed.

Table 5: Conceptual Site Model

Source	Receptor	Pathway	Pathway Complete?
Potential contaminants from adjacent land uses as identified in Section 5.2 .	Construction workers	Exposure of workers to contaminants in soils and groundwater during site redevelopment – dermal contact, ingestion or inhalation of dust/vapours.	Potentially Complete Pathway - levels of contaminants may be presents at concentrations that may pose a risk to human health in the locations where the project area intercepts the sites identified as potentially contaminative.
	Future site users	Exposure of future site users to contaminants in soils – dermal contact, ingestion or inhalation of dust/vapours.	Incomplete Pathway - continuous hard standing surface means that no exposure to potential contaminants will occur.
	General public	Exposure of general public to contaminants in soils– dermal contact, ingestion or inhalation of dust/vapours.	Incomplete Pathway - continuous hard standing surface means that no exposure to potential contaminants will occur.
	Groundwater resources for public consumption	Leaching and migration of soil contaminants into groundwater.	Potentially Incomplete Pathway – anticipated earthworks are considered unlikely to reach groundwater levels.
	Surface water	Sediment and runoff directly into surface water bodies present along the project area.	Potentially Complete Pathway - the exposure pathway can be managed through management plan controls.

6. DEVELOPMENT IMPLICATIONS

6.1 Consents

6.1.1 National Environmental Standard

As discussed in **Section 2.2** the proposed works may be subject to change and at present, soil disturbance and disposal volumes within each identified HAIL are highly likely to be within the permitted activity volumes of Regulation 8(3) of the NESCS on a site-by-site, 'piece of land' basis, given the limited top soil disturbance and re-battering of neighbouring properties. However, works are anticipated to last longer than the 2 month permitted activity threshold, therefore making it unlikely for the project to meet the permitted activity criteria.

The ability to sample soils that are likely to be disturbed during works was not possible at the time of drafting this PSI. It is therefore recommended a discretionary activity consent under the NESCS is applied for based on the provision of this PSI and no intrusive sampling (in the form of a DSI) being undertaken.

A Contaminated Soils Management Plan (CSMP) is provided with this PSI to support the NESCS discretionary activity application.

Sampling is to be undertaken on a site-by-site basis within the identified HAIL properties to be earth-worked along the project alignment once works are confirmed. These assessments will be isolated areas of neighbouring land where soil disturbance is to occur and will enable the correct disposal options to be understood prior to works commencing.

Appendix E provides indication of the properties that have been identified as HAILs and which have minor works occurring within their boundaries. The CSMP prepared and submitted with consent application outlines all handling procedures associated with working within these HAIL sites.

6.2 Site Management Controls

The exposure pathway assessment has identified two potentially complete exposure pathways; ingestion and inhalation of contaminants by construction workers and the discharge of contaminants to nearby surface water receptors. A CSMP has been developed in order to manage and mitigate the potential risks to those on site during the works.

Sediment entering the surrounding surface water and sensitive environmental receptors could be sufficiently mitigated and managed through the implementation of specialist controls during proposed land disturbance works. Erosion and sediment control practices are outlined in the *SH16 Improvements Erosion and Sediment Control Plan* for the project.

6.3 Disposal Options

Soils excavated during the proposed works may require disposal off-site if they are structurally unsuitable for re-use. Each licensed landfill/managed fill and clean fill site within the Auckland Region is consented by Auckland Council and has specific acceptance criteria which dictate what materials can be accepted.

Soil sampling and analysis is to be conducted on material excavated within HAIL sites identified along the project's alignment. Acceptance of materials should be confirmed by landfill operators prior to commencement of earthworks. As no DSI will be undertaken, it is anticipated sampling of soil will be on a site-by-site basis aligned with the project staging. This process will effectively allow for the

sampling and analysis of all potential contaminated sites and inform the appropriate disposal options for the contractor.

If shown to be appropriate for reuse (i.e. within background concentrations), soil from HAIL sites will be allowed to be reused in batter slopes or fill areas along the length of the alignment.

7. CONCLUSIONS

This desk based study has identified a number of properties as being potentially contaminated which involve minor works within their boundaries or neighbouring their boundary. All HAILs are associated with past or present horticultural land use, with the addition of the single Wiri-Marsden liquid fuel transmission line.

Only 13 of the horticultural properties have works occurring within their boundary. The majority of these instances involve the disturbance of soil within 0-5m of their property boundary to obtain an appropriate batter slope for the widened road corridor.

NESCS permitted activity criteria for the disturbance and disposal of soil within the neighbouring horticultural properties and adjacent to the Wiri-Marsden transmission line are highly likely to be met on a case-by-case or 'piece of land' basis for each HAIL. However, due to works being over the 2-month permitted activity threshold it is recommended a discretionary activity consent under the NESCS is applied for. Given the contaminants of concern are pesticides applied to the horticultural crops, and the exposure pathway is restricted to dermal contact and dust inhalation by construction works, it is unlikely the timeframe of soil exposure of this two-month threshold will generate any additional risk. In addition, the slopes will be stabilised to an erosion resistant state once design grade is obtained.

The provision of the CSMP to support this discretionary activity approach will outline management procedures and mitigate any potential risk that may be present for works within the HAIL properties. This method will allow correct procedures to be followed for each identified site and allow sampling to be conducted to inform disposal option assessment.

8. LIMITATIONS

This report has been prepared by the Safe Roads Alliance. This report is prepared solely for the purpose of the assessment of potential soil contamination (Scope). The contents of this report may not be used for any purpose other than in accordance with the stated Scope.

This report is confidential and is prepared solely for the Safe Roads Alliance. The Safe Roads Alliance accepts no liability to any other person for their use of or reliance on this report, and any such use or reliance will be solely at their own risk.

In preparing this report the Safe Roads Alliance has relied on key information including the following: historical aerial photographs from the Auckland Council GeoMaps and Retrolens, discharge consent information provided by Auckland Council, and Site Contamination Information provided by Auckland Council.

This report contains information obtained by inspection or other means of investigation. Unless specifically stated otherwise in this report, the Safe Roads Alliance has relied on the accuracy, completeness, currency and sufficiency of all information provided to it by, or on behalf of, the Client or any third party, including the information listed above, and has not independently verified the information provided. The Safe Roads Alliance accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the information provided. Publicly available records are frequently inaccurate or incomplete.

The contents of this report are based upon our understanding and interpretation of current legislation and guidelines (“Standards”) as consulting professionals, and should not be construed as legal opinions or advice. Unless special arrangements are made, this report will not be updated to take account of subsequent changes to any such Standards.

This report should be read in full, having regard to all stated assumptions, limitations and disclaimers.

Appendix A
Design Plans

Appendix B

Historical Aerial Photographs

1940



70370



70370

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Sourced from <http://catrolens.nz> and licensed by LINZ CC-BY 3.0

1940



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70306



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1940



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70338

1950

A 200184

A 200185

1914 / 18



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1950

A 200149

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1913 / 12



1950

A 200147



41 / 5161

A 200146

1950

A 200145



51 / 5161

A 200144

1950

A 200185

GI / 4161

A 200185



1961



№ 250
3083
114.36



HOCKLAND
PHOTOGRAMS
75 MENHEAD
GREYVA 8000
2-9-61

1963

№ 250



3231/38

11500
KIMEU WAHKE
27-4-63



1963

11500
KIMEU WAHKE
27-4-63

3230/31



№ 250
188
209.76



1963

KAMEU
WAIHEKE
11500
27-4-63

3230/32



Nr 250
7832
209.76

1963

KAMEU
WAIHEKE
11500
27-4-63

3230/34



Nr 250
7834
209.76

1972



N42
16500
4-4

3552



4598 / 2



Nr 250
209.76

1973

92 76



SN 3800 A / 13



1975

N42
16500
M-4

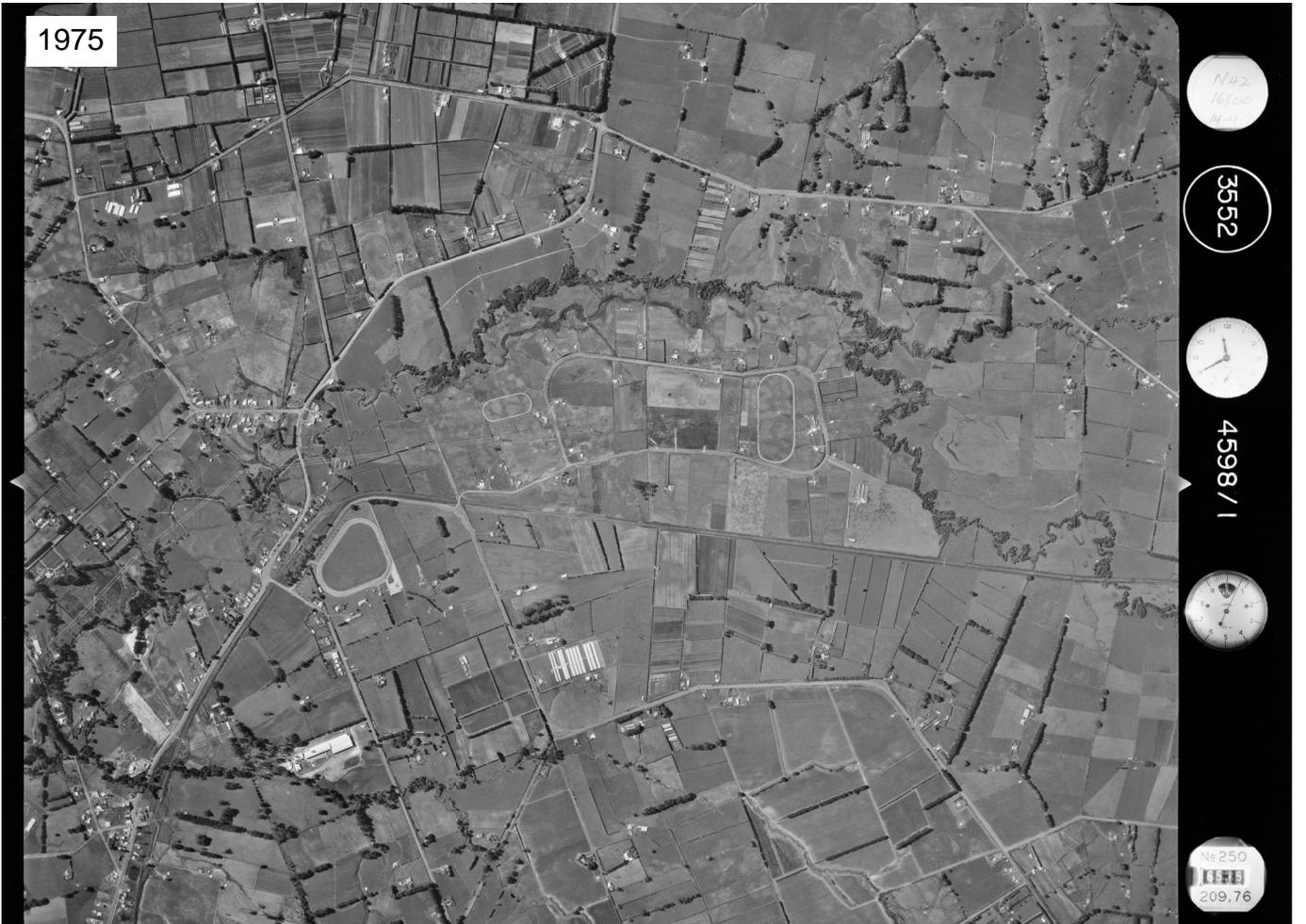
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1981



NO. 1000
MONUMENTAL
PRESERVATION
EARTH

SN 5783

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 HELDVILLE
 12500 FT
 12500 FT
 HELDVILLE
 12500 FT



1999



1999



1999



2010



2010



2010



Appendix C

Auckland Council Preliminary Response

Curtis Blyth

From: Claire Lacina <claire.lacina@aucklandcouncil.govt.nz> on behalf of RECContamination <reccontamination@aklc.govt.nz>
Sent: Monday, 19 March 2018 9:23 AM
To: Hollie Griffith
Subject: RE: HAIL Enquiry

Hi Hollie,

This email is in response to your recent enquiry requesting available site contamination information that was held within the Environmental Health Unit of the Licensing and Compliance Services Department (LCS).

Due to the large number of sites for this enquiry, and as our records are property-specific, it will take a few weeks to get through our regulatory records for each property in relation to any identified or potential HAIL activities on each site.

As an initial starting point, please see the below information which has been identified using our GIS aerial photographs for historical horticultural and potential HAIL activity – please note this information does not encompass a full HAIL check. We recommend the property files are requested for the sites below to start. Please let me know if this timeframe is suitable for your request, and I will carry out the full HAIL assessment.

- 218-220 SH16: Our GIS records indicate this site as used for historical/current horticultural activity, with glasshouses on site.
- 5 Kennedys Road: Our GIS records indicate this site as possibly been used for historical horticultural activity.
- 17-19 Kennedys Road: Our GIS records indicate this site as used for historical/current horticultural activity, with glasshouses on site.
- 6 Joyce Adams Place: Our GIS records indicate this site as used for historical/current horticultural activity, with glasshouses on site.
- 529 to 751 SH16: Our GIS records indicate these sites as used for historical/current horticultural activity, including glasshouses.
- 32 Meryl Avenue: Our GIS records indicate these sites as used for historical/current horticultural activity, including glasshouses.
- 307 Matua Road: Our GIS records indicate these sites as used for historical/current horticultural activity.
- 307 Matua Road and 726 SH16: Our GIS records indicate these sites as used for historical/current horticultural activity.
- 45 Station Road: Our GIS records indicate this site as used for historical/current horticultural activity and winemaking facilities.
- 77 Nobilo Road: Our GIS records indicate these sites as used for historical/current horticultural activity.
- 223 Main Road: Our GIS records indicate these sites as used for historical/current horticultural activity.
- 94 Main Road: Our GIS records indicate possible fill and historical joinery factory, charcoal producing plant, and timber yard activities at this site.
- 550 SH16: Our GIS records indicate these sites as used for historical/current horticultural activity.
- 482 SH16: Our GIS records indicate these sites as been used for historical horticultural activity.
- 465 SH16: Our GIS records indicate these sites as been used for historical horticultural activity.
- 191 SH16: Our GIS records indicate these sites as been used for historical horticultural activity.
- 8 Kennedys Road: Our GIS records indicate these sites as been used for historical horticultural activity.
- 291 and 299 SH16: Our GIS records indicate these sites as been used for historical horticultural activity.
- 331 SH16 / 1368 Coatesville-Riverhead Highway: Our GIS records indicate these sites as used for current/historical horticultural activity.
- 393 to 451 SH16: Our GIS records indicate these sites as used for current/historical horticultural activity, including glasshouses.
- 464 SH16: Our GIS records indicate these sites as been used for historical horticultural activity.
- 482 SH16: Our GIS records indicate these sites as been used for historical horticultural activity.

- 300-455 SH16: Our GIS records indicate these sites as used for current/historical horticultural activity, including glasshouses.
- There is potential for fill to exist on the sites adjacent to the railway line.

Please note that only council's soil contamination records within the LCS department and GIS map have been checked. There may be other soil contamination information held within:

1. Contaminated Site Enquiry team: ContaminatedSites@aucklandcouncil.govt.nz
2. Property File for viewing reports or all relevant information relating to the property -Requested from the local service centre, by phone, 09 3010101.

Kind regards,

**Claire Lacina | Technical Officer – Environmental Health
Specialists Input | Resource Consents**
Ph 09 3522621 (Int 465621) | Mob 021 718 038
Auckland Council, Level 1, 35 Graham Street, Auckland
Visit our website: www.aucklandcouncil.govt.nz

From: Hollie Griffith [mailto:Hollie.Griffith@beca.com]
Sent: Monday, 12 March 2018 2:56 p.m.
To: RECContamination
Subject: HAIL Enquiry

Hi there,

Would you please be able to check if you have any information pertaining to a HAIL activity having been undertaken across the following site investigation area, also shown in the maps attached – State Highway 16 Brigham Creek to Factory Road.

A site contamination enquiry request form has already been sent out but I have been advised to check here as well.

Thanks for your help.

Kind regards,

Hollie Griffith

Environmental Scientist
Beca

Phone: +64 9 300 9000 Fax: +64 9 300 9300
DDI: +64 7 577 1151 Mob: +64 27 513 4057

www.beca.com

igniteyourthinking.beca.com



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Appendix D
Auckland Council
Contamination Response

5 April 2018

Beca Infrastructure Limited

PO Box 6345

Wellesley St

Auckland 1141

Attention: Hollie Griffith

Dear Hollie

Site Contamination Enquiry – SH16 Brigham Creek to Factory Road (ROAD)

This letter is in response to your enquiry requesting available site contamination information for the above site. The following details are based on information available from the former Auckland Regional Council records system and information currently held by the Auckland Council Natural Resources and Specialist Input Unit. The details provided below exclude any property information held by the former district/city councils.

No pollution incident files regarding spills/contamination were found for the above site. The general catchment file and site visit file were not searched. These files contain pollution incidents where the source of pollution was not traced to a particular site, site visits where no follow-up correspondence was required and some information from archived files.

If the above site is coastal or beside a river, it is possible that historic, unconsented reclamation may have occurred. The Auckland Council Specialists Unit Coastal Team may be able to provide further information.

The records reviewed as part of this Site Contamination Enquiry search do not identify individual horticultural sites in the region. However, there is a possibility that horticultural activities may have occurred at the site. The local Auckland Council customer service centre, specific to the area of the site may be able to provide relevant information where former horticultural sites have been mapped.

If you are concerned that a historic land use (such as filling) may have caused the underlying soils to become contaminated, it is recommended that you obtain an independent environmental assessment of the site. Staff from the Auckland Council Earthworks and Contaminated Land Team can provide advice on the results of any evaluation in terms of site remediation and/or potential consent requirements.

The former Auckland Regional Council and current databases were searched for records of landfill, bore, air discharge, industrial and trade process consents, contaminated site discharge consents, and environmental assessments within a 100m radius. Relevant details of the pollution incidents and identified consents are appended to this letter as an excel spreadsheet. **Please refer to the column labelled 'Property Address' on the spreadsheet to aid in identifying corresponding data on the map.**

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

In addition, further site specific pollution incidents may be held at the area office below. It is recommended that you contact the local customer service centre of the Auckland Council, specific to the

site being investigated: Ground Floor, Kotuku House, 4 Osterley Way, Manukau Central as they also may hold files with further relevant information.

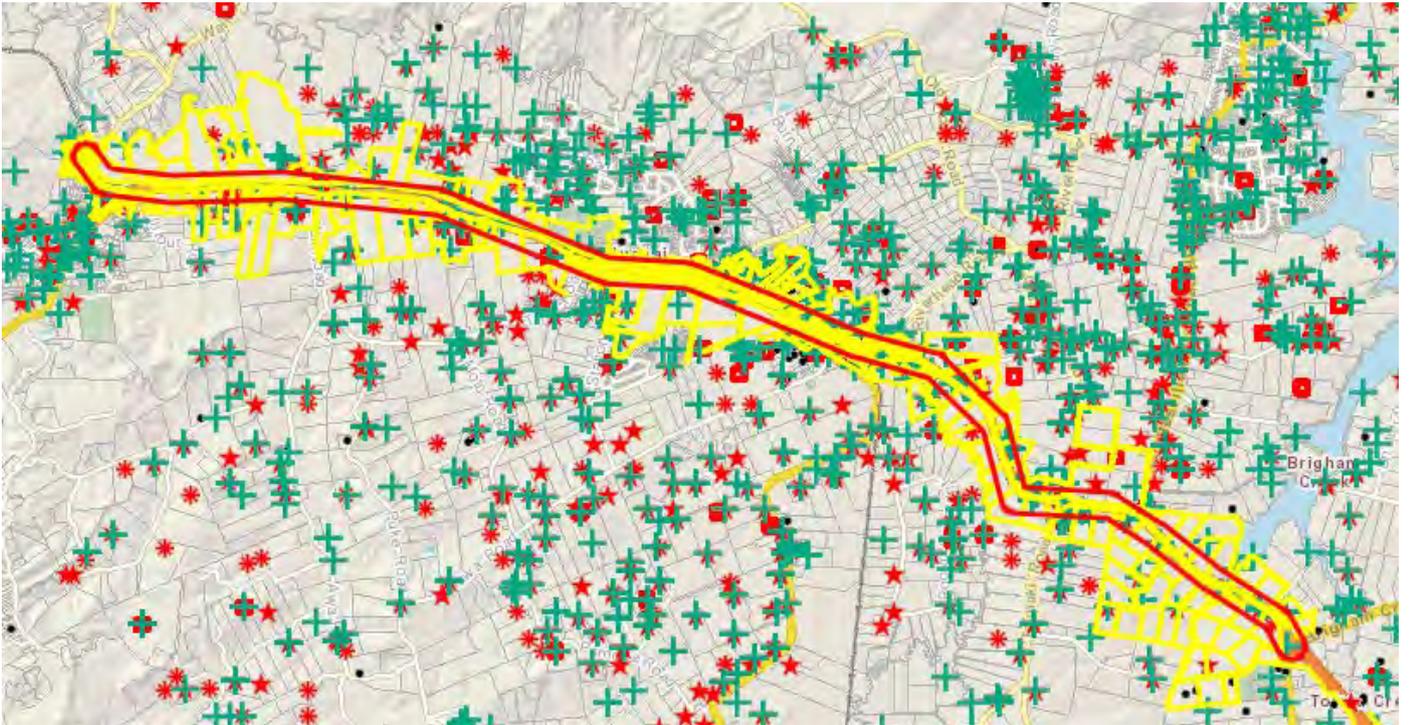
I trust that this answers your query. If you wish to discuss the matter further, please contact **Andrew Kalbarczyk** on 301 0101. Should you wish to request any of the files listed above for viewing, please contact the Auckland Council Call Centre on 301 0101 and note you are requesting former Auckland Regional Council records (the records department requires three working days' notice to ensure files will be available).

Please note: the Auckland Council cost recovers officer's time for all site enquiries. A basic enquiry takes approximately 1 - 2.5 hours to search the files and databases in which information is held. As such an invoice for the time involved in this enquiry will follow shortly.

Yours sincerely,

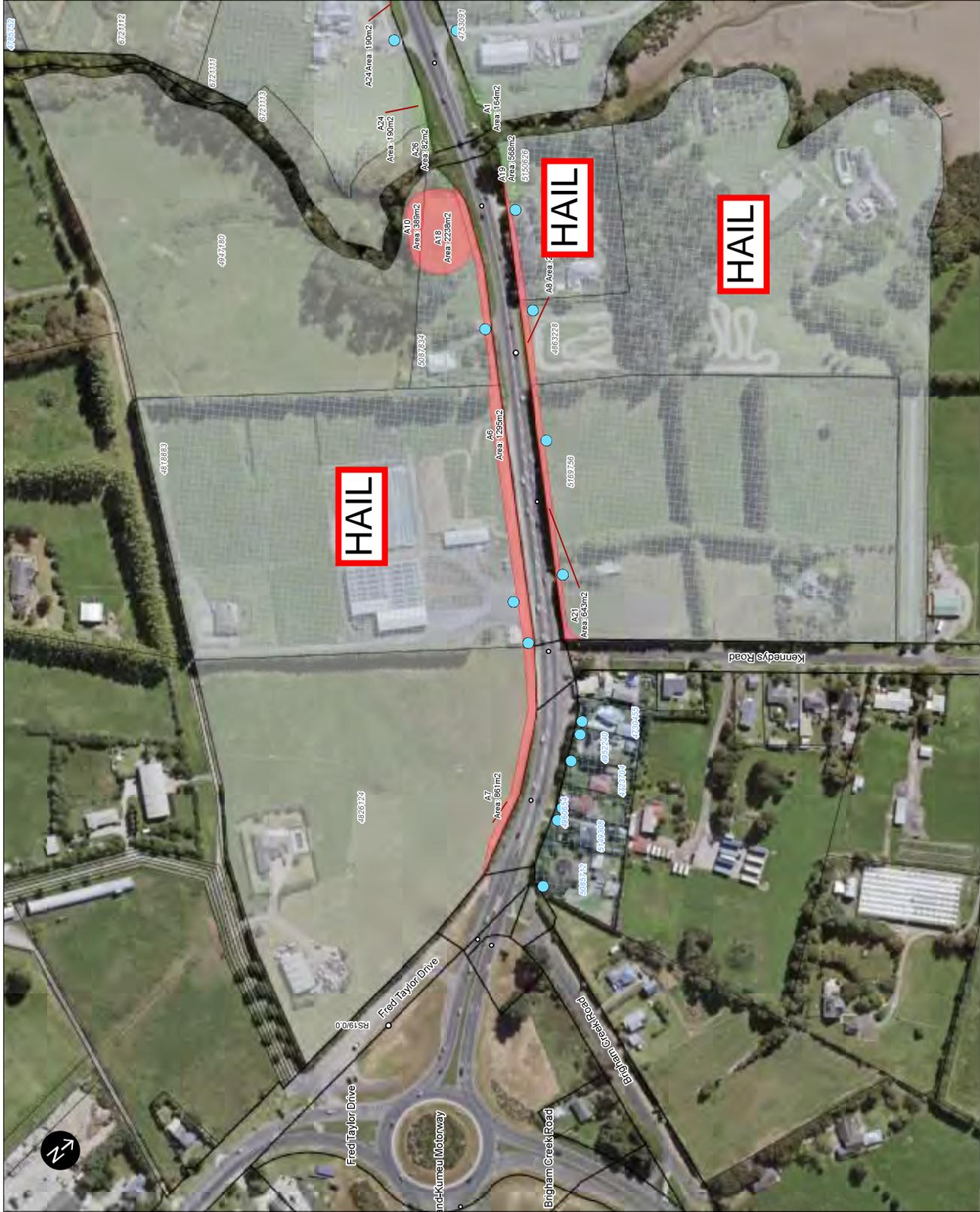


Jared Osman
**Team Leader – Contaminated Air, Noise
Specialist Unit | Resource Consents**



Appendix E

Extent of works and HAIL identifier plans



Legend

- SH Distance Markers 500m
- SH Distance Markers 100m
- Possible Driveway Changes Needed

Land Possibly Required (Approximate)

- Permanent Land Requirement
- AT Vested Property
- Additional Temporary Land Requirement
- NZ Primary Road Parcels
- NZ Primary Land Parcels
- Parcels With Land Possibly Required
- Parcels With Possible Driveway Changes Needed

This map contains data derived in part or wholly from sources other than Beca, and therefore, no representations or warranties are made by Beca as to the accuracy or completeness of this information.

Map intended for distribution as a PDF document. Scale may be incorrect when printed.

Aerial Imagery flown 2015 for Auckland Council.



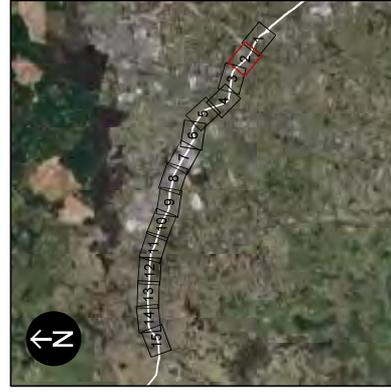
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4	SCP	DC/FT	DC/FT	17/08/2017
3	SCP	DC/FT	DC/FT	17/08/2017
2	SCP	DC/FT	DC/FT	16/08/2017

SH16 Brigham Creek to Waimauku
Possible Land Requirement - Preferred Option Zones A to E

Client: NZ Transport Agency
 Project: Safe Road Alliance - Core Project

Discipline: GIS
 Drawing No: GIS-3411907-2554
 Page 1 of 15



Legend

- SH Distance Markers 500m
- SH Distance Markers 100m
- Possible Driveway Changes Needed

Land Possibly Required (Approximate)

- Permanent Land Requirement
- AT Vested Property
- Additional Temporary Land Requirement

Parcels

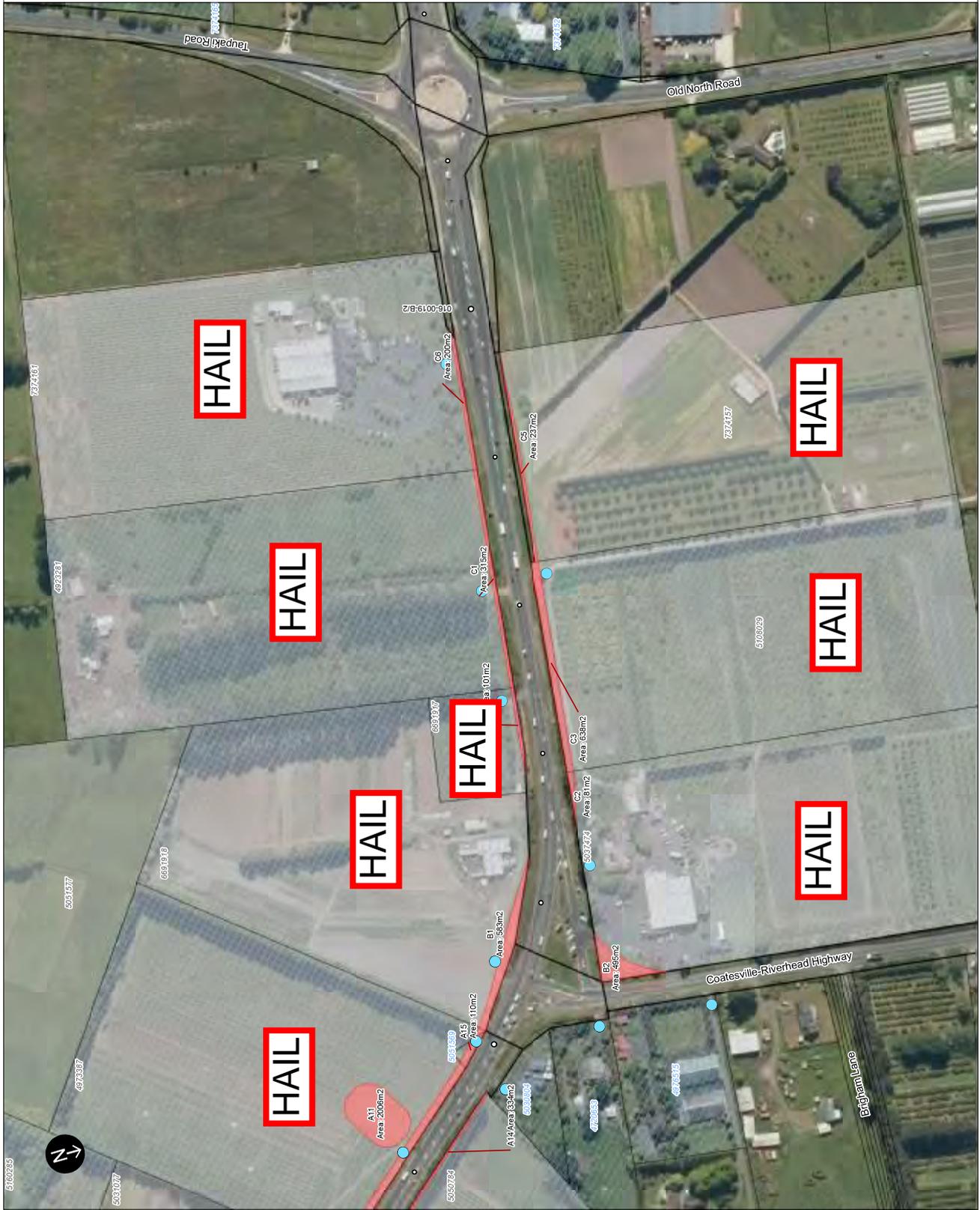
- NZ Primary Road Parcels
- NZ Primary Land Parcels
- Parcels With Land Possibly Required
- Parcels With Possible Driveway Changes Needed

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Map Scale @ A3: 1:2,500		Revision		Author		Verified		Approved		Date	
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5		4		SCP		DBA/FT		DBA/FT		17/06/2017	
0		3		SCP		DBA/FT		DBA/FT		17/06/2017	
0		2		SCP		DBA/FT		DBA/FT		20/06/2017	
<p>Client: NZ Transport Agency</p> <p>Project: Safe Road Alliance - Core Project</p> <p>SH16 Bringham Creek to Waimauku</p> <p>Possible Land Requirement - Preferred Option Zones A to E</p>											
<p>Discipline: GIS</p> <p>Drawing No: GIS-3411907-255A</p> <p>Page 2 of 15</p>											



Legend

- SH Distance Markers 500m
- SH Distance Markers 100m
- Possible Driveway Changes Needed

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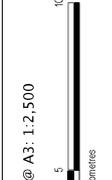
Aerial Imagery flown 2015 for Auckland Council.

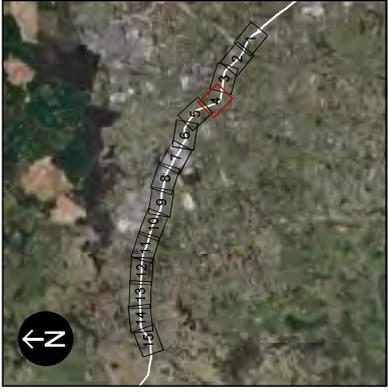
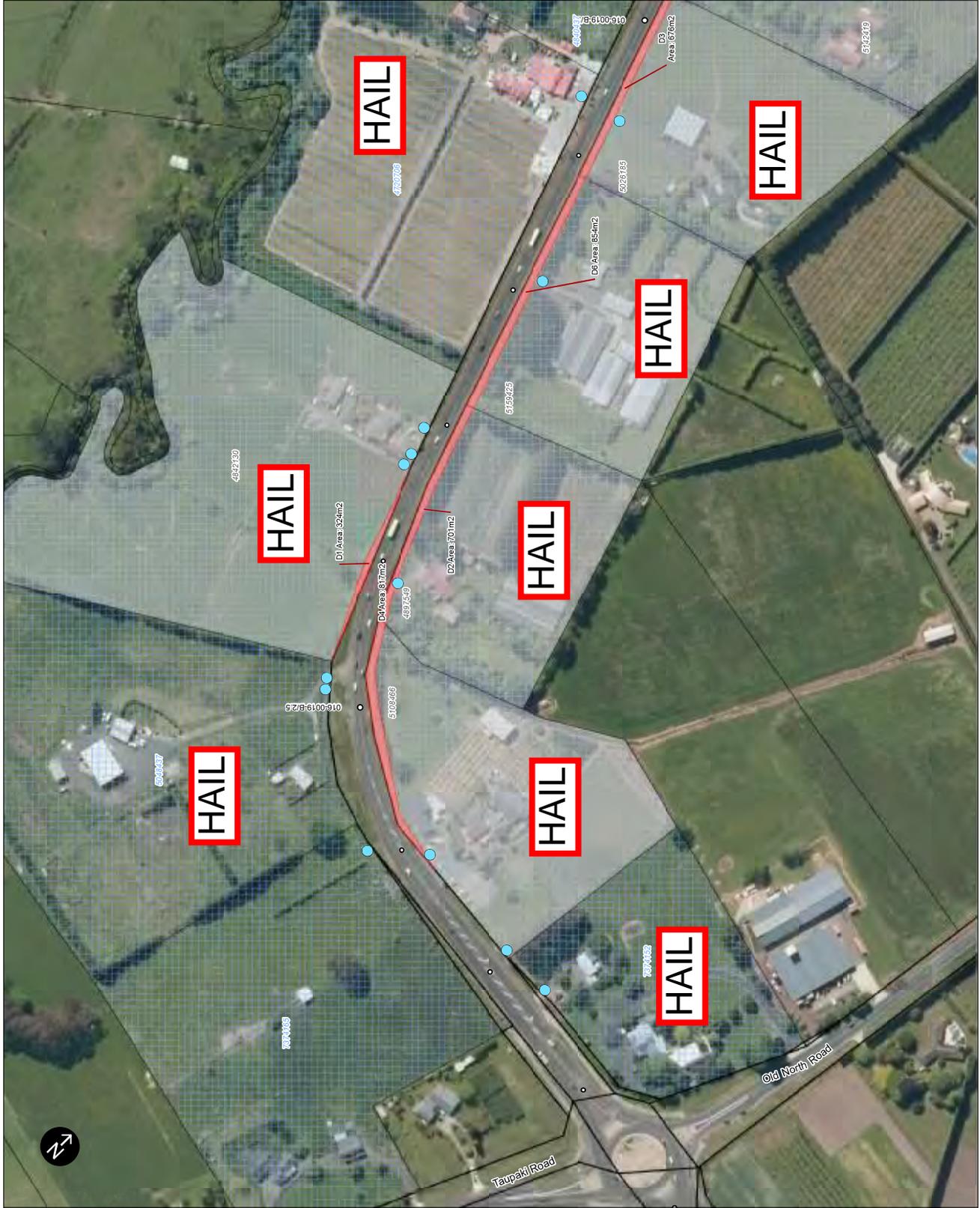
SH16 Brigham Creek to Waimauku
Possible Land Requirement - Preferred Option Zones A to E

Client: NZ Transport Agency
Project: Safe Road Alliance - Core Project

Discipline: GIS
Drawing No: GIS-3411907-2554
Page 3 of 15

Revision	Author	Verified	Approved	Date
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4	SCP	DBAFT	DBAFT	17/08/2017
3	SCP	DBAFT	DBAFT	17/08/2017
2	SCP	DBAFT	DBAFT	16/08/2017





Legend

- SH Distance Markers 500m
- SH Distance Markers 100m
- Possible Driveway Changes Needed

Land Possibly Required (Approximate)

- Permanent Land Requirement
- AT Vested Property
- Additional Temporary Land Requirement

Parcel Types

- NZ Primary Road Parcels
- NZ Primary Land Parcels
- Parcels With Land Possibly Required
- Parcels With Possible Driveway Changes Needed

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Scale may be incorrect when printed.
Aerial Imagery flown 2015 for Auckland Council.

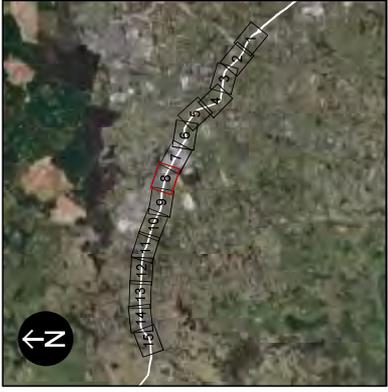
SH16 Brigham Creek to Waimauku
Possible Land Requirement - Preferred Option Zones A to E

Client: NZ Transport Agency
Project: Safe Road Alliance - Core Project

Discipline: GIS
Drawing No: GIS-3411907-255A
Page 4 of 15

Revision	Author	Verified	Approved	Date
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4	SCP	DRIFT	DRIFT	17/08/2017
3	SCP	DRIFT	DRIFT	17/08/2017
2	SCP	DRIFT	DRIFT	16/08/2017

Map Scale @ A3: 1:2,500



Legend

- SH Distance Markers 500m
 - SH Distance Markers 100m
 - Possible Driveway Changes Needed
- Land Possibly Required (Approximate)
- Permanent Land Requirement
 - AT Vested Property
 - Additional Temporary Land Requirement
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4	SCP	DBAFT	DBAFT	17/08/2017
3	SCP	DBAFT	DBAFT	17/08/2017
2	SCP	DBAFT	DBAFT	20/07/2017

SH16 Brigham Creek to Waimauku

Possible Land Requirement - Preferred Option Zones A to E

Client: NZ Transport Agency
 Project: Safe Road Alliance - Core Project



Discipline: GIS
 Drawing No: GIS-3411907-2554
 Page 8 of 15



Legend

- SH Distance Markers 500m
- SH Distance Markers 100m
- Possible Driveway Changes Needed

Land Possibly Required (Approximate)

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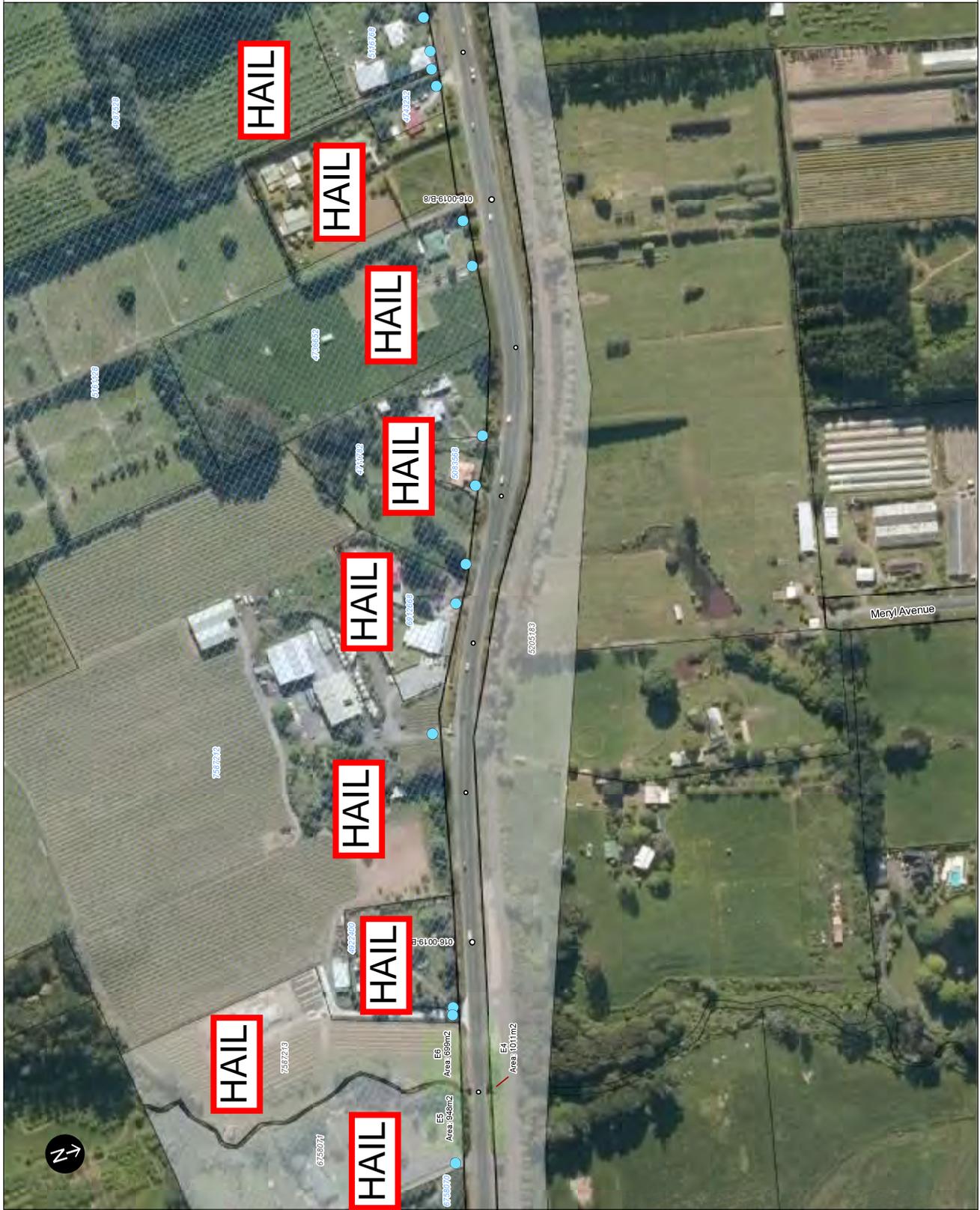
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3	SCP	DCP	DCP	17/08/2017
2	SCP	DCP	DCP	16/08/2017

Client: NZ Transport Agency
Project: Safe Road Alliance - Core Project

Discipline: GIS
Drawing No: GIS-3411907-255A
 Page 9 of 15

SH16 Brigham Creek to Waimauku
Possible Land Requirement - Preferred Option Zones A to E



Legend

- SH Distance Markers 500m
- SH Distance Markers 100m
- Possible Driveway Changes Needed

Land Possibly Required (Approximate)

- Permanent Land Requirement
- AT Vested Property
- Additional Temporary Land Requirement

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 Scale may be incorrect when printed.
 Aerial Imagery flown 2015 for Auckland Council.



Map Scale @ A3: 1:2,500

0 5 10 Meters

Revision	Author	Verified	Approved	Date
5	SCP	MCZ	SPAS	16/08/2017
4	SCP	DBAFT	DBAFT	17/08/2017
3	SCP	DBAFT	DBAFT	17/08/2017
2	SCP	DBAFT	DBAFT	16/08/2017

SH16 Brigham Creek to Waimauku
 Possible Land Requirement - Preferred Option Zones A to E

Client: NZ Transport Agency
 Project: Safe Road Alliance - Core Project

Discipline: GIS
 Drawing No: GIS-3411907-255A
 Page 11 of 15





Legend

- SH Distance Markers 500m
- SH Distance Markers 100m
- Possible Driveway Changes Needed

Land Possibly Required (Approximate)

- Permanent Land Requirement
- AT Vested Property
- Additional Temporary Land Requirement

Parcels

- NZ Primary Road Parcels
- NZ Primary Land Parcels
- Parcels With Land Possibly Required
- Parcels With Possible Driveway Changes Needed

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Aerial Imagery flown 2015 for Auckland Council.

Map Scale @ A3: 1:2,500

0 5 10 Kilometres

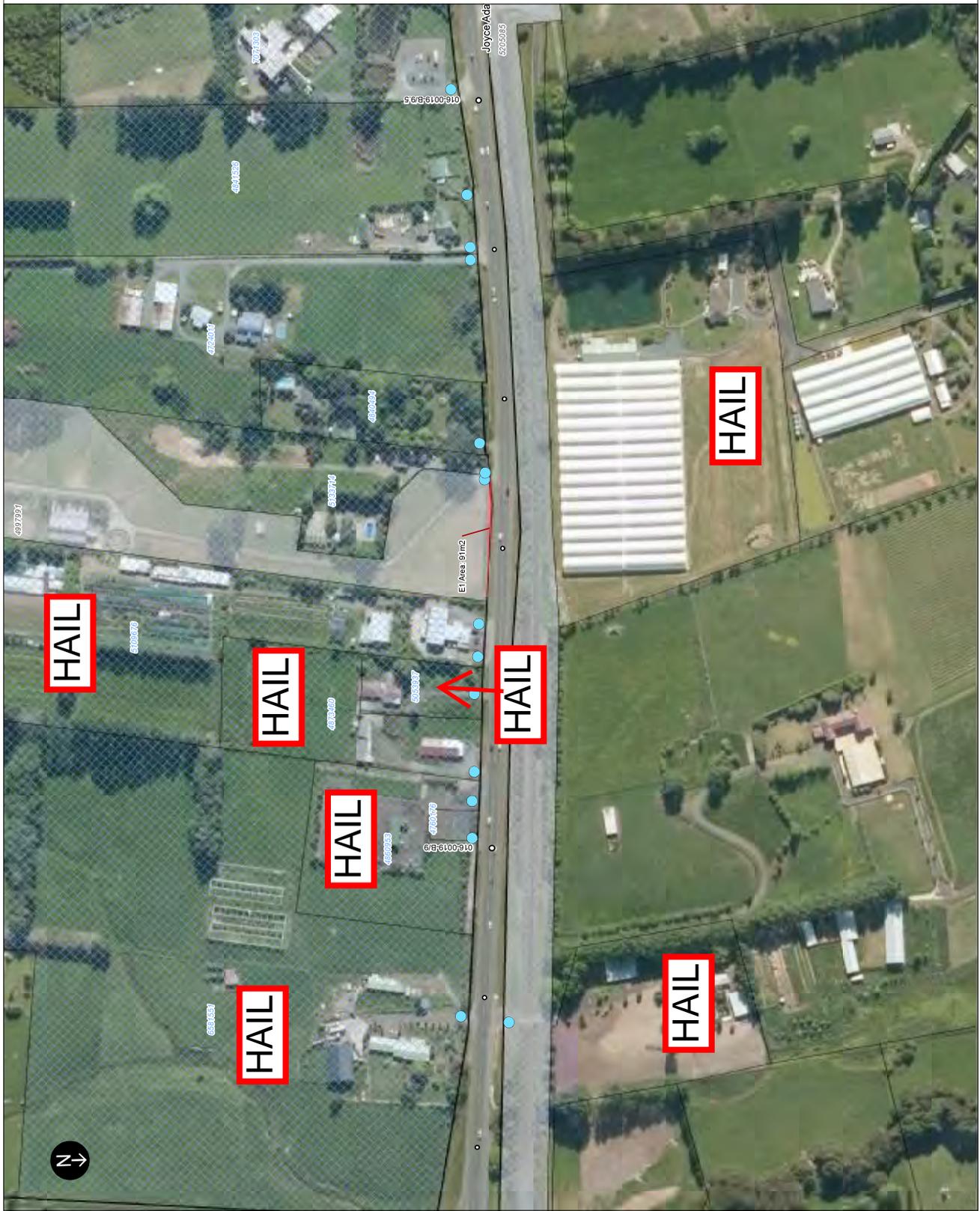
Revision	Author	Verified	Approved	Date
5	SCP	MCZ	SPAS	16/08/2017
4	SCP	DBAFT	DBAFT	17/02/2017
3	SCP	DBAFT	DBAFT	17/02/2017
2	SCP	DBAFT	DBAFT	20/02/2017

SH16 Brigham Creek to Waimauku
Possible Land Requirement - Preferred Option Zones A to E

Client: NZ Transport Agency
Project: Safe Road Alliance - Core Project

Discipline: GIS
Drawing No: GIS-3411907-255A
Page 12 of 15

Safe Roads
TRANSPORT AGENCY



Legend

- SH Distance Markers 500m
- SH Distance Markers 100m
- Possible Driveway Changes Needed

Land Possibly Required (Approximate)

- Permanent Land Requirement
- AT Vested Property
- Additional Temporary Land Requirement

Parcel Types

- NZ Primary Road Parcels
- NZ Primary Land Parcels
- Parcels With Land Possibly Required
- Parcels With Possible Driveway Changes Needed

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Map Scale @ A3: 1:2,500		Revision		Author		Verified		Approved		Date	
10		5		SCP		SCP		SPAS		16/08/2017	
0		2		SCP		DBAFT		DBAFT		17/03/2017	
0		3		SCP		DBAFT		DBAFT		20/02/2017	
0		4		SCP		DBAFT		DBAFT		17/03/2017	
0		5		SCP		DBAFT		DBAFT		17/03/2017	
0		6		SCP		DBAFT		DBAFT		17/03/2017	
0		7		SCP		DBAFT		DBAFT		17/03/2017	
0		8		SCP		DBAFT		DBAFT		17/03/2017	
0		9		SCP		DBAFT		DBAFT		17/03/2017	
0		10		SCP		DBAFT		DBAFT		17/03/2017	
<p>Client: NZ Transport Agency</p> <p>Project: Safe Road Alliance - Core Project</p> <p>SH16 Brigham Creek to Waimauku</p> <p>Possible Land Requirement - Preferred Option Zones A to E</p>											
<p>Discipline: GIS</p> <p>Drawing No: GIS-3411907-255A</p> <p>Page 13 of 15</p>											





Legend

- SH Distance Markers 500m
- SH Distance Markers 100m
- Possible Driveway Changes Needed

Land Possibly Required (Approximate)

- Permanent Land Requirement
- AT Vested Property
- Additional Temporary Land Requirement

Parcels

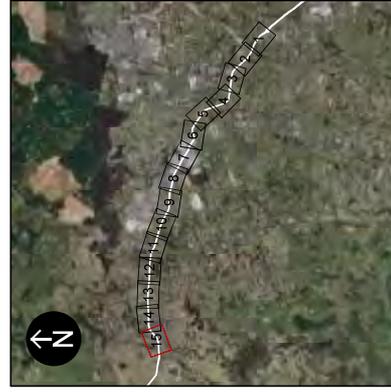
- NZ Primary Road Parcels
- NZ Primary Land Parcels
- Parcels With Land Possibly Required
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Map Scale @ A3: 1:2,500		Revision		Author		Verified		Approved		Date	
5		5		SCP		MCP		SPAS		16/06/2017	
10		4		SCP		DBAFT		DBAFT		17/06/2017	
15		3		SCP		DBAFT		DBAFT		17/03/2017	
20		2		SCP		DBAFT		DBAFT		20/02/2017	
<p>SH16 Bringham Creek to Waimauku Possible Land Requirement - Preferred Option Zones A to E</p>											
Client: NZ Transport Agency						Project: Safe Road Alliance - Core Project					
Discipline: GIS						Drawing No: GIS-3411907-255A Page 14 of 15					



Legend

- SH Distance Markers 500m
- SH Distance Markers 100m
- Possible Driveway Changes Needed

Land Possibly Required (Approximate)

- Permanent Land Requirement
- AT Vested Property
- Additional Temporary Land Requirement

Parcel Types

- NZ Primary Road Parcels
- NZ Primary Land Parcels
- Parcels With Land Possibly Required
- Parcels With Possible Driveway Changes Needed

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Aerial Imagery flown 2015 for Auckland Council.

Map Scale @ A3: 1:2,500 		Revision		Author	Verified	Approved	Date						
		5	4	3	2	SCP	SCP	DB/RT	DB/RT	DB/RT	16/08/2017	17/08/2017	17/08/2017
SH16 Brigham Creek to Waimauku Possible Land Requirement - Preferred Option Zones A to E								Client: NZ Transport Agency Project: Safe Road Alliance - Core Project				Discipline: GIS Drawing No: GS-3411907-255A Page 15 of 15	