Silverdale West Dairy Flat Industrial Area Structure Plan

April 2020

Auckland Council
Te Kaunihera o Tāmaki Makaurau

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1 SUMMARY

The council's strategic direction for growth in Auckland includes the urbanisation of the Future Urban Zone at Silverdale Wainui and Dairy Flat.

The council's Future Urban Land Supply Strategy 2017 identifies part of the Silverdale West Dairy Flat area specifically for business and it is sequenced to be development ready in the period 2018 – 2022.

The Silverdale West Dairy Flat area will become the focus for future light industry growth in the urban north due to the urban growth proposed in the wider area and the imminent exhaustion of light industry zoned land supply in the North Shore, Silverdale and the Highgate Business Park. It will also be the next nearest light industry zone location to urban Auckland.

This structure plan shows how the land can be urbanised taking into account constraints and opportunities. It shows the land uses and infrastructure required to service the land. It also shows how the area connects to adjacent existing and future urban areas and wider infrastructure networks. Important cultural values, natural features and heritage values are also addressed. The structure plan will become the basis for the council-initiated plan changes to achieve operative urban zones.

Figure i shows the Silverdale West Dairy Flat Industrial Area structure plan map.

The key features of the structure plan are:

- light industry with a central area of heavy industry
- existing and an indicative new transport network
- existing and indicative new water and wastewater infrastructure
- indicative open space
- landscape protection measures including landscape buffers and view shafts
- stream areas and floodplains to be protected
- a staged approach to land development.

The structure plan identifies 294ha (net, excludes floodplains and roads) for light industry and 56ha (net) for heavy industry. The area of heavy Industry is located south of Wilks Road. The total structure plan area is 603ha gross, however, once floodplains and roads are deducted the net developable area is 350ha.

By 2048 the additional industrial land demand for the north east will amount to between 156 and 299ha (net) of light industry zoned land and up to 125ha (net) of heavy industry zoned land. It is considered prudent to plan to accommodate near the high end of the range given the difficulties with finding more industrial land once other activities are in place.

While there is a preference for the northern part of Auckland to provide for some heavy industry in the future, it is acknowledged that it is difficult to predict the mix of industrial land needed in 20 years' time. Before a decision is made on the appropriate zoning, the need for land for heavy industry will be reassessed prior to the plan change required to rezone the land in Stage 2 (2038-2048). However, it is still important that the structure plan flags the opportunity now for possible heavy industrial land in the future.

In relation to transport, Te Tupu Ngātahi, the Supporting Growth Alliance, prepared an Integrated Transport Assessment (ITA) in support of the draft Silverdale West Dairy Flat Industrial Area Structure Plan in parallel with the Supporting Growth Indicative Business Case. The Alliance is currently (2020) undertaking a Detailed Business Case (DBC) for some of the projects identified in the strategic transport network for north Auckland's growth areas.

It is important to note that the road, cycling and pedestrian networks shown in the structure plan are indicative and are not committed or funded. They include strategic elements that, were identified in the adopted Supporting Growth Indicative Business case some of which are part of the DBC which is being prepared by Supporting Growth at the time that this structure plan was adopted.

The key elements of the transport network serving the structure plan area are an upgraded and new arterial and collector road network. The new arterials are from Pine Valley Road to the north to the Wainui live zoned area (Milldale) and a new east west arterial between the Wilks Road interchange and the intersection of Dairy Flat Highway and Kahikatea Flat Road. Associated with this is a proposed new motorway interchange at Wilks Road with south facing ramps only.

The structure plan also identifies an extensive walking and cycling network both on and off road. The off-road network is associated with stream and riparian network. It also includes two proposed strategic routes adjacent to the motorway and the proposed Rapid Transit Network corridor.

A public transport network will be developed on the arterial and collector network. A proposed Rapid Transit Network corridor is also proposed through the structure plan area. It will connect the future urban zones to the south and north of the structure plan area to the rapid transit corridor to Auckland.

Water will be provided to the structure plan area initially with a connection from the existing Orewa 1 watermain in the Highgate Business Park. The new water pipeline alignment will cross State Highway 1 (future Highgate Bridge), through the Milldale area, across the Weiti Stream (future Weiti Bridge), entering the structure plan area in the north. This forms the northern part of the Orewa 3 watermain, which will connect water from the North Shore through the structure plan area in the long term.

Within the structure plan area, new wastewater collector pipelines and pump stations are needed, which will connect to the Milldale wastewater system. The wastewater infrastructure in Milldale has been sized to cater for the structure plan area, which connects to a newly constructed tunnel under SH1 (from Wainui Road to Millwater Parkway) and the Orewa Pump Station. From the Orewa pump station, wastewater is then conveyed through existing infrastructure along the length of the Whangaparaoa Peninsular to the Army Bay Wastewater Treatment Plant, where it is treated and discharged to the sea between Army Bay and Tiritiri Matangi Island.

The structure plan identifies riparian margins adjoining streams which will help in stormwater management along with a range of other stormwater management methods. The riparian margins will also protect the main ecological features of the structure plan area. The flood plains are also identified, and development will be avoided in these. A range of other flood mitigation measures will also be used.

Several elements are identified in the structure plan relating to landscape. A view shaft is identified to help protect views from the motorway. Landscape buffers are also identified along Dairy Flat Highway and the motorway, and where the industrial zone adjoins the future urban zone. These are to protect the amenities of the adjoining land uses. A greenways network is also identified based primarily along the stream network which will help contribute to amenity values and break up the perception of a mass of buildings.

The structure plan also includes a staging plan which will determine which land is rezoned first and sets out a timeline for the rezoning of the remainder of the land. Three stages are proposed to align with the projected demand for land and the provision of infrastructure. Monitoring of the uptake of the land will be required to determine the actual timing of the rezoning of the land.

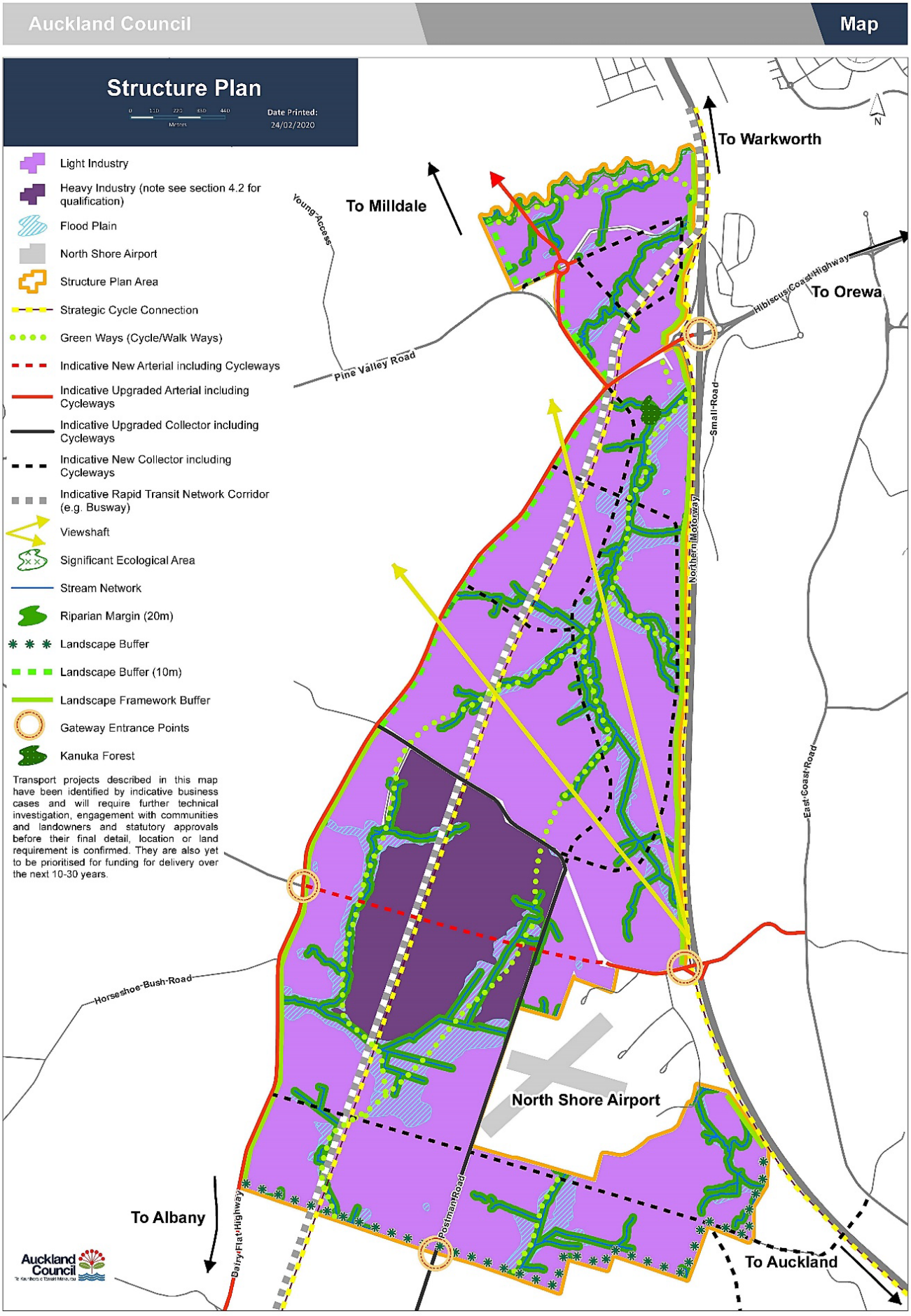

Figure i Silverdale West Dairy Flat Industrial Area Structure Plan

PART A: THE STRUCTURE PLAN

2 STRUCTURE PLAN PURPOSE, AREA AND PROCESS

2.1 Purpose

2.1.1 Auckland's Challenges

Auckland faces the three key challenges of high population growth, ensuring prosperity is shared amongst all Aucklanders, and arresting and reversing environmental degradation.[1] We must address these challenges to achieve the Auckland we want in the future.

Population growth and its implications

Around 1.66 million people currently live in Auckland. Over the next 30 years this number could grow by another 720,000 people to reach 2.4 million [2] (see Figure 1)

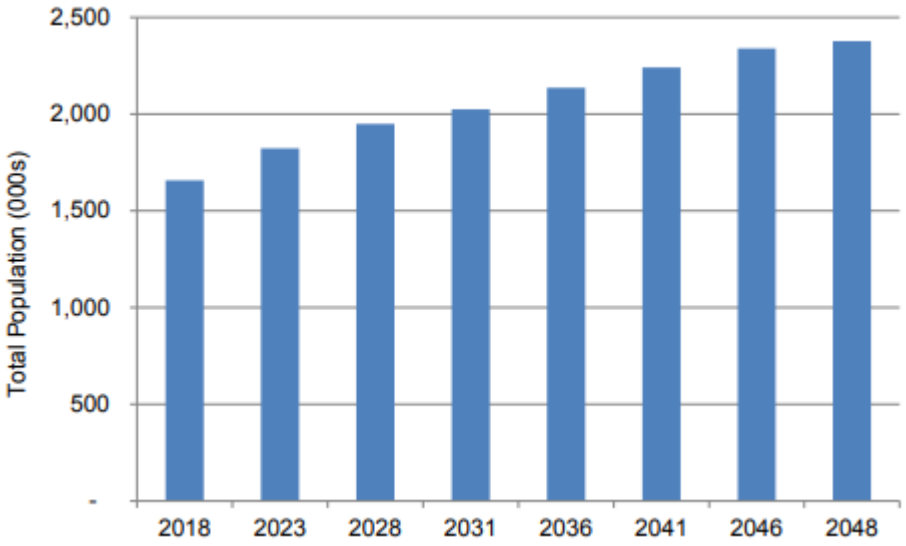

Figure 1 Projected total population in Auckland, at five-year intervals (2018 to 2048, medium series)

Data source: Auckland Council, Land use scenario i11.

The rate and speed of Auckland's population growth puts pressure on our communities, our environment, our housing and our roads. It means increasing demand for space, infrastructure and services. The challenge for Auckland is where people will live and how they will move around.

[1] These are the key challenges set out in the Auckland Plan 2050.

[2] This is based on Auckland Council's Land Use Scenario i11 which is a numerical representation of the future distribution of Auckland's population and households. It has taken into account Statistics NZ's regional population projections released in March 2017, as well as data from the 2013 Census on average household sizes, and information from Auckland Council's Future Urban Land Supply Strategy.

Approximately 313,000 new dwellings and 263,000 additional jobs will be needed to accommodate the growing Auckland population over the next 30 years. The Auckland Plan 2050 anticipates that around 32 per cent of growth will occur in future urban areas and 6 per cent in rural areas. The remaining 62 per cent of development is anticipated to be within the existing urban area. In future urban areas, this means approximately 133,000 dwellings are anticipated and around 1,400 hectares of business land is needed.

Sharing prosperity with all Aucklanders

Auckland's success is dependent on how well Auckland's prosperity is shared. Many Aucklanders are prosperous and have high living standards, yet there are significant levels of socio-economic deprivation, often in distinct geographic areas. As Auckland continues to grow, we need to ensure that all Aucklanders can benefit from the social and economic prosperity that growth brings and can participate in and enjoy community and civic life.

Reducing environmental degradation

Much of Auckland's appeal is based on the natural environment. Despite regulation and considerable effort, Auckland's environment continues to be affected by past decisions and its rapid growth and development, as well as emerging threats such as climate change. Our lifestyles, and how we manage growth and development, will determine whether the nature environment endures and if future Aucklanders can enjoy the environmental benefits we cherish today.

2.1.2 Responding to the Challenges - Wainui, Silverdale, Dairy Flat Future Urban Area

Auckland Council's (council's) strategic direction for growth in Auckland includes the urbanisation of the Future Urban zone at Wainui, Silverdale and Dairy Flat.

The area is identified within the Rural Urban Boundary and zoned future urban in the Auckland Unitary Plan Operative in part (AUPOP). Land in the Future Urban zone has been determined as suitable for future urban development, but appropriate urban zones are needed before urban development can occur.

The wider Wainui, Silverdale and Dairy Flat Future Urban zoned area is approximately 3,500ha extending from Upper Orewa in the north to Dairy Flat in the south. This includes 300ha of urban zoned land at Wainui immediately to the north of the structure plan area. The Silverdale West Dairy Flat Industrial structure plan area is shown in this wider context in Figure 2 below.

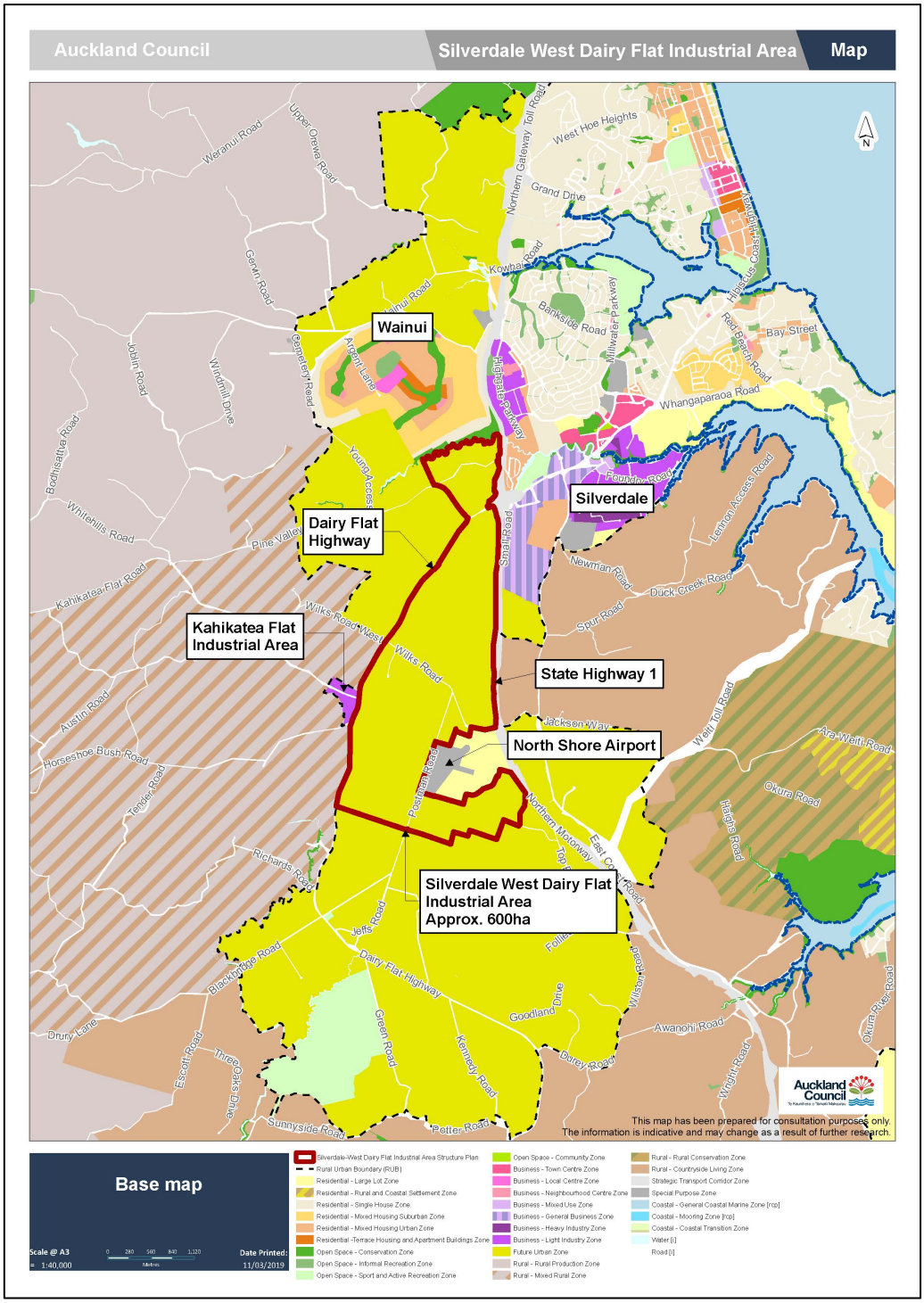

Figure 2 Silverdale West Dairy Flat Industrial Structure Plan Area locality

The Auckland Plan 2012, the guiding document when the structure plan was initiated and through to 2018, indicated that:

> *At least 1,400 hectares of additional greenfields land will be provided for business activities. Approximately 1,000 hectares of this will be for business activities that require large tracts of land (e.g. manufacturing, transport and storage, logistics and*

similar activities),…... A further 400 hectares of land will be provided for commercial activities, such as retail, office and service activities.

The Auckland Plan 2012 therefore identified a greater need for industrial land than it did for other types of commercial land.

The Auckland Plan 2050 (adopted June 2018) sets out a Development Strategy and this specifically addresses business land in future urban areas and indicates that approximately 1,400ha of business land is needed in greenfield areas.

The council's Future Urban Land Supply Strategy 2017 (FULSS) sets out a programme for sequencing the development of future urban land over 30 years across Auckland.

The FULSS identifies part of the Silverdale West Wainui Dairy Flat area specifically for business and it is sequenced to be development ready between 2018 – 2022. "Development ready" means that the land has had a structure plan prepared, is zoned for urban uses in the AUPOP and the necessary bulk infrastructure is available. The FULSS is discussed in more detail in Part B.

On 1 August 2017 the council's Planning Committee agreed that the council should prepare a structure plan for the Silverdale West Dairy Flat Area.

The Wainui Silverdale Dairy Flat area will become one of Auckland's key growth areas in the next 30 years, and that growth will require significant new provision of business land, including industrial and commercial land and other retail and services space, to provide employment and meet the future business and service needs of the growing community. The wider Wainui Silverdale Dairy Flat future urban area will be subject to a structure plan process in the future. This will include identifying the appropriate land uses, including residential areas of varying densities, a town centre, and retail and other commercial activities.

The Silverdale West Dairy Flat area will become the focus for future industrial growth in the urban north due to the extensive future urban land identified in the area. Also, there is the imminent exhaustion of light industrial land in the North Shore, Silverdale and the Highgate Business Park. It is the next suitable area for industry in the north nearest to urban Auckland.

The land is identified for industrial activity because of its proximity to an existing motorway interchange at Silverdale and the existing Silverdale industrial area, it is relatively flat and the southern area is subject to adverse effects from the adjoining North Shore Airport which renders it unsuitable for residential or other more intensive uses.

The Silverdale West Dairy Flat Industrial area is the first in the Wainui Silverdale Dairy Flat area to have a structure plan prepared for it. This is because of the shortage of industrial land highlighted above, the live urban zoning given to the land to the north at Wainui through the Auckland Unitary Plan hearing process and the desirability of providing jobs and services locally.

This structure plan, and the subsequent development of the Silverdale West Dairy Flat Industrial Area, responds to Auckland's three key challenges. It provides a detailed examination of the opportunities and constraints in order to deliver the sustainable development of land for industrial uses and additional jobs.

2.1.3 What is a Structure Plan

A structure plan is the first stage to enable and guide urban development and is a prerequisite to determining appropriate urban zoning.

It is a non-statutory high-level plan that shows how an area of land can be urbanised taking into account constraints and opportunities. It shows the arrangement of various land uses and infrastructure. It also shows how the area connects to adjacent urban areas and wider infrastructure networks. Important natural features and heritage values are also identified.

The structure plan will then become the basis for the council-initiated plan changes to achieve operative urban zones.

2.2 The Silverdale West Dairy Flat Industrial Structure Plan Area

The structure planning process applies to the land area enclosed by the red line in Figure 3. The area is approximately 603ha.

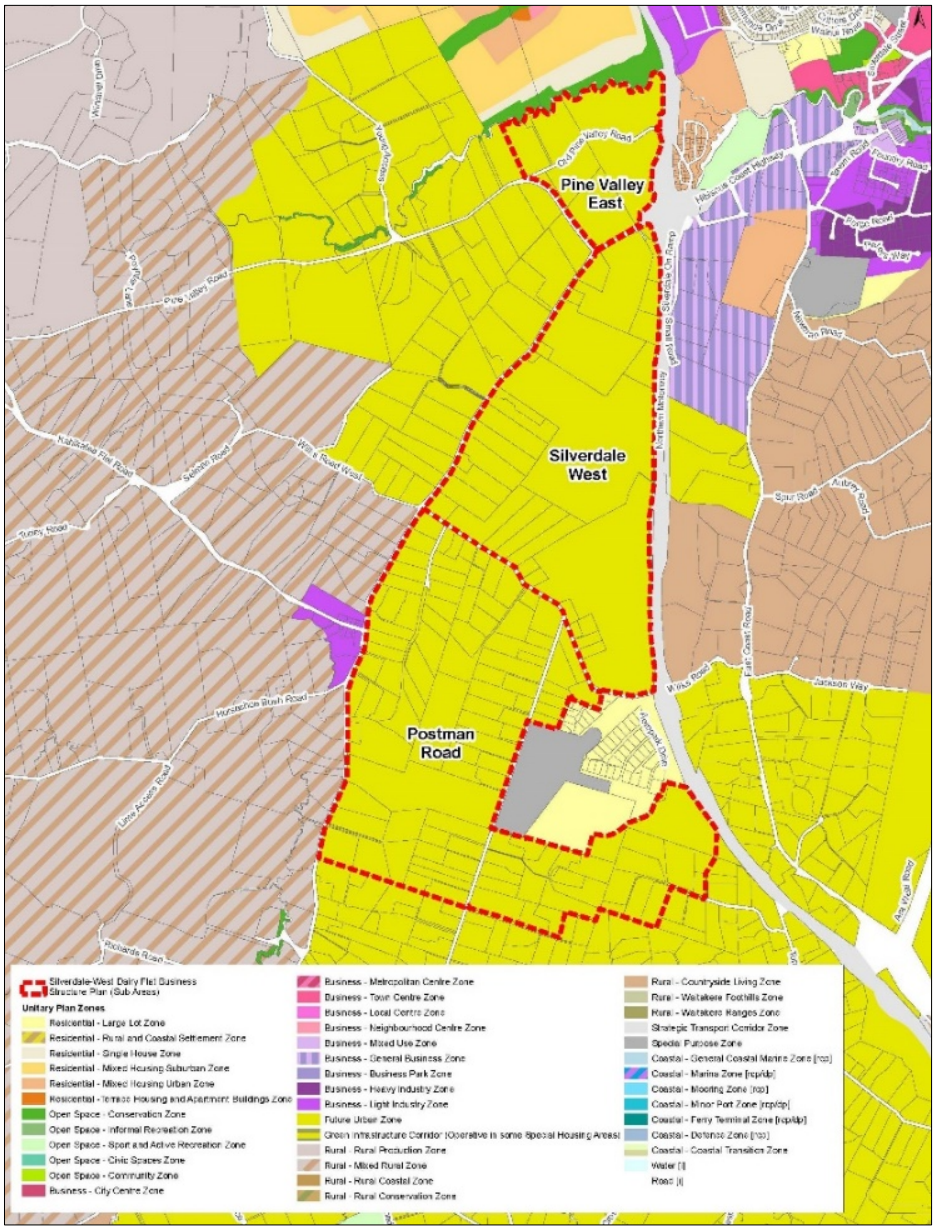

Figure 3 Silverdale West Dairy Flat Industrial Structure Plan Area

This land is located to the west of the State highway 1 motorway from Pine Valley in the north, to the south of the North Shore Airport and west to the Dairy Flat Highway.

It includes the Pine Valley East area in the north, the Silverdale West area in the centre and the Postman Road area to the south. The structure plan area surrounds the North Shore Airport on three sides.

The current land use is predominantly countryside living and some business uses such as a bus depot.

The structure plan area is zoned Future Urban in the AUPOP. The land is also zoned Future Urban to the west of the Silverdale West area, to the east of the airport across SH1, and to the south of the airport. To the west of the Postman Road area across the Dairy Flat Highway, the land is zoned Mixed Rural. There is a small area of industrial zoned land at the Dairy Flat Highway/Kahikatea Flat Road intersection. This reflects a legacy local service area.

2.3 Structure plan process and consultation

The AUPOP sets out the requirements for a structure plan in the Regional Policy Statement and Appendix 1 Structure Plan Guidelines. The structure plan for the Silverdale West Dairy Flat Industrial Area will become the basis for future council plan changes for the area.

This structure plan has also been prepared under the relevant provisions of the Local Government Act 2002, including those relating to consultation.

The process for preparing a structure plan is outlined in Figure 4 below.

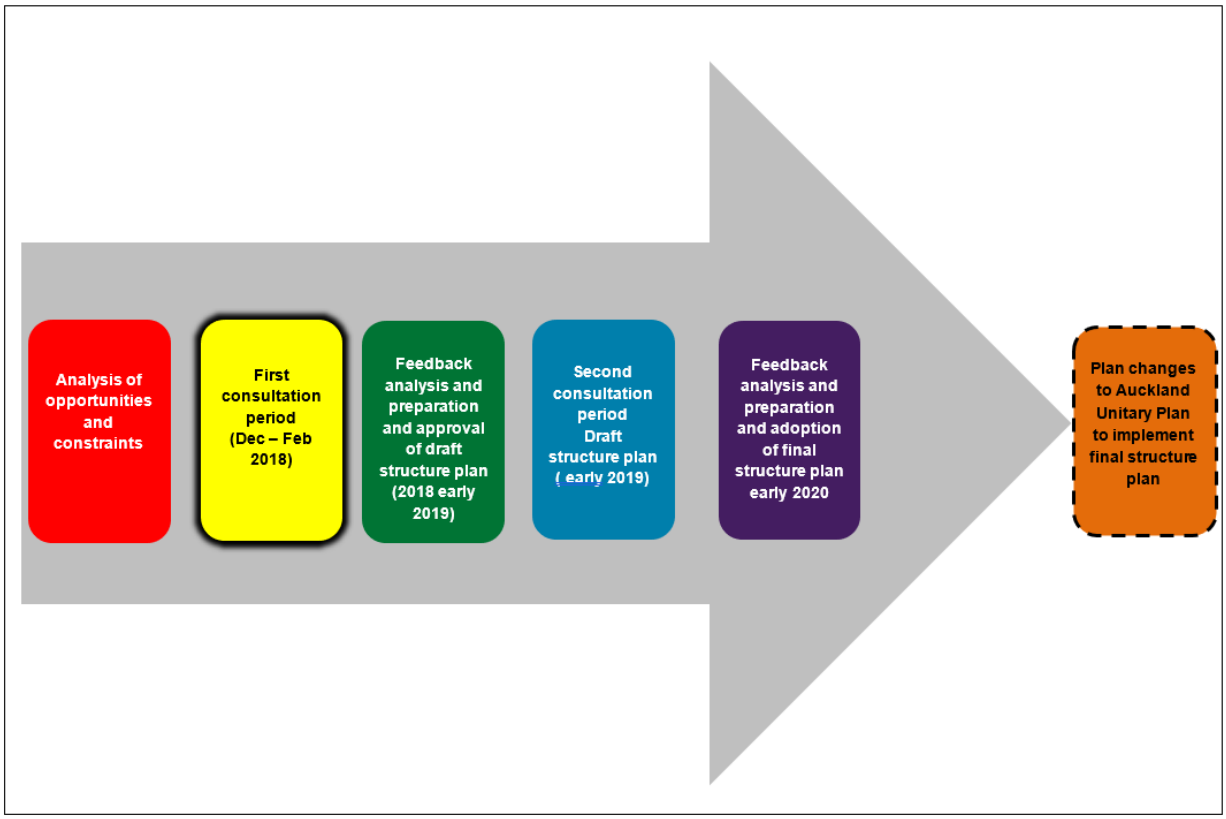

Figure 4 Structure planning process

2.3.1 What has happened to date

Technical research for the structure plan area has been undertaken by internal stakeholders. An initial background report assessing the constraints and opportunities for the area was publicly consulted on between December 2017 – February 2018. The feedback received, in conjunction with the technical research, informed the draft preferred land use option which is set out in the Draft Structure Plan 2019.

Conversations with mana whenua have been ongoing (see section 5.10.1).

2.3.2 Draft Structure Plan 2019

The Draft Silverdale West Industrial Area Structure Plan identified a land use and infrastructure pattern for the structure plan area. It was open for public feedback from 25 March 2019 until 28 April 2019.

Information about the draft structure plan was available online through Have Your Say, where there was also an opportunity to provide feedback via an online form. Information was also displayed at Orewa Service Centre, Albany Service Centre, Orewa Library, and Albany Village Library. There were also two drop-in events at the Dairy Flat Hall in April.

Overall, 203 submissions were received on the Draft Structure Plan. Feedback themes were:

- Support industry/jobs
- Oppose Staging - make all of the area development ready by 2022 as per the Future Urban Land Supply Strategy
- Oppose Heavy Industry
- Need a wider range of land uses – eg commercial/ general business
- Support the transport network
- Support motorway ramps, bring Wilks Road interchange forward / ramps in both directions for all interchanges
- Oppose Rapid Transit Network (RTN) route – feedback refers to RTN as a road
- Support RTN/Public Transport
- Build infrastructure before growth
- Concern about how infrastructure will be funded, find alternative funding sources for infrastructure

The feedback is discussed in more detail and responses are provided in the report entitled, Silverdale West Dairy Flat Industrial Area Structure Plan: Response to Feedback on the Draft Structure Plan 2020, which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

Feedback received through this consultation process was analysed and considered in conjunction with any updated technical information and ongoing mana whenua comment to form the final structure plan.

2.3.3 Next steps in the process

The final structure plan was adopted by the council's Planning Committee on 30 April 2020. This marks the end of the structure plan process.

The council will now commence work on a plan change to give effect to the structure plan by creating operative urban zonings. This will include opportunities for public submissions using the formal processes under the Resource Management Act 1991.

2.3.4 Document Structure

The rest of this document is divided into two sections.

Part A sets out the vison and objectives for the structure plan area and the structure plan. It describes the elements that are shown in the structure plan map.

Part B sets out all the background and explanatory information that led to the structure plan option identified in Part A. It covers the material required to be considered in the AUPOP Appendix 1 Structure Plan Guidelines.

Detailed technical topic reports are listed in Appendix 1 and are available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

PART A: THE STRUCTURE PLAN

3 VISION AND OBJECTIVES

3.1 The vision

A proposed vision and objectives have been developed for the Silverdale West Dairy Flat Industrial Area. These are set out below.

The Silverdale West Dairy Flat Industrial Area provides the wider Wainui Silverdale Dairy Flat future urban area, and the sub-region, with land for industrial activities and services, and industrial employment opportunities which meet current and future demands, in a quality low impact built environment and a quality natural environment.

3.2 Key themes and objectives

Theme 1 – Industry

Objectives

- Provide land for light and heavy industrial activities, in particular, for land-extensive industrial activities, where the character, scale and intensity of the effects from those activities can be appropriately managed.
- Provide industrial land that has efficient access to freight routes.
- Development occurs in a way that promotes the efficient use of land, infrastructure and buildings.
- Development does not result in reverse sensitivity effects that compromise the ongoing operation of the North Shore Airport.

Theme 2 – built environment

Objectives

- A good standard of built environment and quality public space is provided.
- Adverse effects of industrial activity on adjoining land uses and views from the motorway are minimised.
- Open space connections and greenways are provided which break up the massing of development when viewed from outside, and from within, the area.
- The Silverdale West Dairy Flat Industrial Area is a place that respects and celebrates its relationship with mana whenua and protects its historic heritage and character.

Theme 3 - connections

Objectives

- The transport networks respond to anticipated growth by providing efficient, resilient and safe connections, including for freight, within the Silverdale West Dairy Flat

Industrial Area, to the adjoining future residential areas, the North Shore Airport and to the wider Auckland region.

- Frequent, reliable and attractive public transport options are provided in the longer term by enhancing network connections to support the growth in the industrial area along key transport routes.
- Safe, well connected cycle and pedestrian networks provide high amenity linkages between and within the industrial area and to surrounding areas.

Theme 4 –infrastructure

Objective

- Timely and phased public water, wastewater and transport network infrastructure meet the growing needs of the Silverdale West Dairy Flat Industrial Area and integrates with future infrastructure needs of the wider Wainui Silverdale Dairy Flat future urban area.
- Enable the ongoing operation of the North Shore Airport and acknowledge the possible future expansion of the airport.

Theme 5 – the natural environment

Objectives

- Freshwater quality and stream health within the catchment are improved including through restoration of riparian margins.
- The quality of the marine receiving environment is maintained or improved.
- Protect and improve biodiversity.
- A water-sensitive design approach, including grey water recycling, manages water use and stormwater effects, whilst utilising the existing stream network.

Theme 6 – natural hazards

Objective

- The location and form of development minimises natural hazards.

4 THE STRUCTURE PLAN

4.1 Overview

This section describes the key elements of the structure plan that are shown in the structure plan map in Figure 5. Background and explanatory information that led to the structure plan option is described in Part B. Detailed technical topic reports are listed in Appendix 1 and are available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

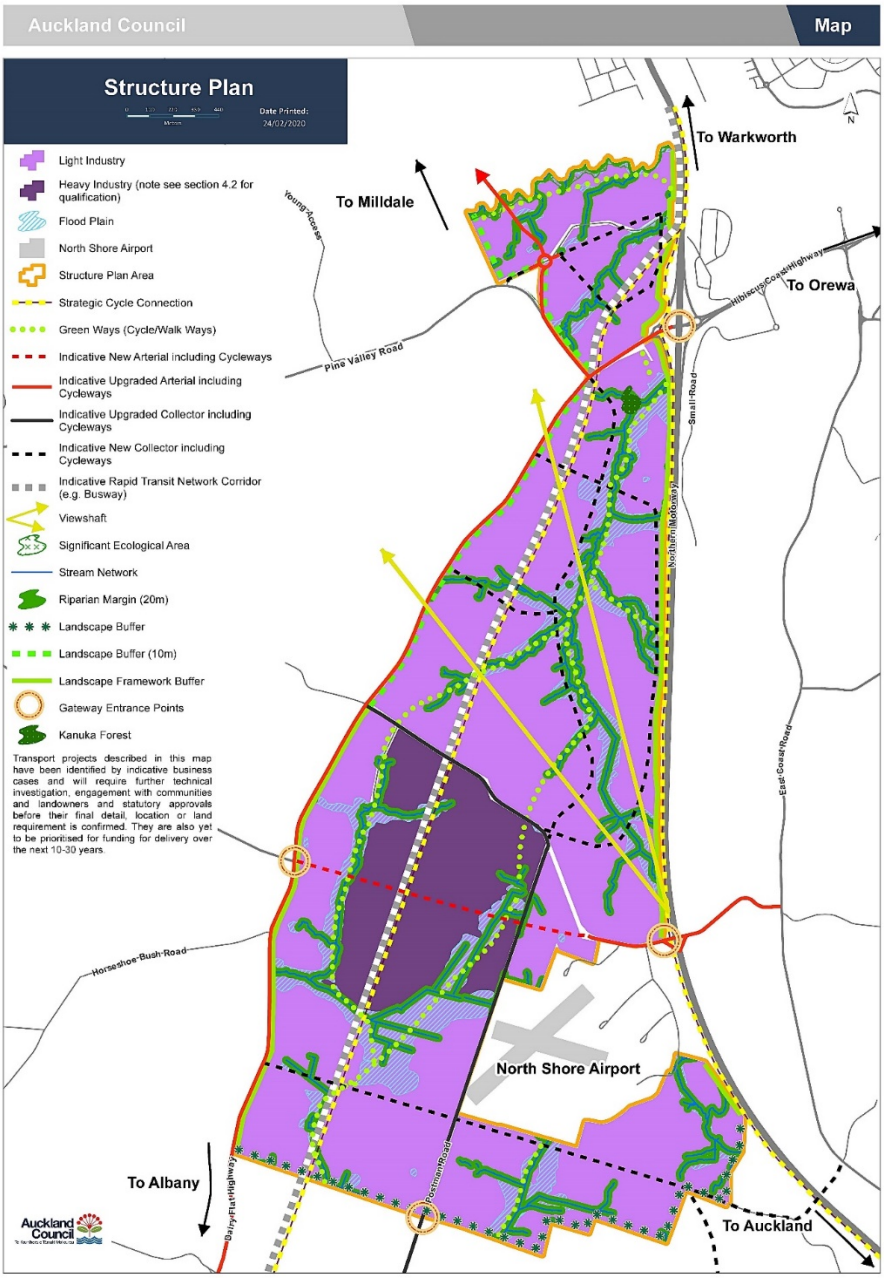

Figure 5 Silverdale West Dairy Flat Industrial Area Structure Plan map

This section describes the land uses, the infrastructure required to service the land, the approaches adopted to address stormwater, landscape, ecological, cultural and heritage issues. It also addresses the staging of the zoning of the land and how infrastructure might be funded.

4.2 Land Use

The key elements of the land use are areas of light industry and heavy industry. Most of the area is identified for light industry.

The total structure plan area is approximately 603ha. However, once floodplains and roads are deducted the net developable area is approximately 350ha. Of this 293ha(net) is identified for light industry with 56ha(net) for heavy industry. The area of heavy Industry is located south of Wilks Road between two flood plains. This has the following characteristics:

- is on the flattest land in the structure plan area
- is buffered from adjoining more sensitive land uses by light industry and by streams
- is accessible to the proposed new arterial and a possible new motorway interchange at Wilks Road.

While there is a preference for the northern part of Auckland to provide for some heavy industry in the future, it is acknowledged that it is difficult to predict the mix of industrial land needed in 20 years' time. Before a decision is made on the appropriate zoning, the level of need for heavy industrial land will be reassessed prior to the plan change required to rezone the land in Stage 2 (2038-2048). However, it is still important that the structure plan flags the opportunity now for possible heavy industrial land in the future.

The industrial component is discussed in more detail in Part B Section 6.1.

The suitability of the land for industrial development is discussed in section Part B Section 6.9.

There are also areas of open space in the structure plan area associated with the stormwater and riparian network.

4.3 Transport

4.3.1 Network Development Planning Process

Te Tupu Ngātahi, the Supporting Growth Alliance, (Auckland Transport (AT) and NZ Transport Agency (NZTA) undertaken in collaboration with and Auckland Council, Manawhenua, and KiwiRail) has undertaken an Indicative Business Case (IBC) to develop the strategic transport network in north Auckland's growth areas. The IBC has been endorsed by the AT and NZTA Boards. The Alliance is now working on Detailed Business Cases (DBC) including more detailed technical investigations for each of the projects in the network. This will lead to a specific route protection process over the next few years to

ensure that the land needed to build and operate the routes in the future is set aside and protected in advance of the transport project being constructed and the land being developed.

The alliance has prepared an Integrated Transport Assessment (ITA) in support of the Silverdale West Dairy Flat Industrial Area Structure Plan.

The ITA refines the IBC's high-level strategic network further to identify the likely form, and staging, of transport infrastructure including arterial, collector roads and walking and cycling paths within the structure plan area.

The purpose of the ITA is to identify at a high-level, the following:

- Arterial and collector road network;
- Active mode network;
- Public transport network including a Rapid Transport Network
- Land use and transport integration considerations and other travel demand opportunities.

The ITA is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

It is important to note that the road and cycling and pedestrian networks shown in the structure plan and the ITA are indicative and are not committed or funded. They include strategic elements that are part of the IBC.
The indicative transport networks shown in the structure plan and the ITA are the preferred outcome at this stage but there may be policy, environmental or infrastructure changes in the future that warrant changes to the transport network. Subsequent ITA's, such as those required at the plan change stage, will review the network and determine whether changes are necessary.

Further detail is provided in section 6.2.

4.3.2 Road Network

The Auckland Northern Motorway (SH1) forms the eastern boundary of the structure plan area providing a nationally strategic route for general vehicles and freight. There is one existing motorway interchange within the structure plan area at Silverdale which has ramps in both directions. There is also one non-interchange connection across the motorway corridor on Wilks Road.

The structure plan (Figure 5) shows the proposed arterial and collector road network. Dairy Flat Highway is an arterial which forms the western boundary of the structure plan area. AT is carrying out a range of safety improvements for Dairy Flat Highway as part of a road safety review and intersection upgrades are committed to occur from 2019.

The key strategic network assumptions arising from the IBC and informing the transport network development within the Structure Plan area are:

- A new motorway interchange is to be provided at Wilks Road with south facing ramps only
- a new east west arterial between the Wilks Road interchange and the intersection of Dairy Flat Highway and Kahikatea Flat Road.
- Penlink, with north and south facing ramps

At the Wilks Road interchange only south facing ramps are proposed. Traffic from the north can access the structure plan area from the Silverdale Interchange. This arrangement is based on analysis of traffic demands and its distribution. A balanced approach between providing new access to the motorway and maintaining the safety and efficiency of the motorway network for strategic and longer distance users has been taken.

The structure plan also identifies a proposed road network to support the Silverdale West Dairy Flat Industrial Area. The collector road network is indicative and will be refined as part of the plan change process. In summary, the key features of this proposed network are:

- use of a combination of existing roads e.g. Postman Road, and the northern part of Wilks Road, and new roads such as those in the Silverdale west area and the roads south of the airport.
- it responds to the flood plain riparian corridor that routes north-south through the area by avoiding multiple crossings of this corridor. The road is aligned next to the corridor so that any public space provided along the corridor, e.g. walking and cycling paths, is overlooked by a road rather than the back of industrial buildings.
- the collector road adjacent to the motorway has been aligned next to the landscape buffer along this boundary as the green corridor would also support public walking and cycling networks, and it is preferred that these are overlooked by roads.
- it seeks to avoid an area of kanuka and exotic forest recommended for restoration and a wetland also identified for restoration in the northern part of the structure plan area[3] (but south of Dairy Flat Highway).
- it seeks to minimise the number of intersections on Dairy Flat Highway in Pine Valley East, but this may change if modelling indicates that additional collector road access into the structure plan area is necessary.
- the industrial area to the north of Dairy Flat Highway has one collector road connection to the arterial network to avoid having multiple intersections close to the motorway interchange.
- a network of indicative pedestrian and cycle paths following the ecological corridors and connecting to the wider network has been identified in the ITA and this has informed definition of the road network, but these are not part of the transport modelling assessment in the ITA.

Indicative cross sections for the arterial and collector roads are shown in Part B.

[3] Silverdale West Structure Plan Ecological Constraints Analysis, Golder Associates

Additional local roads will be needed but these are not defined in the structure plan and are generally identified in subsequent ITA's and provided as land development occurs.

4.3.3 Proposed Cycling and Pedestrian Network

The ITA identifies a proposed cycling and pedestrian network and includes strategic walking and cycling routes identified in the IBC by Te Tupu Ngātahi for the north Auckland growth areas.

The structure plan map in Figure 5 shows the part of the local cycling and pedestrian network located in the open space network as the rest of it is located on the roads. It also shows a proposed strategic cycle network adjacent to the motorway and the proposed RTN. The full cycling and pedestrian network in shown on Figure 11 in Part B.

The off-road pedestrian and cycle paths present an opportunity to utilise flood risk areas that cannot be built on and support travel to and from work as well as recreational travel by active modes.

The indicative pedestrian and cycle network have been developed based on key principles of:

- utilising local level opportunities presented by the site, e.g. routes through riparian margins
- achieving connectivity through and within the structure plan area
- providing safe facilities on road corridors to support active travel modes and reduce conflict and crashes.

Design details, such exactly where the paths are located within the riparian and flood areas and intersection treatments will also be defined at later stages of the planning and development process. As part of this, it will be important to consider how the design of the network and facilities can support an increase in cycle use, along with emerging or future modes, such as electric bikes and e-scooters. Also, as part of this, consideration of design methods such as where routes are located within flood zones will need to be considered, e.g. raised boardwalks.

The strategic parts of the cycling network are intended to serve through movements as well as providing access to and from the structure plan area. For example, the off-road route alongside the motorway is likely to be of equal or more benefit for through movement between areas around the structure plan area as it is for visitors to sites within it. There may be opportunity to integrate this route with the proposed landscape buffer to enhance user amenity. The same would apply to the route along Dairy Flat Highway and that proposed adjoining the RTN.

4.3.4 Proposed Public Transport Network and Rapid Transit Network

The arterial and collector road network provides routes for public transport. Possible routes are outlined in detail in Part B section 6.2. The routes essentially connect the industrial and employment structure plan area with Wainui, Silverdale and Orewa in the north and the Dairy Flat future urban growth area in the south, including a likely new town centre.

AT has provided indicative information on how the local bus network might look in this area and more detail is provided in the ITA. Currently this includes three potential local bus routes as follows:

- A frequent route via the Silverdale West industrial area between a possible new centre in the southern Dairy Flat Future Urban Zone, the new Wainui centre (Milldale), and Silverdale. This route would provide good connectivity between the wider network and the industrial area.
- One route from Orewa in the north, through the northern FUZ area to Wainui centre, then down through the industrial area to suburban Dairy Flat in the south
- A local route via the edge of the industrial/urban area, along the existing Dairy Flat Highway between the Silverdale centre and the possible new Dairy Flat centre.
- Assuming such local routes eventuate, there will be good connections between the Silverdale West Dairy Flat industrial area and the wider Wainui Silverdale Dairy Flat area.

The Supporting Growth IBC investigated options for an RTN in north Auckland. A possible RTN route is identified in the structure plan area. At this stage this is very indicative, and the location will be refined as further detailed investigations occur through the DCB process.

The route extends south to north through the structure plan area from the southern Dairy Flat Future Urban zone to the Milldale residential area further north. The RTN is a dedicated public transport facility (eg a busway or light rail) which is recommended to be staged. An RTN provides fast, frequent, high capacity public transport services along corridors that are separated from general traffic and therefore unaffected by road congestion.

The new RTN route is proposed to connect to the current RTN (busway) at Albany and will divert from SH1 at Redvale to service a possible new town centre in the Dairy Flat area (located outside and to the south of the structure plan area).

There could be two transport stations on the RTN servicing the structure plan area, but the locations will not be defined until much later and will be subject to further planning and business case processes. The RTN route is likely to be protected through a separate route protection process. In the short to medium term bus priority improvements on SH1 will continue to service current demand.

As noted above, the Alliance is working on Detailed Business Cases (DBC) including more detailed technical investigations for the RTN.

The expected timing of the release of the land and the draft staging recommended for the RTN mean that it may not be delivered before most of the structure plan area is built out,

however, as noted above, the route will be protected ahead of time. Frequent bus services with on road priority will therefore likely be necessary in the short to medium term to support land development within the structure plan area. These local services will still be required after the RTN is operational, to shift passengers to and from the RTN stops to destinations within the structure plan area and beyond.

4.4 Wastewater

There is currently no reticulated wastewater network in the structure plan area.

To service land in the structure plan area north of Wilks Road, two new pump stations and the associated pipelines are needed within the structure plan area, these will connect to a new rising main on the proposed Weiti Bridge and then the Milldale wastewater system. To service the structure plan area south of Wilks Road, an additional pump station and associated pipelines will be required. The timing for delivery of the new pump stations will be driven by development demand.

The wastewater infrastructure currently being constructed in Milldale has been sized to cater for the structure plan area, which connects to a newly constructed tunnel under SH1 (from Wainui Road to Millwater Parkway) and the existing Orewa Pump Station. From the Orewa pump station, the wastewater will be conveyed through existing infrastructure along the length of the Whangaparaoa Peninsular to the Army Bay Wastewater Treatment Plant, where it is treated and discharged to the sea between Army Bay and Tiritiri Matangi Island.

The rising main on the proposed Weiti Bridge and the Milldale wastewater system provides a bulk wastewater connection point for the structure plan area and it is planned to be in place by 2022.

Staged upgrades of the main wastewater conveyance network from the Orewa Pump Station to the Army Bay WWTP will also be required to accommodate future growth demands, however, this is not a prerequisite for the release of the structure plan area.

The Army Bay Wastewater Treatment Plant (WWTP) is located on the eastern end of the Whangaparaoa peninsula, near Shakespear Regional Park and the Naval base. A project to upgrade the outfall capacity at the Army Bay WWTP was completed in 2019. Watercare also obtained a 35 year discharge consent for the Army Bay WWTP in 2019, which enables treated wastewater to be discharged from the existing urban area, plus Wainui, the Structure Plan area and the surrounding future urban zone land in Dairy Flat.

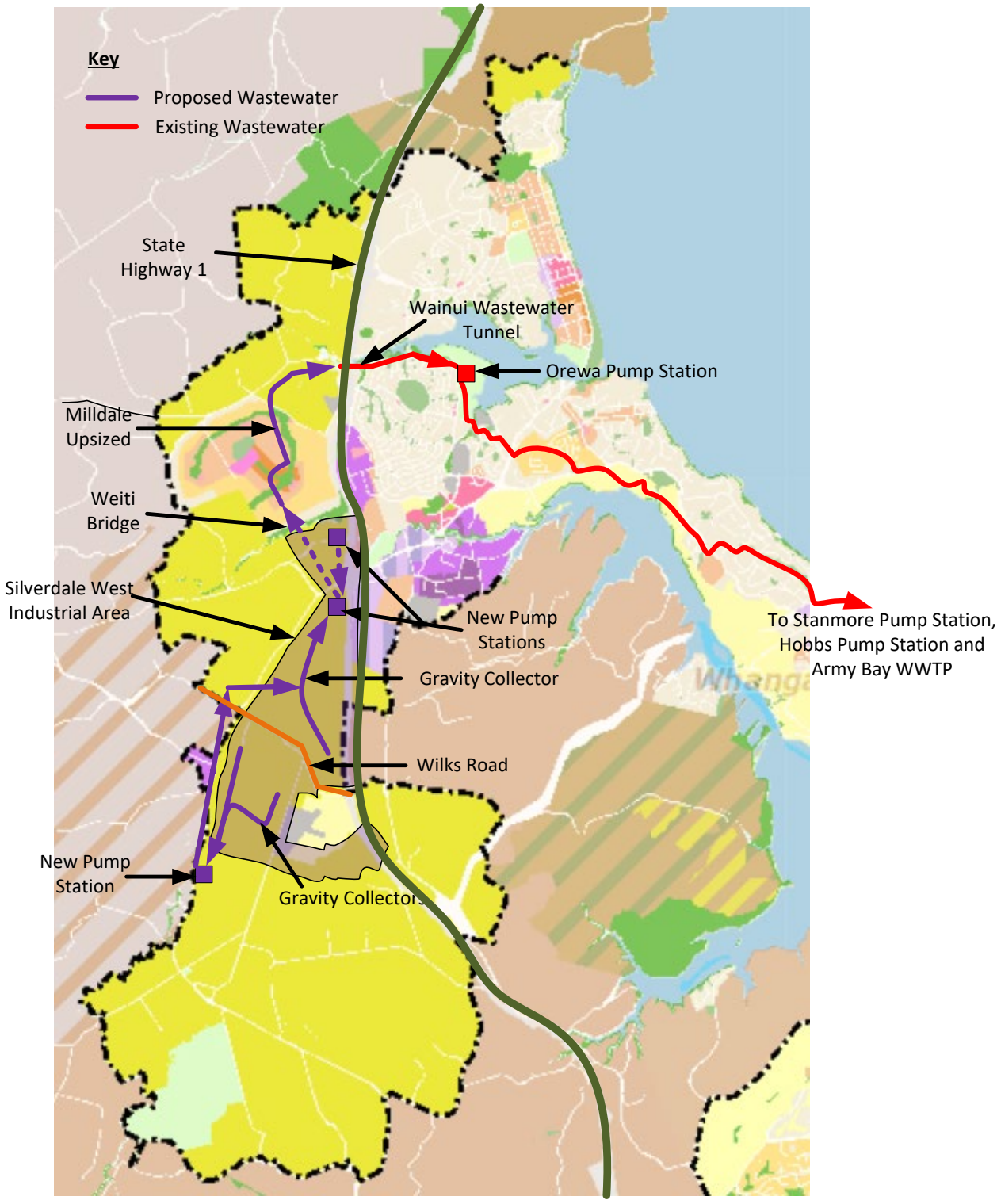

Figure 6 Wastewater network extension

Local networks will be constructed by developers to service development as staging is determined.

More detail is provided in section 6.3 and the Water and Wastewater Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

4.5 Water supply

There is currently no reticulated water supply to the structure plan area.

The current trunk water supply to the Hibiscus Coast area is via the Orewa 1 and Orewa 2 watermains which are both routed along East Coast Road from the Glenvar Reservoir on the North Shore.

To service land in the Structure Plan area, a new bulk watermain will be constructed. This will connect from the Orewa 1 watermain in the Highgate Business Park across SH1 (future Highgate Bridge), through the Milldale area, across the Weiti Stream (future Weiti Bridge) and into the Silverdale West Industrial zone. This forms the northern part of the Orewa 3 watermain in the long term.

A component of the pipeline within the Milldale area has already been constructed and the timing for the remainder is dependent on delivery of the Highgate and Weiti bridge projects. However, it is anticipated the bridges and complete pipeline will be in place prior to 2022.

For long term development of the Structure Plan area and the Future Urban Zoned land, the following upgrades are needed:

- A new booster pump station located on the Orewa 2 watermain.
- A new Orewa 3 trunk watermain from Albany or Schnapper Rock reservoirs (south) which will pass through the Silverdale West Industrial area on its way north to Orewa and the Whangaparaoa Peninsula.
- New reservoir storage to supplement future localised growth and trunk operation.
- Abandonment of the existing Orewa 1 watermain.

A concept for future servicing of the Silverdale West Dairy Flat Industrial Area is summarised in Figure 7.

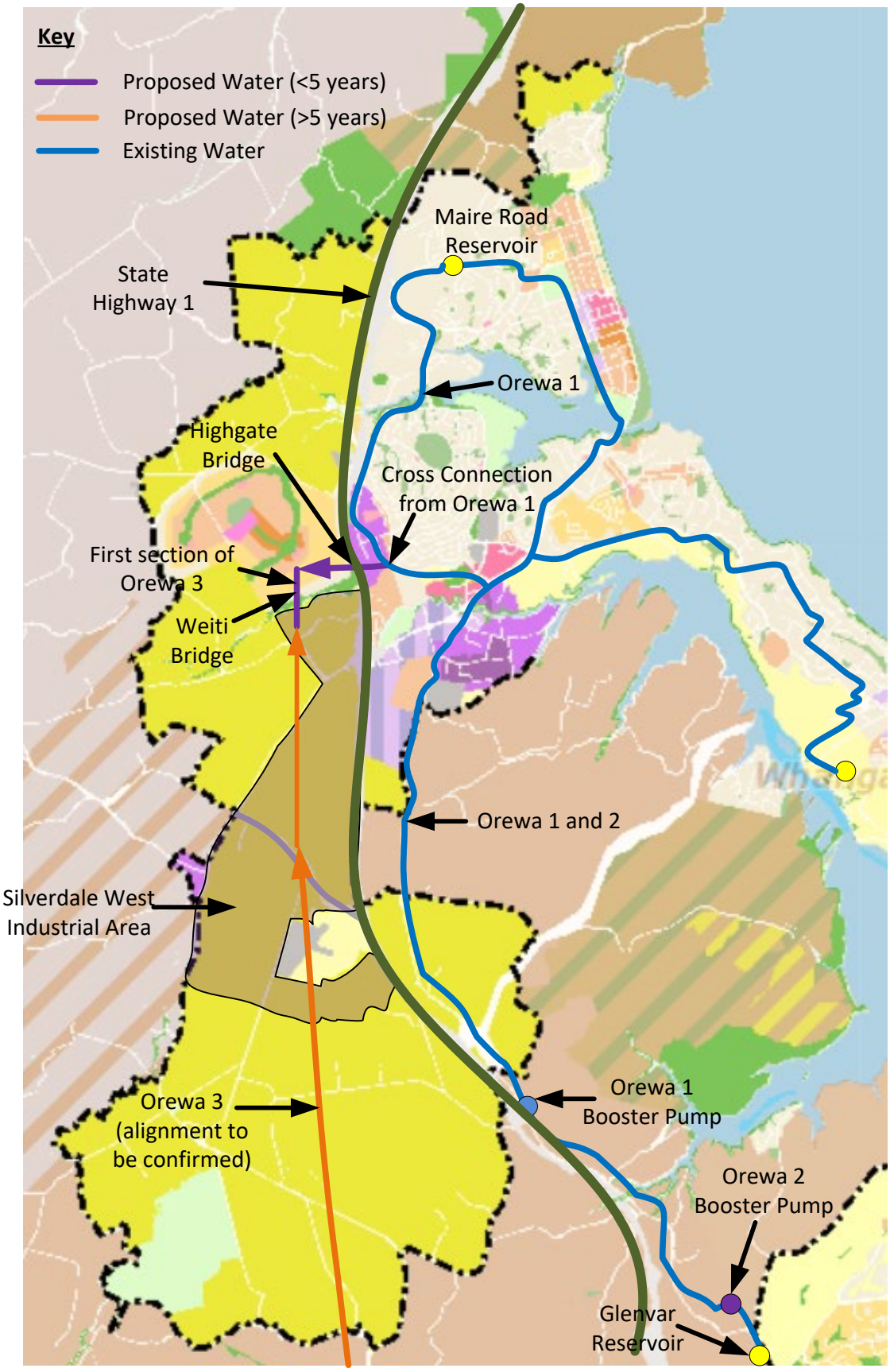

Figure 7 Water servicing

Local networks will be constructed by developers and supplied from these new BSPs to service development as staging is determined.

More detail is provided in section 6.4 and the Water and Wastewater Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

4.6 Natural Character, Landscape and Visual Effects

The change in land use from rural to industrial will have a significant impact on the visual experience of people living in the area and those travelling on SH1 and Dairy Flat Highway. The critical matters to address from a landscape perspective are the interface with SH1 and Dairy Flat Highway; the relationship with land uses outside the structure plan area; and the need to visually 'break up' the appearance of development, particularly when viewed from an elevated perspective.

More detail is provided in section 6.6 and the Landscape Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

4.6.1 Green links

The structure plan identifies the existing natural features (stream network including floodplains, remnant native vegetation (kanuka stands, Weiti SEA and remnant wetland)), and green links which can be protected and enhanced to contribute to amenity values. These are shown on the structure plan and provide a landscape framework within the industrial area which will serve to break up the perception of a mass of buildings in elevated views from the surrounding area and contribute to the delivery high quality amenity values within the structure plan area.

The stream network and floodplains are also significant components of the stormwater management network, have significant potential for ecological restoration and for the future provision of walkways and cycleways. To facilitate these synergies, an integrated approach is adopted. Methods for the protection of these areas and their enhancement through ecological restoration, including the provision of green links and how best cycling and walking facilities can be provided with them, need to be carefully considered. Such measures will significantly enhance the quality of the landscape amenity within the structure plan area and improve the outlook for visual audiences outside the structure plan area. Breaking up the perception of building mass can be further achieved through assessment criteria requiring landscape treatments in front, side and rear yards. Care will need to be taken to ensure that landscape planting achieves the outcomes sought whilst not adversely impacting on the efficient and safe functioning of the local road network or the operation of the North Shore Airport.

4.6.2 Viewshafts

The structure plan shows a viewshaft located immediately north of the Wilks Road overbridge, looking northwest towards Lloyds Hill. The area within the viewshaft is highly visible from SH1 and to residents on East Coast Road with views overlooking the structure plan area. The introduction of assessment criteria (by way of a future plan change) can ensure that a degree of visual amenity is achieved for these external audiences and for audiences within the structure plan area itself. The criterion should require consideration of the effects of proposed buildings and plantings on the character and quality of the outlook in the viewshaft. To avoid the perception of a continuous mass of buildings within the outlook, planting should be used along the SH1 frontage, to create greenways (treed avenues) along the proposed road network, and in yards (front/side/rear). Other measures include specifying standards for building materials, finishes, roof profiles, roof colours and controls on signs.

4.6.3 Buffers

The structure plan shows landscape buffers fronting the SH1 and Dairy Flat Highway boundaries. These will assist to mitigate adverse effects on the landscape and visual amenity values of the surrounding area arising from the changing land use to industrial. Two specific outcomes are sought:

- Protection of the amenity values of the Mixed Rural zone that is opposite the structure plan's Dairy Flat Highway boundary. To do this, a 20m buffer is identified in the structure plan;

- Creation of attractive gateways from SH1 /Silverdale Interchange and Dairy Flat Highway. To do this, a 40m buffer to SH1 and a 10m buffer to Dairy Flat Highway are identified.

While the overall goal is a 40m buffer along the motorway, there are situations where the landform, such as banks and hillocks, and existing planting obscure views of the area from the motorway. Therefore, it may be possible to amend the 40m landscape buffer along State Highway 1 where existing unmodified land form features, existing protected vegetation on private land, or consented landscape planting, provides an effective visual screen that mitigates to the same extent adverse visual effects of industrial development from views from the motorway as a 40m landscape buffer.

The structure plan shows interface buffers on the structure plan's western boundary to Pine Valley East, and to the southern-most boundary where it directly adjoins land zoned Future Urban. It will be important that the building and planting design of the sites which host the buffer fully take into account the adjoining Future Urban zones unknown future mix of urban land uses (including residential and open space zoning), future access requirements and the potential for reverse sensitivity effects.

The commercial area at the junction of Kahikatea Flat Road and Dairy Flat Highway, and North Shore Airport are existing commercial areas that also need to be considered. Design criteria should be applied to sites within the structure plan area that face/adjoin these

businesses including the rural residential land uses around the airport. These criteria should consider how buildings and planting are designed to relate positively to them whilst ensuring that planting does not adversely affect the operation of the Airport.

4.6.4 Gateway Entrance Points

The structure plan identifies the arterial road entry points into the structure plan area. At these points there needs to be a legible ‘gateway’ that creates a feature to inform people that they are entering the industrial area. These gateways should be designed to ensure that transport outcomes for accessibility and wayfinding are integrated with the visual amenity outcomes sought by the Structure Plan.

4.7 Ecology

The following sections address the terrestrial and aquatic environment. More detail is provided in section 6.7 and in the Ecology Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

4.7.1 Terrestrial environment

Very little original natural land cover remains in the structure plan area with the majority being cleared for pastoral land use. Remaining native vegetation includes riparian vegetation bordering the Weiti Stream in Pine Valley East, two small stands of remnant native kanuka forest in the northern most corner of Silverdale West, and naturally occurring wetland in Silverdale West.

The structure plan seeks to retain the existing remnant native vegetation and establish new areas to create an attractive industrial landscape and protect ecological values. The pattern of the stream network needs to be restored through riparian planting to provide benefits to both terrestrial and aquatic ecosystems, creating ecological connections spread across the structure plan area from north to south and west to east. The structure plan also shows greenways connecting the upper reaches of the different stream catchments, creating a continuous riparian network which would maximise the ecological outcomes.

Development proposals will need to demonstrate how their design contributes to positive ecological outcomes requiring designs that:

- recognise and respond to the remaining remnants of native vegetation to protect or enhance their ecological values
- recognise the habitat values of the remaining remnants of native vegetation
- recognise the ecological opportunities presented by riparian restoration along the stream network
- contribute to the success of the North West WildLink ecological corridor.

Prior to a plan change, it will be necessary to carry out an investigation to determine if there are any notable trees worthy of protection within the structure plan area.

4.7.2 Aquatic environment

John Creek located in Silverdale West is the main stream in the structure plan area. It drains to the Weiti Stream and ultimately to the estuarine environment of the Weiti River, Karepiro Bay and Long Bay Ōkura Marine Reserve. These are identified in the AUPOP as significant ecological areas (both terrestrial and marine) and categorised within the most ~~a very~~ sensitive of receiving environments in the country. The Pine Valley East section of the structure plan is also drained by tributaries of the Weiti stream. The area south of Wilks Road drains to the south to the upper catchment tributaries of the Rangitopuni and Dairy Streams.

The development of the land from rural to industrial use provides an opportunity to improve the state of the stream network from the cessation of farming activity, in particular the removal of livestock. This improvement can be consolidated through development proposals being required to provide a comprehensive stormwater design that outlines measures for retaining and restoring the stream network. The following design measures will be required as part of a comprehensive stormwater approach:

- use of ecologically sensitive infrastructure.
- location and design of stormwater infrastructure to contribute positively to stream health, aquatic habitat, in a manner that maintains water quality and flow rates to levels that are consistent with a healthy stream environment.
- provision is made for fish passage within and downstream of the structure plan area and the removal of barriers to fish passage (fallen willows, weeds, broken or inappropriate culverts)
- removal of existing farm ponds (priority to removing ponds close to headwaters), farm drains and culverts with a view to returning (as practicable) the stream network and drainage patterns to a natural state.
- restoration planting incorporated into the stormwater network design e.g., along riparian margins and as part of ponds raingardens and esplanade reserve, and associated cycle/walkways.

These measures have the potential to reinstate drainage patterns to a natural state and to improve instream aquatic habitat and reinstate conditions enabling the upstream migration of fish from the Weiti River catchment.

Development of future land uses in the structure plan area will also introduce new risks of contamination to the aquatic environment within the structure plan area and the sensitive estuarine environs of the Weiti River, Karepiro Bay and Long Bay Ōkura Marine Reserve. Sediments, impervious surface runoff and workplace toxins, such as heavy metals, will need to be managed with a view to creating and then maintaining a healthy natural stream environment and aquatic habitat.

4.8 Stormwater, Flood Management and Water Quality

Structure planning provides an opportunity to holistically integrate and manage stormwater and water quality. Some existing constraints can not only be mitigated but improved upon through water sensitive design. There is generally poor existing stream ecology, erosion, and water quality due to heavy modification in the area through farming. Streambank erosion in particular is an existing issue which could be exacerbated through development if not appropriately mitigated.

A Stormwater Management Plan (SMP) has been developed for the structure plan area. This SMP supports the structure plan however further SMP's will be prepared for more advanced stages of planning such as at the plan change (live zoning) and subdivision (land development) stages.

More detail is provided in section 6.5 and the Stormwater Management Plan which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

4.8.1 Stormwater and water quality

The stormwater drainage network within the structure plan area is predominantly natural channels with minimal existing infrastructure other than culverts under roads and several stormwater ponds adjacent SH1. Future development provides an opportunity to improve the quality of stormwater discharging into the sensitive receiving environment.

As the area develops the existing stream corridors will change from rural streams to functional urban waterways. Ultimately runoff from the structure plan area drains to the Hauraki Gulf (via Weiti Stream) and Waitemata Harbour (via the Rangitopuni Stream).

Applying water sensitive design in the structure plan area is proposed. Approaches include:

- Retain and enhance permanent and intermittent streams that includes the extent of the floodplain.
- Include provision of riparian buffers along watercourses (revegetation/planting allowing stormwater runoff to be filtered and slowed). A minimum 10m riparian margin will be provided either side of intermittent streams and a minimum 20m riparian margin will be provided either side of permanent streams.
- Riparian buffers will also act as green links, providing wildlife corridors as well as recreational opportunities (e.g. cycling and walking)
- Use of stormwater management devices and methods (retention and detention, swales, permeable pavement)
- Minimising the generation and discharge of contaminants (robust runoff management required, including control on roofing materials)
- Reducing earthworks by utilising natural topography and using natural hydrological features
- Protect and enhance existing wetland areas of value.
- Specific watercourse management responses (e.g. Weiti Stream) and hydrology mitigation at development stage (e.g. retention and detention of stormwater).

- Preparing the stream corridor to receive increased flows from an urbanised catchment (critical to protect against erosion and to attenuate stormwater runoff) - this may include enhancement planting around intermittent and permanent streams in headwater locations, or harder interventions such as rock armouring or bank shallowing where high flows are anticipated. Mitigation may need to occur outside the structure plan area.

4.8.2 Flood management

The structure plan area contains large floodplains. These are the Silverdale South and Pine Valley Catchments Floodplain, and Dairy Stream Catchment Floodplain. The floodplains are a constraint to development. Proposed approaches to manage flood risk include:

- Development is avoided within a floodplain.
- Interventions to reduce the impact of flooding (e.g. culvert and bridge upgrades, channel widening, flood storage)
- Overland flow paths to be accommodated as an integrated part of development
- Mitigating the effects of increased flood risk to existing downstream properties (including outside of the structure plan area). This may include communal or on-site attenuation.
- Mitigating the effects of increased flood risk to existing infrastructure (e.g. specific culvert upgrades, upgrading stormwater management ponds, communal or on-site attenuation)
- Understanding and responding to flooding matters for the wider Future Urban Zone, rather than the structure plan area in isolation.
- Potential to reduce the extent of the floodplain (width) in some areas via interventions (e.g. upgraded culverts, earthworks, stream naturalisation). However, this may be at significant cost.

4.9 Cultural Values

The structure plan has been informed by contributions from mana whenua, this includes relevant Iwi Management Plans, comments received at hui and through other channels, and a Cultural Values Assessment (for the Supporting Growth project relating to Wainui Silverdale Dairy Flat) prepared on behalf of Ngāti Manuhiri.

Ngāti Manuhiri, Ngāti Rehua, Te Kawerau ā Maki, Te Rūnanga o Ngāti Whātua, and Ngaati Whanaunga expressed an interest or have been involved in the structure plan process.

Cultural values are discussed in Part B section 6.11. Section 6.11 provides the context to the structure plan's response (below) to these values. Cultural values have been grouped into land, water, biodiversity, and social, economic and cultural wellbeing. More information on these topic areas can be found in the relevant topic sections.

4.9.1 Land

Archaeology

There is a Māori canoe portage and overland walking route located in the north of the structure plan area adjacent the Wēiti Stream. The precise location cannot be defined. As part of a network of green connections a 20-metre esplanade reserve is proposed adjacent to Wēiti Stream. This esplanade will allow greater connections to the Wēiti Stream for people to enjoy, with the possibility of providing information signage (or other) to reflect Te Taruna's historic significance, while preventing development in this area and compromising its cultural significance.

Landscape

The landscape will be modified through earthworks and buildings. Accordingly, a landscape concept plan has been formulated to appropriately manage effects from development. This is discussed in detail in sections 4.6 and 6.6 and includes the following:

- landscape buffers
- a cohesive framework of floodplain and riparian areas for stormwater management, open space, and landscape amenity
- the maintenance of a key viewshaft from SH1 to the hills beyond (Lloyds Hill environs)
- restoration of riparian margins
- retention of existing native vegetation features
- greenways

4.9.2 Water

Stormwater

Structure planning represents a significant opportunity in greenfield development to integrate and manage stormwater as part of the environment as a whole. The receiving environments of the Wēiti River, Hauraki Gulf and the Rangitopuni Stream and Waitematā Harbour are protected and are of high value.

A Stormwater Management Plan (SMP) has been prepared for the structure plan area. This SMP is a high-level document, reflecting the start of the development process.

The structure plan has incorporated the SMP in the following ways of relevance to iwi:

- Identified a green network to protect, conserve and link stream corridors as open spaces
- Creation of riparian buffers on all permanent and intermittent streams
- Using 'Water Sensitive Design' methodology
- Recommending mitigation requirements regarding the increased risk of flooding (affecting property and infrastructure)

The structure plan map indicates that where there is a floodplain this land will not be zoned for urban use. Instead the floodplain will remain largely intact, although there is potential to reduce the width of the floodplain in a few places.

More detail is provided in sections 4.8 and 6.5, and in the Stormwater Management Plan which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

4.9.3 Biodiversity

Vegetation, terrestrial fauna, and aquatic environment and fauna

The structure plan proposes a green link, including landscape buffering of 10m-40m in width at various locations through the structure plan area. Riparian margins of a 20-metre width are proposed at the border of all floodplains. Establishing a more cohesive green network also creates a link to the North West Wild-link ecological corridor, which aims to maintain and enhance natural habitat to act as 'stepping-stones' for wildlife to move between the conservation hotspots of the Hauraki Gulf Islands and the Waitākere Ranges.

The road network seeks to avoid an area of Kanuka and exotic forest, and a wetland identified for restoration in the northern part of the structure plan area.

Stormwater management will also provide opportunities to improve stream health and improve fish passage. More detail is provided in sections 4.7 and 4.8 and 4.12.

More detail is provided in section 4.12 and in the Biodiversity Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

4.9.4 Social, economic and cultural wellbeing

The structure plan area will provide the population of north Auckland with more employment opportunities and greater opportunities to work closer to home. Sustainable transport options will be provided as part of the development of the industrial area. This includes walkways, cycleways, and new bus routes.

The neighbourhood design statement in section 4.12 provides commentary and recommendations around greater recognition of the non-European history of the area through design, respect for and protection and enhancement of the natural environment, naming conventions for public places such as reserves and roads, among other matters.

4.10 Historic heritage

There are no AUPOP *Historic Heritage* or *Special Character* overlays identified in the structure plan area.

There is one historic heritage site to which the structure plan has responded. This site is the Weiti portage and overland path known as Te Taruna which runs parallel to the Weiti River on the northern edge of the structure plan area.

Land adjacent to the Wēiti River (within the structure plan area) is proposed to be used for open space. This open space encompasses the likely portage and overland route, impeding industrial development in this area.

Open space land use will provide the potential for future walking and cycling routes adjacent to the Wēiti River, offering an opportunity for users to better connect with the cultural historic significance of the route (e.g. through signage, sculpture, naming). In addition, the proposed area of open space would provide a buffer between the significant ecological area along the upper Wēiti Stream and the adjacent industrial area.

More detail about Historic Heritage is provided in section 6.12, and in the Heritage Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

4.11 Airport

The structure plan area adjoins the North Shore Airport which is an important piece of regional infrastructure and enabling it's on going operation is important.

The identification of the land for industrial activity recognises the location of the airport and enables its ongoing operation and development. The industrial use means that the reverse sensitivity effects of noise from the airport are minimised as noise sensitive activities are managed in the industrial zones.

The structure plan also relies on the existing provisions in the AUPOP to manage airport noise through the Aircraft Noise Overlay and the height of buildings and structures in the industrial area through the Airport Approach Surface Overlay. These are discussed further in Part B section 6.13.

Land uses such as buffer planting and the location of stormwater ponds will need to take into account potential adverse effects on the operation of the Airport, eg in terms of height and potential for bird strike.

The airport has expansion plans, and these are discussed in section 6.13 in Part B. However, at the time of preparing this structure plan they were not sufficiently advanced or had a level of certainty to be reflected in the structure plan.

4.12 Neighbourhood Design Statement

4.12.1 Background

The structure plan guidelines in the AUPOP (Appendix 1 of the AUPOP) set out matters that need to be considered in preparing a structure plan (see Appendix 2 for the complete guidelines). The guidelines also refer to reports that need to be prepared and these include a Neighbourhood Design Statement (NDS). They also state that the reports should be at a level appropriate for the scale of the area and the complexity of the issues identified in the process. The guidelines also refer to external documents that are to be considered and, in this context, include the council's Auckland Design Manual.

The guidelines include a number of matters relating to urban design. They address broad matters such as the natural environment, transport networks and specifically urban development particularly at the neighbourhood scale. These address pedestrian and cycle connectivity, site sizes, open space, transitions between land uses and stormwater management. Given the single industrial land use proposed in this structure plan area, these have varying significance for this structure plan.

This statement aims to bring together the key design elements of the structure plan from other topics and provide a guide to what needs to be addressed to achieve the structure plan vision and the outcomes set out in the objectives. The planning for this area is staged and following this current Structure Plan, there will be the need for further steps, including the preparation of a plan change to the AUPOP. The plan change will implement the Structure Plan, or part thereof, with the inclusion of objectives, policies, rules, overlays and 'live' zonings into the AUPOP. At this more detailed stage of the planning process there will be the need to update this design statement with a further level of detail commensurate to the complexity and detail required for the adoption of a successful plan change. This updated statement could include additional details such as, for example, possible local road layouts with detailed example designs and cross sections, and further detail on the proposed fine-grained mobility network.

As this structure plan is dealing with essentially one land use, this statement is less complex than if there were multiple land uses. The landscape section (sections 4.6 and 6.6) and the supporting Landscape Report, provide substantial background and support to this statement covering many of the design elements.

It is noted that the general approach to design in industrial areas in the AUPOP is limited and is focussed on addressing the edge effects of the industrial areas with adjoining residential and public open space land. The work carried out in preparing this structure plan has identified a number of additional design elements that need to specifically be addressed.

The vision for the structure plan area is set out in section 3 and the section includes sets of objectives relating to the built environment, connections, and the natural environment which this design statement addresses.

4.12.2 Existing Environment

The key elements of the existing environment that the design and development of the area needs to respond to are:

- The stream network, particularly John Creek in the Silverdale West area
- Areas of remnant vegetation in the north of the Silverdale West area
- Views from the motorway and elevated land to the east
- Likely future adjoining residential areas to the south of the structure plan area, west of Dairy Flat Highway and the existing residential area south east of the airport
- Rural zoned land to the west
- The transport corridors to the east and west
- The North Shore Airport.

4.12.3 Design Response

4.12.3.1 Landscape and Building

The structure plan identifies a number of key elements that address the landscape and design issues identified. These are set out in detail in sections 4.6 and 6.6. In summary they are:

- Planting buffers along the motorway and arterial roads
- Riparian area protection and enhancement and green links
- View shaft controls e.g. treed avenues, yard planting, building materials and finishes, roof profiles, roof colours, controls on signage.
- Future Urban zone and North Shore Airport boundary buffer including building setbacks, height and height in relation to boundary controls and planting
- Rural zone boundary buffer
- Gateway entrance point identification
- Road cross section planting
- Yard controls including planting and fencing
- Building location and design adjoining the FUZ and open space
- Building form e.g. office components to the front of sites
- Parking location e.g. to the rear or side of buildings
- Storage and screening – relates to neighbouring residential and open space zones and streetscape amenity
- Noise attenuation by building design, planting or walls

4.12.3.2 Connections

The structure plan also incorporates elements relating to the transport network outlined in detail in sections 4.3 and 6.2.

The arterial and collector road network is designed to provide easy and convenient access and circulation to future sites in the structure plan area. It minimises the number of intersections on the arterials, provide for safe intersections and corridors and minimises stream crossings. Where possible the road network also adjoins the open space network.

An extensive cycling and walking network is also identified. Where these are on-road the road cross sections show them separated from the traffic flow. The predominance of signalise intersections will also enable easier and safer crossings for cyclists and pedestrians. Extensive use is also made of the riparian open space networks for the cycling and walking network. Specific design details will be defined at later stages of the planning process.

4.12.3.3 Te Aranga principles

Te Aranga Māori Design Principles are designed to provide practical guidance for enhancing Māori cultural values and outcomes in the design environment.

Te Aranga Māori Design Principles are listed below along with some examples to demonstrate their practical application:

Mana: The status of iwi and hapū as mana whenua is recognised and respected, for example: Engagement and relationships with Mana Whenua are established prior to finalising design approaches to maximise the opportunities for design input into any projects; any new project respects and celebrates the natural features and Maori cultural landmarks of the area e.g. Pa, Maunga, Awa.

Whakapapa: Māori names are celebrated, for example: Names of public spaces and streets are gifted by Mana Whenua; recognition of traditional place names through bilingual signage and wayfinding.

Taiao: The natural environment is protected, restored and / or enhanced, for example: Protection of waterways and natural features and landmarks; creating and connecting ecological corridors; low impact design and development of stormwater treatment methods are adopted and required; primarily native, diverse, endemic and local planting is prioritised; the establishment and management of traditional food and cultural resource areas allow for active kaitiakitanga.

Mauri Tu: Environmental health is protected, maintained and / or enhanced, for example: Protection of waterways and natural features by restoration or daylighting, creating and connecting ecological corridors, remediation of contaminated soils.

Mahi Toi: Iwi/hapū narratives are captured and expressed creatively and appropriately, for example: Creative expression of Mana Whenua narratives is incorporated into the design of buildings and public/civic spaces and amenities; use of locally sourced materials wherever possible; primarily native planting is used in public space landscaping.

Tohu: Mana whenua significant sites and cultural landmarks are acknowledged, for example: Respecting and celebrating the natural features and cultural landmarks of the area; heritage trails, opportunities are made to introduce markers and interpretation boards.

Ahi Ka: Iwi/hapū have a living and enduring presence and are secure and valued within their rohe, for example: Any new development respects and celebrates the natural features and cultural landmarks of the area; visual connection to significant sites is created, preserved and enhanced; creative expression of narratives is incorporated into the design of buildings, public spaces and amenities.

4.12.4 Implementation

The above principles should be incorporated where appropriate at each step in the design process alongside consideration of the recommendations of the Cultural Values Assessment which can be applied to the structure plan area.

Engagement and relationships with Mana Whenua should be established early in the process to maximise the opportunities for design outcomes.

The structure plan, and this design statement, set out the broad elements that need to be addressed in the development of the land. The detailed provisions will be further developed through a further design statement for the plan change and may need to be incorporated in a specific precinct.

4.13 Staging

The Structure Plan guidelines in Appendix 1 of the AUPOP set out a number of matters to identify, investigate and address relating to staging. These are:

1.4.1 Urban Form

(2) The phases and timing for the staged release of greenfield land…., in coordination with infrastructure.

1.4.4 Use and Activity

(1) Contribute to a compact urban form and the efficient use of land in conjunction with existing urban areas to give effect to the regional policy statement.

1.4.6 Transport Networks

(1) Integration of land use and development with local and strategic transport networks.

The guidelines also set out in the specialist documents to support the structure plan and plan change process, the requirement for a staging plan. This section addresses the issue of

staging and sets out a staging plan for the rezoning of the land. The programme of plan changes to rezone the land following the adoption of the structure plan would follow the staging plan. The land in later stages would remain zoned Future Urban.

Critical to the issue of staging is the notion set out in the FULSS that the land be "development ready" from dates signalled in the FULSS. Development ready means that the land has had a structure plan prepared, infrastructure is available and is zoned for urban uses in the AUPOP. The term "infrastructure is available", means that for the land to be zoned for industrial uses the necessary infrastructure is in place ready to be connected to, for example, the water and wastewater trunk networks are in the ground.

The FULSS signalled periods from which areas would be development ready, based on a high-level analysis. The FULSS acknowledges that structure planning will determine what the appropriate staging and time frames of subsequent plan changes will be, having regard to the efficient and logical roll out of infrastructure. It states (emphasis added)

> *…**structure plans will determine the appropriate staging and timeframes of subsequent plan changes** ….to ensure the efficient and logical roll out of local infrastructure to these areas. Staging …. will generally follow the sequence and timeframes identified in the Future Urban Land Supply Strategy, **unless an alternative staging is considered appropriate through the structure planning process**[4].*

With the more detailed assessment carried out for the structure plan, it has become evident that not all of the land identified in the FULSS can realistically be rezoned for development all at once.

There are several critical matters to staging the development of the land that need to be considered. These are:

- the need for industrial land, the provision of transport infrastructure,
- the provision of water and wastewater infrastructure,
- stormwater management,
- infrastructure funding
- urban form.

4.13.1 Industrial Land Demand

From the market research undertaken, it is clear that there will be a staged demand for the industrial land. Not all the 600ha gross of land in the structure plan area is required in the short term and the total area would only be required by 2048. The demand sequencing is shown in Table 1. As discussed in sections 4.2 and 6.1 it is considered prudent to plan to ultimately accommodate near the high end of the total range given the limiting characteristics of land suitable for industry, eg easy terrain, close to motorway access, compared with

[4] Auckland Future Urban Land Supply Strategy July 2017 (pg10)

residential land. There are also the difficulties with establishing industry once other activities are in place, such as smaller sites and adverse effects on more sensitive land uses.

Zone	2028	2038	2048
Heavy Industry	0 - 17	2 - 64	4 - 125
Light Industry	14 - 39	78 - 145	143 - 285
Total	14 -56	80 - 209	147 - 410

Table 1 Industrial land requirements (ha net).

4.13.2 Transport

Transport staging is discussed in section 6.2 Transportation. The approach is to develop the land from the north. The ITA shows that 70ha of land could be developed and serviced from the Silverdale Interchange with the proposed upgrades which include widening of the northbound off ramp and provision of a second westbound lane across the motorway. Upgrading Old Pine Valley Road and a new collector road connection to Dairy Flat Highway will also be required to develop the 70ha.

To develop more than 70ha of land for industrial purposes, new and upgraded transport infrastructure is progressively required. The key piece of roading required to develop more than 70ha is the Wilks Road motorway interchange and the new east west arterial between the Wilks Road interchange and the intersection of Dairy Flat Highway and Kahikatea Flat Road.

4.13.3 Wastewater

The wastewater requirements are set out in section 4.4. A new wastewater network is required, and this will be provided from the north via the Milldale wastewater system and the new Wainui tunnel. A new rising main connection to the Milldale wastewater infrastructure across the Weiti Bridge is required. Two new pump stations near the Silverdale Interchange are also required. A new gravity collector line is then required into the Silverdale West part of the structure plan area. South of Wilks Road another new gravity collector will flow to the south to a pump station and new collector flowing to the north to a pump station in the Pine Valley East area.

4.13.4 Water

The water requirements are set out in section 4.5. A new water network is also required, with a new bulk watermain connecting from the Orewa 1 watermain in the Highgate Business Park across SH1 (future Highgate Bridge), through the Milldale area, across the Weiti Stream (future Weiti Bridge) and into the Silverdale West Industrial zone.

4.13.5 Stormwater

In terms of stormwater management, it is generally preferable that development starts at the bottom of a catchment. For the northern part of the structure plan area the land close to the Silverdale Interchange is the low point of the Pine Valley and the John Creek catchments.

4.13.6 Funding

Infrastructure funding is addressed in section 4.14. The key point in relation to staging and funding, is that council's and its CCO's funding envelopes are limited and will not cover all of the trunk infrastructure required to support the development of the structure plan area. The provision of infrastructure therefore needs to be staged to that which can realistically be funded.

4.13.7 Urban Form

The issue of the form of development is closely aligned with the provision of infrastructure. It is preferable that development generally starts near the existing urban areas. In this case this is Milldale and the existing Silverdale business area. It is not appropriate to have sporadic development occurring in a haphazard form over too large an area as this would be inefficient in terms of the provision of infrastructure.

4.13.8 Staging Plan

Following consideration of the above factors the following staging is proposed and is shown in Figure 8.

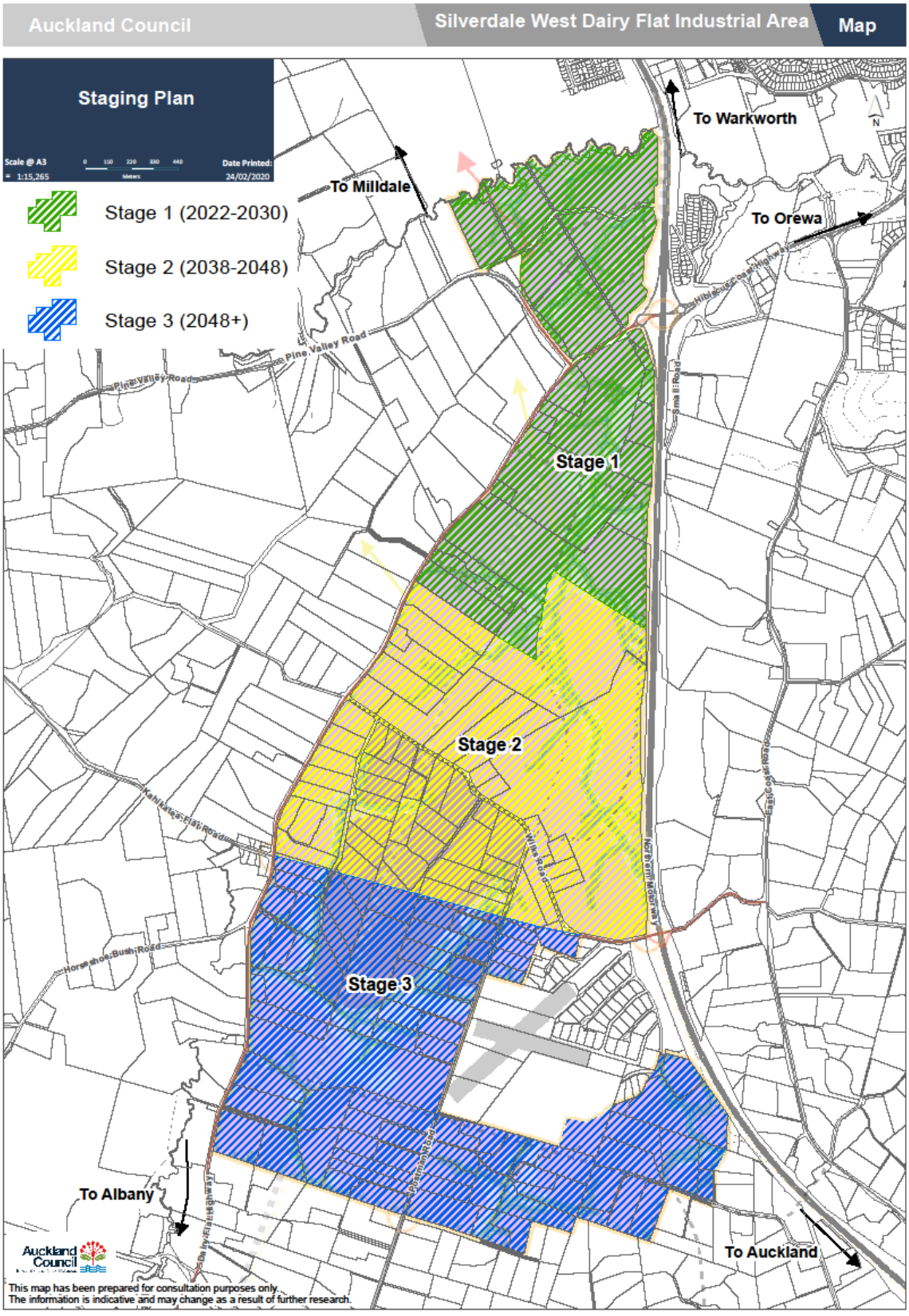

Figure 8 Staging plan

4.13.8.1 Stage 1 (2022 to 2038)

Stage 1 is approximately 87ha (net) and comprises the northern section of the structure plan area including Pine Valley East and the northern part of Silverdale West. The southern boundary is south of the middle arterial road in Silverdale West which is a logical staging boundary. This results in the first stage being slightly more than the 70ha referred to in the ITA but is logical in terms of the provision of infrastructure and land development.

This stage will only provide light industrial land as the heavy industrial area identified in the structure plan is located further south. The 87ha is consistent with the lower estimate (78-145ha net) of the light industrial land required in 2038 shown in Table 1 above. While the amount of land is at the low end of the range, this is considered acceptable as it is necessary to balance the supply of land with the provision of infrastructure.

As noted above, this stage can be serviced from a transport perspective, by the existing Silverdale Interchange. Other transport infrastructure required for Stage 1 includes the upgrade of the northern section of Dairy Flat Highway and a new arterial link to the north to Wainui. New collector roads are required in Pine Valley East, the western part of Silverdale West and part of the collector to the east of John Creek. The first stages of the cycle and walking network along John Creek and in Pine Valley East is also required. At the time of the plan change, further assessment of the traffic effects of the additional land in the stage may be required. In particular in terms of the progress of Penlink, the rate of development in Milldale and in the Stage 1 industrial area.

This area can also be serviced for wastewater from the north via the new collector from Milldale and with a pump station near the Silverdale Interchange and a new collector to the south.

Water can also be provided to the stage from the north with a new pump station on the Orewa 2 watermain and a connection across the Highgate Bridge from the Orewa 2 watermain and the construction of part of the Orewa 3 watermain within the stage.

As this stage includes the lower end of the Pine Valley and John Creek catchments, they are appropriate to stage first from a stormwater management perspective.

Stage 1 therefore provides for the demand anticipated from 2022 to 2038.

4.13.8.2 Stage 2 (2038 to 2048)

Stage 2 covers approximately 124ha (net). It extends south from the Stage 1 area to the new east west arterial between the Wilks Road interchange and the intersection of Dairy Flat Highway and Kahikatea Flat Road. This extends development south over the remainder of Silverdale West and across Wilks Road into the northern part of the Postman Road area. The later area is in the Rangitopuni catchment which flows to the south. This stage would introduce the first 31ha of heavy industrial land. This would provide a total of approximately 211ha (net) of industrial land which is within the range to meet the projected low demand to 2048 (i.e. 147ha – 410ha). However, prior to rezoning Stage 2 the demand for heavy

industrial land will be further investigated to determine the level of need for it in the structure plan area.

To zone this area the new Kahikatea Flat Road extension from Dairy Flat Highway to Wilks Road and the Wilks Road motorway interchange are required. Also required is the upgrade of Dairy Flat Highway south to Kahikatea Flat Road. The Wilks Road collector and the northern part of Postman Road will require upgrading and the new collector network within Silverdale West will need to be completed. The rest of the cycling and walking network in the Silverdale West area would be required and the first sections of the cycling and walking network south of Wilks Road would be needed.

In terms of wastewater, this stage would require the extension to the collector in Silverdale West required for Stage 1. It would also require the construction of the collector network to the south of Wilks Road.

Similarly, water supply can be provided by the extension of the Orewa 3 watermain to the south of Wilks Road.

In terms of stormwater, Stage 2 would mean that stormwater management would be required in the head of the Rangitopuni catchment which flows to the south.

While the need to extend the wastewater and stormwater networks to the south into the upper reaches of the Rangitopuni catchment is not ideal, this stage does deliver the first area of heavy industrial land.

Stage 2 would therefore provide for the demand anticipated from 2038 to 2048.

4.13.8.3 Stage 3 (2048+)

Stage 3 covers approximately 132ha (net) in the Postman Road area and when rezoned means all of the structure plan area is zoned for development. It extends from the Kahikatea Flat Road extension south to the southern boundary of the structure plan area. This includes the rest of the heavy industrial area.

In terms of transport infrastructure, the rest of Dairy Flat Highway adjoining the structure plan area would need to be upgraded. Postman Road would also need to be upgraded and the new collector south of the airport between Dairy Flat Highway and Top Road and extending to Bawden Road would be required. By the time that this area is rezoned Penlink is likely to have been constructed so the collector network to Bawden Road would have access to the Penlink interchange. The cycling and walking network south of Wilks Road could be completed.

For wastewater, the trunk collector will need to be expanded to the south. For water, the Orewa 3 watermain would need to be extended to the south.

In relation to stormwater, the rest of the downstream network would need to be developed.

The completion of Stage 3 would provide a further 132ha. This would mean a total for the three stages of approximately 342ha (net) of industrial land which would be within the range of the projected demand to 2048 but is still less than the high projected demand to 2048. This would comprise all of the structure plan area.

4.13.9 Rezoning

The staging set out above will help determine the timing of the preparation of plan changes to rezone the land.

Land in later stages beyond the initial plan change, will remain zoned Future Urban.

Ongoing monitoring will be required at all stages to determine the best timing for the rezoning of Stages 2 and 3. Prior to the rezoning of Stage 2, the level of need for heavy industrial land will be further investigated to determine the demand for it in the structure plan area. If the projected high of 400ha(net) of industrial land is required, this can be considered as part of the structure planning for the rest of the Dairy Flat Future Urban Zone to the south anticipated to be development ready from 2033 -2037.

4.14 Infrastructure Funding

The critical council infrastructure that provides essential bulk services which enable land development in this structure plan area include:

- Transport networks
- Wastewater networks
- Water networks
- Stormwater.

The infrastructure and services required to support land development within the structure plan area will require substantial public and private investment. It is critical that the provision of infrastructure and services is planned and coordinated to align with planned growth.

The council generally funds and delivers public infrastructure projects and services through the collection of development contributions and rates, and in the case of Watercare, infrastructure growth charges. council's funding envelope is limited and will not cover all the infrastructure required to support Auckland's growth over the next 10-30 years. Additional funding options may include targeted rates or special purpose vehicles for private financing.

In addition to any bulk infrastructure and services that is not publicly or alternatively funded, developers will need to provide all other infrastructure required to support development including, for example, collector roads, stormwater ponds etc.

Council infrastructure providers are still identifying the bulk infrastructure required to enable the development of land in the structure plan area. This includes a time estimate for each of the development stages in which the infrastructure and / or services are expected to be required. The list of projects by stage and estimated bulk infrastructure costs is included in

the Silverdale Funding Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

It is estimated that the total cost for transport, stormwater, wastewater and water bulk infrastructure across all stages of the structure plan will currently (2020) range from $730,000,000 to $890,000,000. The figures for the transport costs only include the costs of the arterial roads and cycling and walking facilities. The collector road network will be delivered by land developers and is not included in these costs. These figures do not include the cost of the Rapid Transit Network which is estimated to be in the range of $1.03 billion to $1.29 billion for the whole project from Albany to Milldale.

It is important to note that few, if any projects and services have funding allocated.

This report does not address infrastructure required or provided by other parties such as electricity and telecommunications. Detailed discussions with power and telecommunication companies can occur at the plan change stage.

More detail is provided in the Infrastructure Funding Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

PART B: DEVELOPING THE STRUCTURE PLAN

This part of the structure plan sets out all the background and explanatory information that led to the structure plan option identified in Part A. It covers the material required to be considered in the AUPOP Appendix 1 Structure Plan Guidelines.

5 STRATEGIC AND POLICY CONTEXT

This section summarises the most relevant statutory and non-statutory plans and strategies that must be considered in the development of the structure plan. This section is not intended to be a full summary of all applicable legislation.

5.1 The Auckland Plan

The Auckland Plan 2050 was adopted in June 2018. It is council's long-term spatial plan to ensure Auckland grows in a way that will meet the opportunities and challenges of the future. The plan sets the high-level direction for Auckland. It outlines the big issues facing Auckland, including the values that will shape how we work together. It identifies key organisations that will play important roles in creating our shared future.

The plan's Development Strategy and six outcomes set Auckland's strategy to 2050. They consider how we will address the key challenges of high population growth and environmental degradation, and how we can ensure shared prosperity for all Aucklanders.

As Auckland continues to grow, the plan seeks to ensure that all Aucklanders benefit from the social and economic prosperity that growth brings while delivering significant environmental benefits. The plan contributes to Auckland's social, economic, environmental and cultural wellbeing through the Development Strategy. It is intended to enable coherent and co-ordinated decision-making by the council and other parties to determine the future location and timing of critical infrastructure, services and investment within Auckland. It provides the basis for aligning the council's implementation plans, regulatory plans and funding programmes including the Auckland Unitary Plan, the long-term plan and other core plans and strategies.

The Auckland Plan takes a quality compact approach to growth and development. This means future development will be focused in existing and new urban areas within Auckland's urban footprint. It recognises that as Auckland grows it must offer capacity for new business growth and states that around 263,000 new jobs may be needed over the next 30 years.

The Development Strategy is the key part of the Auckland Plan in the context of this structure plan. It shows how Auckland will physically grow and change over the next 30 years. It takes account of the outcomes Aucklanders want to achieve, as well as population growth projections and planning rules in the Auckland Unitary Plan.

The Development Strategy specifically addresses business land in future urban areas and indicates that approximately 1,400ha of business land is needed in greenfield areas.

Structure plans are a key implementation mechanism that delivers the Auckland Plan's six outcomes and the Development Strategy, particularly in future urban areas. The Silverdale West Dairy Flat Industrial Structure Plan area is identified in the Development Strategy as an indicative Future Urban Business Area. The Strategy acknowledges that the exact location and quantity of business land will be confirmed through structure planning.

5.2 Future Urban Land Supply Strategy

The council's Future Urban Land Supply Strategy July 2017 (FULSS, 2017) sets out a programme for sequencing future urban land over 30 years across Auckland. Figure 9 sets out the FULSS 2017 dwelling estimates for development of north Auckland including the Silverdale West Dairy Flat Industrial Area. It also sets out sequencing of development.

The FULSS July 2017 identifies part of the Silverdale West Dairy Flat area specifically for business and it is sequenced to be development ready between 2018 – 2022. The Silverdale West Dairy Flat Industrial area comprises approximately 603ha and the FULSS 2017 indicates that this could deliver nearly 9000 jobs.

The surrounding Future Urban zoned land is identified in the FULSS 2017 to be development ready in the second half of the period 2033 – 2037. In summary, the FULSS 2017 estimates approximately:

- 4,500 dwellings in Wainui East
- 28,400 dwellings in the remainder of the Upper Ōrewa, Wainui, Silverdale and Dairy Flat area.

Actual development yields may differ from these estimates once structure planning is completed.

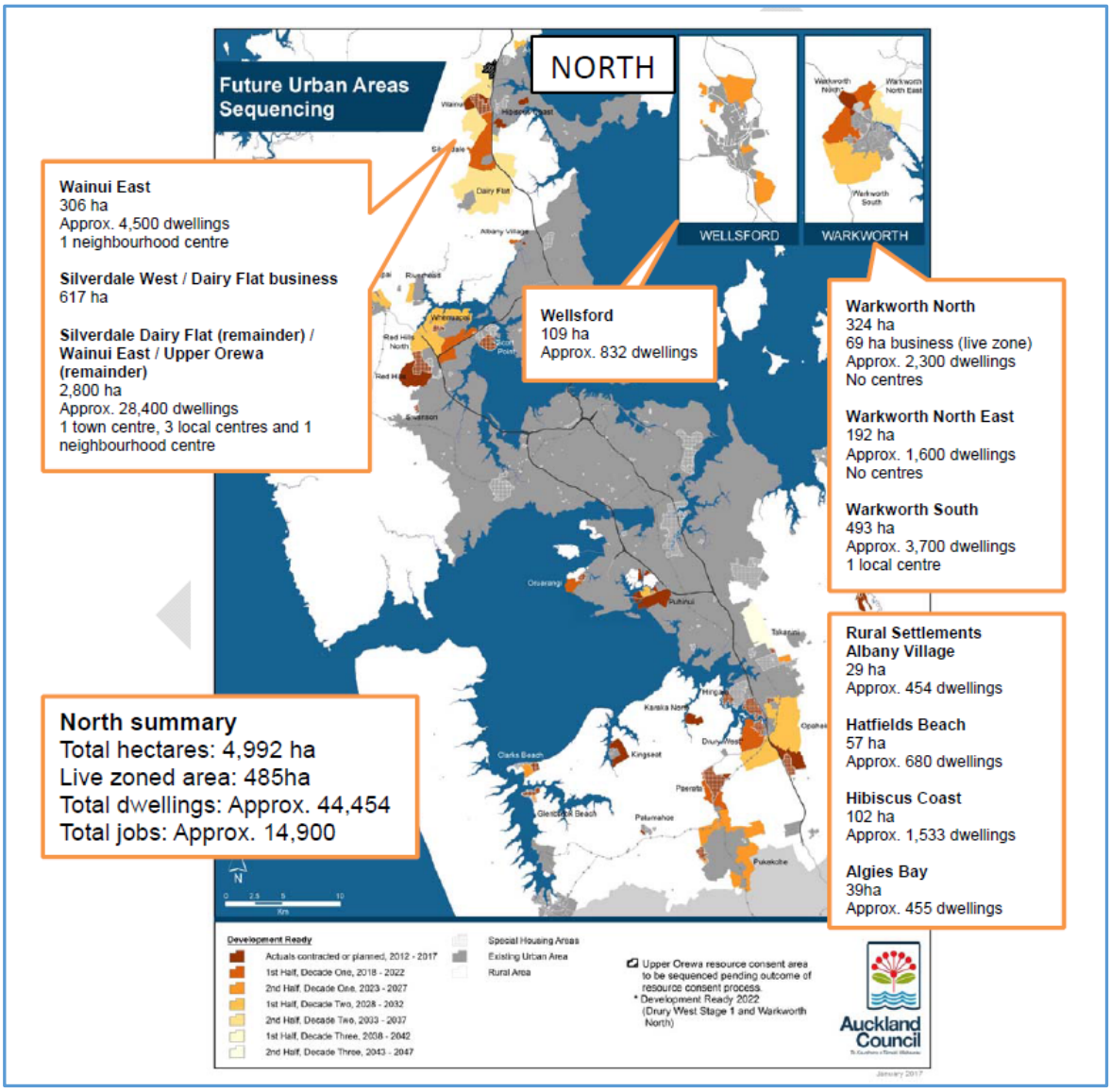

Figure 9 Northern future urban areas

5.3 Long-term Plan

The council's Long-term Plan 2018-2028 was adopted in May 2018. It outlines a 10-year budget for the council's investment in Auckland. Large-scale greenfield development in the north is anticipated in the Long-term Plan (2018-2028), including large infrastructure projects that will have a direct impact on structure planning of the Silverdale West Dairy Flat Industrial Area. These include roading projects such as Penlink and those at Wainui in the period 2019-2028 and at Wainui Silverdale Dairy Flat in the periods 2029-2038 and 2039-2048. The plan also notes NZTA initiatives such as SH1 improvements north of Albany, including bus shoulder lanes from Albany to Silverdale. Wastewater improvements to the Army Bay wastewater treatment plant and a catchment transmission network to provide for growth in the Wainui Silverdale Dairy Flat future urban areas are also identified. Provision is also made for stormwater infrastructure.

Funding for any additional projects identified through the structure planning process to support urban growth will be considered in the next Long-term Plan (2021-2031), future annual plans and other mechanisms.

5.4 Auckland Unitary Plan Operative in Part

The Auckland Unitary Plan (AUPOP) contains new land use policy, rules and zoning for Auckland. It also includes overlays which identify important natural and historic values and characteristics which must be taken into account when making decisions about land use during structure planning.

The Regional Policy Statement (RPS) is part of the AUPOP. It sets out the overall strategic framework for Auckland. Sections B1 to B10 of the RPS all have varying degrees of relevance to structure planning. In particular, section B2. Tāhuhu whakaruruhau ā-taone - Urban Growth and Form, sets out objectives and policies for urban form and growth. These require that the rezoning of future urban zoned land to urban zones be in accordance with the Appendix 1 Structure Plan Guidelines. The Guidelines list information required and desired general outcomes for structure planning. A summary of how the requirements of Appendix 1 of the AUPOP have been addressed in this document is provided in Appendix 2.

The structure plan area is identified within the Rural Urban Boundary and zoned future urban in the AUPOP. Land in the Future Urban zone has been determined as suitable for future urban development, but appropriate urban zones are needed before urban development can occur. Structure planning is a prerequisite to determining appropriate urban zoning.

There are also a number of objectives and policies in the RPS relating to the provision of industrial land. These seek to ensure that there is sufficient land supply to accommodate growth and, in this context, industrial growth. Specifically, they seek to ensure that there is at any one time a minimum of seven years' projected growth.

In particular they refer to a supply of land for land-extensive industrial activities and for heavy industry in areas where the character, scale and intensity of the effects from those activities can be appropriately managed. They also refer to enabling *a* supply of industrial land which is relatively flat, has efficient access to freight routes and can be efficiently served by infrastructure.

Other parts of the AUPOP contain objectives, policies and rules about natural resources, heritage, hazards, infrastructure and other matters that are relevant to structure planning.

5.5 National Policy Statements

5.5.1 National Policy Statement on Urban Development Capacity 2016

The National Policy Statement on Urban Development Capacity 2016 (NPS-UDC) directs local authorities to provide sufficient development capacity in their resource management plans for housing and business growth to meet demand. Development capacity refers to the

amount of development allowed by zoning and regulations in plans that is supported by infrastructure. The Silverdale West Dairy Flat Industrial Area structure planning process will assist the council in giving effect to the NPS-UDC by providing the analytical foundation to support future plan changes to provide urban zones and related infrastructure.

5.5.2 National Policy Statement for Freshwater Management 2014 (Amended 2017)

The National Policy Statement for Freshwater Management 2014 (NPS-FM) provides national direction for managing the water resource, including land use and development activities that affect freshwater. It contains objectives and policies for managing water in an integrated and sustainable manner while providing for economic growth.

The structure plan area has a significant number of permanent and intermittent watercourses and overland flow paths. The land use change in the structure plan area will occur near the watercourses and will affect the quantity /quality of discharges to these watercourses.

5.5.3 National Policy Statement on Electricity Transmission 2008

There is no National Grid Corridor traversing the structure plan area, but it does pass through the Future Urban zone to the south east.

5.5.4 National Environmental Standards for Air Quality

These are regulations made under the Resource Management Act 1991 which aim to set a guaranteed minimum level of health protection for all New Zealanders. This standard has some relevance to the location of industrial zones in relation to other zones.

5.5.5 National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health 2011

Under this standard any sites where activities on the Hazardous Activities and Industries List have occurred must be identified. This standard provides a nationally consistent set of controls and soil contaminant standards to ensure land affected by contaminants in soil is appropriately identified and assessed before it is subdivided or developed.

5.6 Iwi Management Plans

Ngāti Manuhiri, Ngāti Rehua, Te Kawerau ā Maki, Te Rūnanga o Ngāti Whātua, and Ngaati Whanaunga have expressed an interest in the structure plan. Accordingly, the relevant iwi management plans are considered to be:

- **Kawerau ā Maki Trust: Resource Management Statement (1995)**
  This statement sets out goals and concerns in regard to the sustainable management of taonga (treasure or of value) within Te Kawerau's tribal area. The document is recognised under sections 66(c) and 74(b) of the Resource Management Act 1991.

  Central concepts of sustainable management are referred to in the document, with associated objectives and policies outlined. Central matters include:

  - Provision for the social, economic and cultural well-being of Te Kawerau.
  - Heritage (Te Kawerau history, culture, traditions, tikanga, place names, artefacts, wāhi tapu and historic places and areas)
  - Koiwi (human remains) and artefacts unearthed through earthworks and/or erosion
  - The mauri (life force) of all natural waterways
  - The coastal marine area
  - Waste (wastewater, landfill/solid waste, waste via stormwater)
  - Land and landscape values
  - Flora and fauna
  - Design (building architecture (particularly civic buildings), public areas,

These matters are responded to in section 4.9 and 6.11 on Cultural Values.

The Ngāti Rehua Ngātiwai ki Aotea Trust: Hapū Management Plan (2013) has also been considered.

5.7 Climate change

In June 2019, Auckland Council declared a climate emergency. The climate implications of decisions, such as this structure plan, now need to be addressed.

The Auckland Plan addresses climate change at length and recognises the challenges that need to be addressed as the city grows.

The council is also preparing Auckland's Climate Plan which is expected to be completed in 2020. It will set a path to rapidly reduce greenhouse gas emissions to keep within 1.5°C of warming whilst ensuring Auckland is prepared for the impacts of climate change. In March 2020, Auckland Council also reaffirmed its commitment to an interim target of halving Auckland's emissions by 2030 and a precautionary approach to planning for change. This, and the ongoing development of actions within the climate plan will inform and guide responses in relation to Auckland's development. Council agreed to the development of detailed and costed actions for Council as its contribution to climate action for input to the Long-term Plan.

There are two aspects to the climate change issue that need to be addressed and these are reducing greenhouse gas emissions and adapting to the impacts of climate change.

In the context of this structure plan, at a high level, the rezoning of greenfield land for industrial development will likely lead to an increase in the region's greenhouse gas emissions. The act of changing land use from greenfield to industrial development will itself result in the loss of carbon from soils and vegetation currently present onsite, whilst construction materials used in the development will also have embodied carbon associated with its manufacture. The growth will result in increased traffic movements, which are currently Auckland's largest single contribution to greenhouse gas emissions, and potentially industrial discharges depending on the type of industries that locate in the area. These industrial discharges could also include greenhouse gas emissions associated with onsite activities such as process heat generation, the majority of which is currently generated from fossil fuel sources.

However, there are several aspects of the structure plan that go towards mitigating the effects of emissions from vehicles. These include the following:

- Provision of land for additional employment in the Hibiscus Coast area to help reduce trips to employment for new and existing residents (sections 4.2 and 6.1)
- provision for walking and cycling (section 4.3.3 and 6.2)
- riparian vegetation planting (section 4.8.1 and 6.5)
- A Rapid Transit Network and other public transport routes to the area (see section 4.3.4 and 6.2)

Given Council's commitment to halving the region's emissions by 2030, the initiatives implemented to reduce emissions will need to more than offset the potential increases associated with the development.

Emissions from industry will be controlled by the rules in the Unitary Plan.

In terms of adapting to the impacts of climate change there is information on the potential impacts of climate change detailed in the Auckland Region Climate Change Projections and Impacts and Climate Change Risks in Auckland

The most likely impact on the change in land use proposed by the structure plan have been identified as the increase in extreme rainfall intensity and events which could result in greater flooding. This has been taken into account in the Stormwater Catchment Management Plan and the methods and design capacity of the stormwater system (see sections 4.8 and 6.5).

At the plan change stage there will be the opportunity to address some of these issues further as well as those such the opportunities for the efficient use of water and wastewater.

5.8 Local Board Plans

The structure plan area is located within the Rodney Local Board boundary. Adjacent to the structure plan area, to the east of State Highway 1, is the Hibiscus and Bays Local Board area. Both local board plans are considered relevant to the area.

5.8.1 Rodney Local Board Plan 2017

Specific aspirations within the plan which are relevant to Silverdale West Dairy Flat include:

- establishment of key public transport links and mode share in Rodney including new north-south and east-west connections
- establishment of park-and-ride facilities in Rodney
- all new developments to include high-quality footpaths, walkways, bridleways and cycleways options
- improve the water quality in our harbours and waterways
- work with landowners, businesses and key stakeholders to promote sustainable and environmentally friendly work practices
- develop local business precincts and town centres as great places to do business.

5.8.2 Rodney Transport Projects Advocacy Plan 2016

This transport advocacy plan sets out prioritised transport projects that the Rodney Local Board is seeking to have implemented over the next ten years. Relevant to Silverdale West Dairy Flat is the provision of transport infrastructure to serve the future industrial/business zone at Silverdale West.

5.8.3 Hibiscus and Bays Local Board

This section addresses several documents prepared by the Hibiscus and Bays Local Board. While the structure plan area is not in the board area it is very close, and development of the structure plan are will impact on the board area. The relevant documents are the Hibiscus and Bays Local Board Plan 2017, the Hibiscus and Bays Area Plan 2014, and the Silverdale Centre Plan 2015.

Specific aspirations within these plans which are relevant to Silverdale West Dairy Flat structure plan area include:

- improving transport connections throughout the area by extending the Northern Busway, implementing Penlink and constructing new busway stations north of Albany
- development of walkway and cycleway connections including safe crossings
- develop employment land in and around Silverdale to increase employment opportunities for local people
- establish the ‘North-West Wildlink’ as a continuous greenbelt complemented by improved quality of the adjoining Weiti River estuarine and marine environment
- maintain the areas adjoining the Northern Motorway as a green corridor
- protect and restore land and freshwater ecosystems through a ‘whole-of-catchment’ approach
- support the provision of upgraded intersections at Silverdale, Wainui Road.

5.9 Hauraki Gulf Marine Park

The structure plan area ultimately drains to the Hauraki Gulf, and therefore the Hauraki Gulf Marine Park Act 2000 (HGMPA) is applicable. The HGMPA relates to the Hauraki Gulf, its islands and catchments and its purpose is to:

- integrate the management of the resources
- establish the Hauraki Gulf Marine Park
- establish objectives for their management
- recognise the relationship of the tangata whenua.

The future industrial land uses will result in significant changes to stormwater runoff and associated sediment / contaminant loading. There is potential for these sediments and contaminants to be washed from the land within the structure plan area into the Hauraki Gulf Marine Park environment that is downstream.

The marine receiving environment downstream from the structure plan area includes areas identified as Significant Ecological Areas (Marine) in the Auckland Unitary Plan including the Weiti Estuary, Karepiro Bay and Long Bay Ōkura Marine Reserve, the intertidal areas and shell-spits. There is also extensive intertidal feeding habitat for wading birds along the coastline, and Outstanding Natural Landscape, High Natural Character overlaying protections creating an outstanding public landscape in the coastal environment. There is also the policy to avoid adverse effects of activities in Policy 11(a)(vi) of the New Zealand Coastal Policy Statement 2010.

5.10 Previous Consultation

5.10.1 Mana Whenua Consultation

There is ongoing engagement with interested iwi on this project. Towards the beginning of the project a letter was sent out (September 2017) to numerous iwi informing them of the project and inviting further discussions. Of those contacted, Ngāti Manuhiri, Ngāti Rehua, Te Kawerau ā Maki, Te Rūnanga o Ngāti Whātua, and Ngaati Whanaunga all expressed interest in being involved in the structure plan process.

A hui was held in November 2017, with representatives from Ngāti Manuhiri and Ngāti Rehua in attendance. Discussions were held on the project.

Among various ongoing communications, a *Cultural Values Assessment (CVA) for Supporting Growth (Auckland Transport) in Silverdale, Dairy Flat and Wainui*, prepared on behalf of Ngāti Manuhiri, was provided to the project team in March 2018. The CVA was prepared in response to Supporting Growth, rather than directly to the structure plan, however crossover elements were highlighted as being relevant to the structure plan project.

A draft interim response to the CVA was provided by the project team to Ngāti Manuhiri in November 2018. A brief comment was received from Ngāti Manuhiri around seeking that stock access to waterways be retired as soon as possible, and for there to be ongoing

engagement in the project, and beyond the project (i.e. plan change, development stages). The CVA has contributed to the Structure Plan.

A draft of the structure plan was provided to iwi prior to public notification. Feedback was received from Ngāti Manuhiri and Ngaati Whanaunga. There was broad support for many aspects of the structure plan. There were also several recommendations relating to ensuring stormwater quality is controlled in the Karepiro Bay and Long Bay -Okura Marine Reserve and that riparian margins are protected.

5.10.2 Public Consultation

The background report produced in late 2017 summarised the technical information researched to date for the area and provided an overview of the structure planning process going forward. This background report was the basis for public consultation between December 2017 and February 2018. Land use options were not drafted at that stage. Landowners and the wider community were invited to provide their initial thoughts on the vision for the area's future.

Public drop-in events were held in February 2018, with information and feedback opportunities also available at local libraries, service centres, and online. Letters were sent to landowners within the structure plan boundary. Overall 203 submissions were received.

Key themes emerged from the responses received to questions asked in the feedback form, and the free-text submissions and included:

- Providing jobs locally
- Having a range of employment options
- Creating quality buildings and surroundings
- Having public open space in business/employment areas
- Improved transport connections to the area
- Being able to travel to work by public transport
- Protection and restoration of natural areas, streams etc.

As discussed in section 2.3.3 above, the Draft Silverdale West Dairy Flat Industrial Area Structure Plan was released for public consultation in March 2019. Further information can be found in the Silverdale West Dairy Flat Industrial Area Structure Plan Engagement Summary on the Draft Structure Plan August 2019 This is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

6 TECHNICAL TOPICS

6.1 Industrial Land

Wainui Silverdale Dairy Flat will become one of Auckland's key growth areas in the next three decades, and that growth will require significant new provision of industrial as well as retail and other business land to provide employment and services to meet the future needs of the community.

The Auckland Plan 2012, the guiding document when the structure plan was initiated and through to 2018, indicated that:

> *At least 1,400 hectares of additional greenfields land will be provided for business activities. Approximately 1,000 hectares of this will be for business activities that require large tracts of land (e.g. manufacturing, transport and storage, logistics and similar activities)….. A further 400 hectares of land will be provided for commercial activities, such as retail, office and service activities.*

The Auckland Plan 2012 identified a greater need for industrial land than it did for other types of commercial land.

The reviewed Auckland Plan 2050 (June 2018) sets out a Development Strategy and this specifically addresses business land in future urban areas and indicates that approximately 1,400ha of business land is needed in greenfield areas.

In addition, the former Rodney District Council had identified a shortage of industrial land in the then Rodney District Council area in the early 2000's and subsequently identified part of this structure plan area for industrial development (Draft Silverdale West Structure Plan 2010).

The FULSS 2017 and the Supporting Growth transportation project identified an area of business land in the Wainui Silverdale Dairy Flat area. Given the areas previous history as a possible industrial area, and the demand analysis set out below, it is logical to continue with this land use. This area has become the Silverdale West Dairy Flat Industrial Structure Plan area.

The projected households in the future urban area and the adjoining rural hinterland, is expected to be nearly 50,000 households by 2048. Of that growth, 74% is expected to be in the Future Urban zone area, and most of that (45% of total growth) will be in the southern part of the FUZ.

The Wainui Silverdale Dairy Flat area is likely to become the focus for future light industry growth given both projected population growth in the urban north and due to the imminent exhaustion of light industry zoned supply in the North Shore, Silverdale and the Highgate Business Park. The structure plan area is one of the closest light industry zoned areas to urban Auckland.

By 2048 the net additional industrial land demand will amount to between 156 and 299ha (net) (excludes roads, reserves, flood plains) of light industry zoned land and up to 125ha (net) of heavy industry zoned land.[5] These include a small allowance for non-industrial activities to support the retail and other business needs of the local work force.

The range is due to the underlying assumptions about businesses' location preferences and household employment generation. They reflect the potential for changed locational preferences for industrial land within Auckland, as driven by the creation of a substantial new area of light industry zoned land in the Wainui Silverdale Dairy Flat area. This would have benefits to new businesses such as cheaper land than in the North Shore and the Auckland isthmus, agglomeration economies, co-location with other similar businesses and shared infrastructure.

It is considered prudent to plan to accommodate near the high end of the range given the difficulties with finding more industrial land once other activities are in place. This equates to a total of up to 424ha (net) of additional industrial land being required in the Wainui Silverdale Dairy Flat area. With the addition of land for roads and flood plains, between approximately 590 and 640ha (gross) of land would be required. This range is consistent with the 607ha identified in the FULSS 2017.

In the structure plan area, with the removal of floodplains and roads, the net developable area is approximately 349ha. Of this 293ha is identified for light industry with 56ha for heavy industry. These areas are within the range identified as being needed.

Heavy industry was included in the draft structure plan because a demand was identified in the economic research carried out for the structure plan. Also, the council was aware of there being a demand for large sites which the Heavy Industry zone provides.

There is little difference in the types of industries the Auckland Plan provides for in the Heavy Industry zone compared with the Light Industry zone. The main difference between the zones is that in the Light Industry zone a much wider range of non-industrial activities can occur. These extra activities are often more sensitive to the effects of industry (eg childcare centres). In the Heavy Industry zone these extra activities are either excluded or more strongly controlled (for example non-complying in the Heavy Industry zone and permitted in the Light Industry zone). This means that in the Heavy Industry zone various forms of industry can operate without being constrained by having to avoid adverse effects on more sensitive non-industrial activities (reverse sensitivity effects).

The rules in the Auckland Unitary Plan relating to noise levels allowed in the two zone are slightly different with a higher noise level allowed in the Heavy Industry zone (70dBL_{Aeq}) compared to the Light Industry zone (65 dBL_{Aeq}). The rules relating to air discharges and hazardous substances are the same for the two zones.

The other difference is that in the Heavy Industrial zone larger sites are required in the subdivision rules. The minimum site size in the Heavy Industry zone is 4,000m^2 and is 2,000m^2 in the Light Industry zone. This more readily provides large sites for those industries requiring a large footprint building.

[5] Silverdale business Land Assessment - Market Economics 17 May 2018

Apart from the existing Heavy Industry zone at Silverdale, there is no other area of heavy industry in north Auckland. Including 54ha (net) of heavy industry land in the structure plan area where industry can establish on larger sites unhindered by other activities, would be a positive contribution to the economic future of northern Auckland.

As the heavy industry land is not identified until at least Stage 2 (2038-2048) there is the opportunity to reassess the demand for it prior to the plan change required to rezone the land in Stage 2.Depending on the final location of the RTN route and stations, it may be possible to consider opportunities for business activities that support and benefit from the RTN. There could be an opportunity for transitioning to more intensive business activity around future station locations. This opportunity needs to be carefully targeted in regard to the number of RTN stations and weighed against the travel time objectives for the overall RTN system. The reverse sensitivity effects on surrounding industrial activities would also need to be taken into account.

Projecting demand for industrial land in a high growth area such as this, close to a large established urban area, and when a large change from current economic structures is indicated (i.e. a likely move of industry to the north) is challenging. However, the ranges presented provide a solid indication that a very significant amount of industrial land will be required in the Wainui Silverdale Dairy Flat area in the future.

More detail is provided in the Silverdale Business Land Assessment which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan. and the Response to Feedback Report 2020.

6.2 Transport

6.2.1 Integrated Transport Assessment

An Integrated Transport Assessment (ITA) is a technical supporting input to this structure plan. The Silverdale West Dairy Flat Industrial Area ITA dated 13 March 2019 is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

The ITA provides a high-level review of the proposed land use and transport networks required to support travel and accommodate transport demands. The ITA covers the following key matters:

- To understand the transport effects associated with the urbanisation of the Silverdale West Dairy Flat Industrial area within the context of the growth envisaged for all northern greenfield areas over the next 30 years;
- To identify a list of transport infrastructure and services on arterials, collectors and key links within and immediately adjacent to the structure plan area necessary to both support urbanisation of it and integrate with the wider transport network;

- To define at a high-level possible infrastructure staging scenarios, considering council's intended staging of land release within the structure plan area, and any co-dependencies between transport and water infrastructure etc;
- To identify how integration across modes, and resilience within the transport network, can and should be achieved given the land use in the structure plan area.
- Travel demand opportunities and land use and transport integration opportunities
- Design principles.

The ITA was been prepared in parallel with an Indicative Business Case (IBC) for the north Auckland region prepared by Te Tupu Ngātahi, the Supporting Growth Alliance. As discussed in section 4.3 above the IBC was endorsed by AT and NZTA and the Alliance is now working on detailed business cases. Future ITAs to be prepared in support of plan change and resource consent applications will need to assess the proposed transport network based on the approved outcomes of the IBC.

The key network assumptions from the IBC informing the transport network development within the structure plan are:

- A new motorway interchange at Wilks Road (or nearby) with south facing ramps only.
- a new east west arterial between the Wilks Road interchange and the intersection of Dairy Flat Highway and Kahikatea Flat Road.
- A RTN routed through the structure plan area between Dairy Flat Highway and Postman Road.
- A strategic cycleway adjoining the motorway and the RTN
- Penlink Interchange to the south of the structure plan area with north and south facing ramps

6.2.2 Proposed Transport Network

The roading, and cycling and pedestrian network was primarily described in Part A. In this section these are elaborated upon and the analysis and modelling outcomes carried out as part of the ITA are summarised.

As mentioned in Part A the ITA addresses the RTN options being consider through the IBC process and outlines possible local bus routes. These are shown in Figure 10.

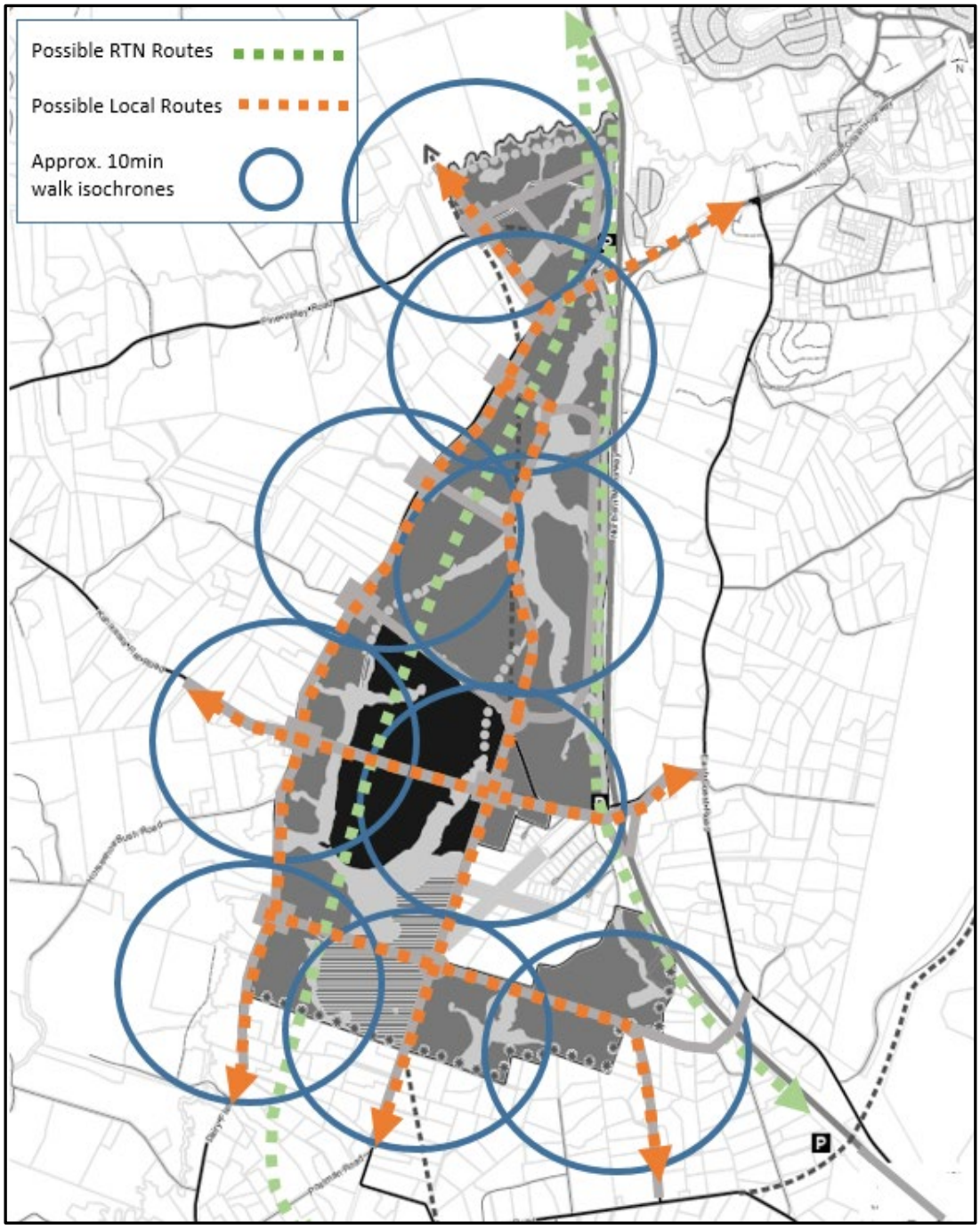

Figure 10 Indicative future public transport network

The isochrones (blue circles) show indicatively that most of the area will be within a 10-minute walk of a bus route. Assuming such local routes eventuate, there will be good connections between the Silverdale West Dairy Flat industrial area and the wider Wainui Silverdale Dairy Flat area.

The ITA addresses a cycling and pedestrian network and this was described in Part A. Only the parts of the network not on roads are shown in the structure plan. The complete network including the proposed on-road sections are shown in Figure 11.

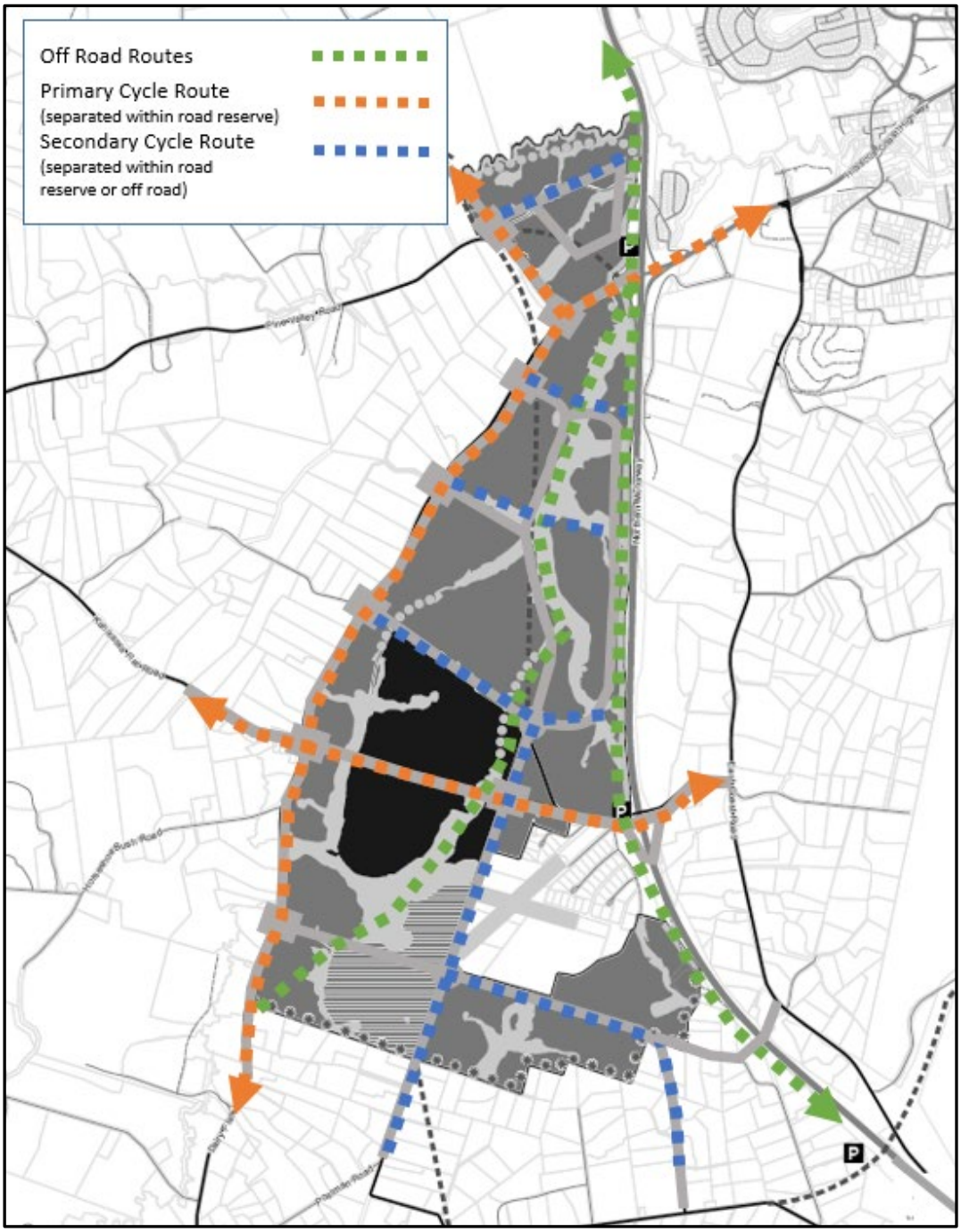

Figure 11 Indicative cycle network

6.2.3 Trip Generation and Mode Share

The ITA has carried out a trip generation and mode share modelling exercise and this is outlined in detail in section 6 of the ITA.

The structure plan area cannot be assessed in isolation due to the significant growth planned to the north in Wainui East and to the south in the Dairy Flat FUZ. The ITA has identified the preferred transport system to support growth in the whole area, which clearly needs to integrate with the structure plan area.

The following table summarises the estimated multi modal peak hour trip generation for the area as described in this section. This is a high-level estimate at this stage.

Travel Mode	AM	PM
Vehicle Trips	5,900	7,800
PT Trips	900	700
Walk and Cycle Trips	700	900
Total	**7,500**	**9,400**

Table 2 Summary trip generation peak hour

The daily traffic volumes on the road network range from 34,000 vehicles per day (VPD) on the eastern parts of Wilks Road within the structure plan area to 1,300 on the eastern collector in Silverdale West.

Applying an indicative daily traffic volume threshold of 15,000 VPD in urban areas as likely to warrant four lanes, Figure 12 shows the possible extent of the four-lane road network within the structure plan area.

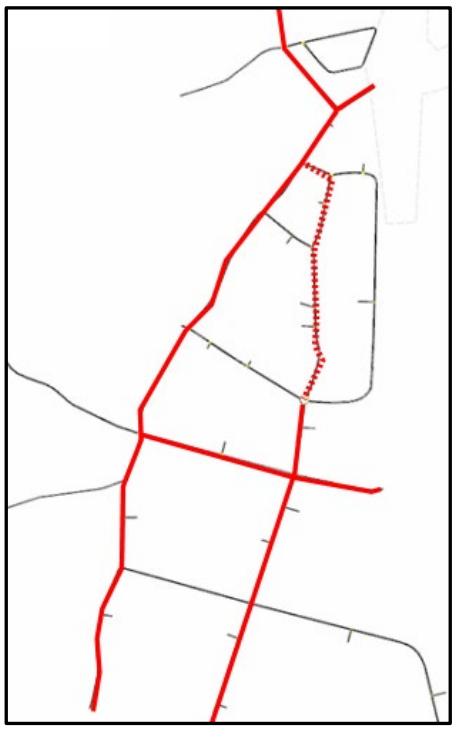

Figure 12 Possible extent of four lane capacity requirement

The additional lanes may be priority lanes for buses, high occupancy vehicles and or freight rather than additional general traffic lanes.

It would not be necessary to initially construct new roads with four lanes as long as road reserves are adequate to provide for four lanes in future when demands warrant the extra capacity. Additional detail is provided in the ITA.

6.2.4 Traffic Model Outcomes

Section 7 of the ITA provides details of the traffic model outcomes. The following provides a summary of this section.

6.2.4.1 Trip Distribution

The ITA has considered trip distribution and this shows a high proportion of trip generation from surrounding areas which indicates that the industrial land is supporting the nearby residential growth areas. In the AM peak 74% of trips to the structure plan area are from within the site, Orewa, Silverdale, Wainui and Dairy Flat areas. This figure is similar for the outbound PM peak trips and trips in both directions during the inter-peak period.

6.2.4.2 Network Performance

The ITA also tested network performance by looking at vehicle speeds in the AM, inter-peak and PM peaks periods. The speeds that vehicles are able to travel at, relative to the speed limit, provide an indication of the level of congestion across the network.

In general, the traffic modelling indicates the network operates with relatively low levels of congestion during the peak periods. The intersection of Postman Road and Kahikatea Flat Road shows some delay in all peaks although this is not significant and may be able to be addressed in more detailed intersection modelling as part of subsequent ITA's.

The ITA also looked at the demand to and from the proposed new Wilks Road interchange (south facing ramps only). This showed that the interchange carries around 2,500 vehicles per hour in the peak hours. Vehicle trips to/from zones within the structure plan area make up approximately 45% of all the trips using the interchange during the AM peak period and approximately 50% during the PM peak period. This shows a high utilisation of the interchange by land uses within the structure plan area.

In terms of the PT network, expected PT trip generation of the structure plan area is not significant and the bus network is expected to be able to accommodate these demands through local services and eventually the RTN. The routing and frequency of services will need to be identified in time as the planning process continues.

6.2.4.3 Intersection Performance

The ITA also tested the performance of the intersections. The results are indicative of how the network operates at a high level. In general, the signalised intersections in the network operate to an acceptable level. There will be more detailed transport modelling and further consideration of intersection design for all road users as part of subsequent ITA's.

6.2.5 Road Cross Sections

Indicative cross sections for the various components of the internal transport networks are shown in the figures 13, 14 and 15 following.

Figure 13 Indicative four lane arterial (approximately 25m road reserve)

Figure 14 Indicative two lane collector road (approximately 21m road reserve)

In the cross sections above there will be alternative means of providing protected cycle paths, such as protected lanes on each side of the carriageway or a two-way off-road path on one side if it suits the location (e.g. on roads next to open space). The key design outcome at this stage is that cyclists should be protected from traffic and separated from pedestrians within the collector road cross section.

Figure 15 Indicative off-road walking and cycling route

Design details such as on road vs off road alignments and intersection treatments will also be defined at later stages of the planning process. As part of this, it will be important to consider how the design of the network and facilities can support an increase in cycle use.

6.2.6 Transport Network Staging

The ITA has identified the key necessary transport infrastructure and recommended staging to support development of the structure plan area. The infrastructure is set out in the following table.

Roads and Intersections
Dairy Flat Highway four lane arterial upgrade
Pine Valley Road four lane arterial upgrade
Wilks Road SH1 Interchange south facing ramps
Kahikatea Flat Road to Wilks Road Interchange new arterial
Postman Road north of Kahikatea Flat Road to Dairy Flat Highway new collector road
Postman Road south of Kahikatea Flat Road to Dairy Flat Highway collector road upgrade
Internal new collector roads north of Kahikatea Flat Road
Internal new east-west collector road south of Kahikatea Flat Road
Internal collector road north of Dairy Flat Highway (old pine valley road upgrade)
Walking and Cycling
Primary off road cycle route alongside SH1
Primary off road cycle route along flood plain alignment within structure plan area
Primary on road cycle route on Dairy Flat Highway
Primary on road cycle route on Kahikatea Flat Road
Secondary east-west cycle route connections
Public Transport
Rapid transit network (to be defined in the DBC)

Feeder buses / local services
Bus priority on arterial roads and collector roads part of frequent network
Bus stops and interchange stations with the RTN

Table 3 List of key necessary transport infrastructure

The ITA also sets out recommended sequencing. This, along with other factors, contributes to the staging proposal for the rezoning of land in the structure plan area set out in section 4.13 of this structure plan. It has identified a broad implementation strategy based on an approach that delivers infrastructure from the north to the south. The approach seeks to unlock development land in the north by upgrading Old Pine Valley Road and a new collector road connection to Diary Flat Highway. At this stage motorway access will be provided via the Silverdale Interchange.
It is estimated that approximately 70 hectares of development (net) could be served by the Silverdale Interchange (with the upgrades proposed by other projects, i.e. Milldale, in place including widening of the northbound off ramp and provision of a second westbound lane across the motorway). This represents around 20% of the total structure plan area. The ITA sets out the steps in the analysis to arrive at this estimate.

Therefore, additional motorway access (Wilks Road or Penlink) is considered likely to be required before around 70 hectares (net developable area) of the structure plan area is developed. This threshold will be subject to further analysis and refinement as part of more detailed ITA's in future.

The majority of the network is developed later with the Kahikatea Flat Road arterial and the Wilks Road interchange being key transport infrastructure required. It is likely that there would be interim stages as the network develops from north to south. The Kahikatea Flat Road arterial connection and Dairy Flat Highway upgrade would likely precede the completion of the internal collector road network.

The ITA provides more detail on the suggested transport staging.

6.3 Wastewater

The structure plan area, along with the rest of the Hibiscus Coast, is serviced for wastewater treatment by the Army Bay Wastewater Treatment Plant (WWTP). It is located on the eastern end of the Whangaparaoa Peninsula, near Shakespear Regional Park.

The wastewater trunk main extends approximately 16km from Orewa through to the treatment plant and is the main wastewater conveyance route on the Whangaparaoa Peninsula. It includes 3 main pump stations located in Orewa, Stanmore Bay and Hobbs Bay.

To service growth across the region, progressive upgrades to the existing trunk wastewater network will be phased with growth. In particular, substantial upgrades to the Orewa, Stanmore Bay and Hobbs Bay pumping stations, plus the Army Bay WWTP will be required.

The timing of each upgrade will be triggered by the rate of development. However, this is should not be a constraint on the proposed staged release of land in the Structure Plan area.

The construction of a new outfall at the Army Bay WWTP was completed in 2019. Watercare obtained a 35 year discharge consent for the Army Bay WWTP in 2019 which enables treated wastewater to be discharged from the existing urban area, the structure plan area, Wainui and the surrounding future urban zone in Dairy Flat,

Watercare is carrying out a wastewater network modelling study which will be used to confirm the requirements for network improvements and upgrades. This will align the network and treatment plant performance and include improvements to the operation of the network to ensure that the system works optimally.

More detail is provided in the Water and Wastewater Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

6.4 Water Supply

There is currently no water supply infrastructure to the west of the motorway.

As illustrated in Figure 16, the Hibiscus Coast is currently supplied by watermains which are fed directly from the Glenvar Reservoir in Albany. Water is delivered via the Orewa 1 (310mm) and Orewa 2 (470mm) trunk watermains along East Coast Road and are routed side by side with multiple cross connections for approximately 11km. There are five existing Bulk Supply Points (BSPs) on the Orewa 1 and 2 watermains supplying areas of the local network. When the trunk watermains reach Hibiscus Coast Road they split, north (Orewa 1) towards Maire Road Reservoir and east (Orewa 2) towards Scott Road Reservoir. The remaining local network is supplied via these two reservoirs with additional localised storage and pump stations downstream.

To increase the capacity of the Orewa 1 watermain during peak demands and to provide security of supply, an existing pump station is situated on the Orewa 1 watermain 4.2km along from the Glenvar reservoir.

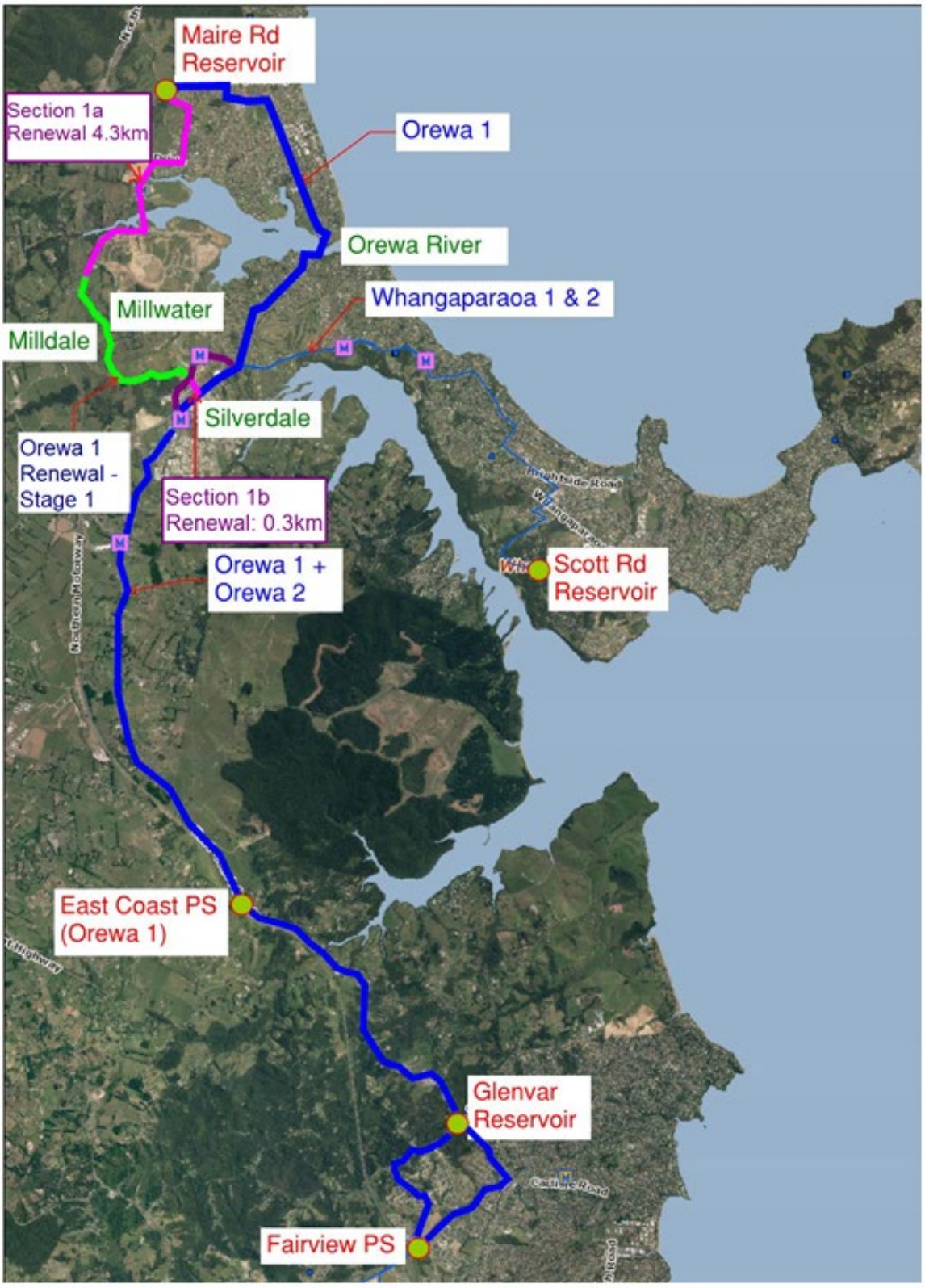

Figure 16 Northern water supply area trunk system

There are several identified limitations in the existing trunk water supply network, they are:

- Ageing trunk water infrastructure requiring renewal in the medium term
- Limited current system capacity to accommodate growth

- Significant projected growth to the west of SH1, away from existing infrastructure.

Trunk water improvements are currently being undertaken as outlined in section 4.5 above. However, there is currently neither sufficient capacity nor resilience in the trunk watermains to provide for the development in the Silverdale West Dairy Flat Industrial area without the proposed Orewa 2 watermain pump station and the connection from the Orewa 1 watermain in Millwater across the Highgate bridge, through Milldale and over the Weiti bridge to Dairy Flat Highway.

More detail is provided in the Water and Wastewater Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

6.5 Stormwater, Water Quality and Flood Management

The information in this section is from the Stormwater Management Plan (SMP) that has been prepared for the structure plan. The SMP provides expanded detail on the existing environment, constraints and opportunities, as well as data capture and analysis. The Stormwater Management Plan is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

6.5.1 Stormwater

There are three stormwater catchments within the structure plan area. These are:

- In the north the Pine Valley Catchment: approx. 65ha in the structure plan area, drains east to Weiti River, ultimately draining to the Hauraki Gulf.
- In the centre the Silverdale South Catchment: approx. 230ha in the structure plan area, drains to John Creek and into Weiti Stream, ultimately draining to the Hauraki Gulf.
- In the south the Dairy Flat Catchment: approx. 310ha in the structure plan area, drains to Dairy Stream and into Rangitopuni Stream, ultimately draining to the Waitemata Harbour.

There is a significant number of permanent and intermittent watercourses and some existing natural wetland features.

The existing stormwater drainage network is predominantly natural channels with minimal existing infrastructure other than culverts under roads. There is an existing network of catchpits, reticulated stormwater drainage, as well as several stormwater ponds related to SH1.

The most common geology is Mahurangi Limestone, accordingly soil soakage capacity is and will be limited.

6.5.2 Flooding

The structure plan area contains large floodplains. These are the Silverdale South and Pine Valley Catchments Floodplain, and Dairy Stream Catchment Floodplain. The floodplain is defined as a 1% annual exceedance probability (AEP) event, including allowance for climate change and maximum probable development (MPD).

Protection of the flood plain and controlling or mitigating the adverse impacts of flooding is integral to protect the health and safety of the public and ensure future resilience to flooding. Flooding mitigation is addressed in Part A.

Silverdale South and Pine Valley Catchments Floodplain

- The main floodplain in the structure plan area is along John Creek and its tributaries between Wilks Road and SH1.
- The floodplain extent is approx. 100m wide.
- There is likely to be limited scope to significantly change the floodplain within the Pine Valley catchment.
- One property outside of the structure plan area is predicted to be negatively affected as a result of upstream development within the structure plan area.

Dairy Stream Catchment Floodplain

- The floodplain is large, however much of it is shallow.
- The extent of flooding can potentially be reduced.
- Within this catchment 17 properties outside of the structure plan area, primarily in the Coatesville-Riverhead Highway area, are potentially negatively affected as a result of upstream development within the structure plan area.

The floodplain extent can be seen in Figure 17.

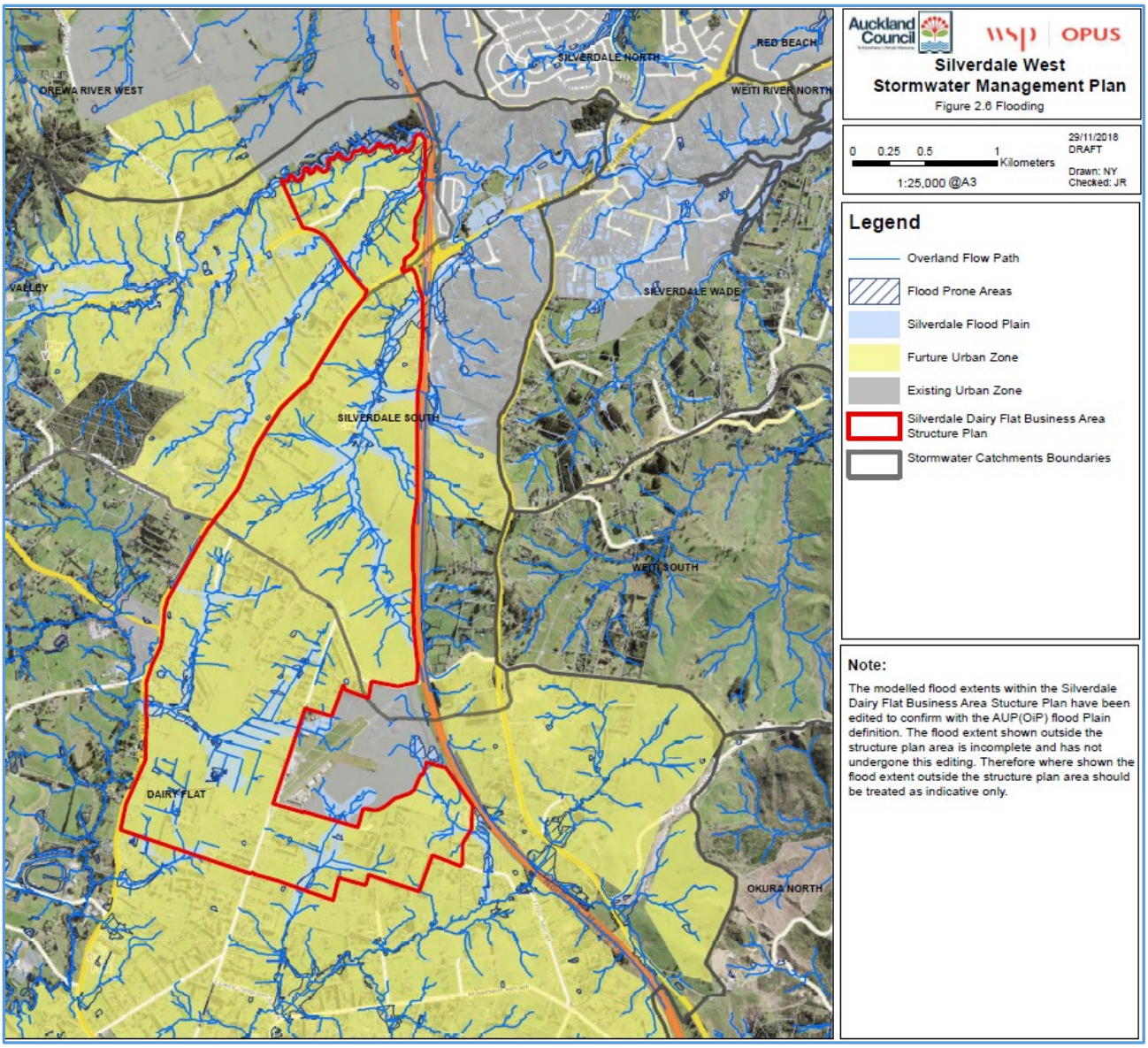

Figure 17 Floodplain extent

6.5.3 Water Quality and Erosion

Streams are integral to the transportation and storage of stormwater, as well as providing life giving capacity to native fauna and flora.

Due to the existing predominantly rural nature of the area many of the streams and tributaries are exposed to stock and contaminants (including additional nutrients (e.g. from animal excreta and fertilisers), microorganisms and sediment). There is no existing wastewater system in the catchment and current properties have on site wastewater treatment facilities. Sewage fungus has been noted upstream. Other sources of contaminants into the stormwater network can include discharge from roads and discharges from other commercial activities.

Erosion of stream banks is also a threat to the health of a stream and the downstream receiving environment. The nature of the soils in the structure plan area, particularly in the

steeper parts, are prone to erosion. The flatter areas with alluvial soils are less prone to erosion. Unmitigated land use change can increase erosion into streams and proposed mitigation is addressed in Part A section 4.8.

The change in land use from rural to industrial will generate different stormwater contaminants. This is due to additional roads and other impervious surfaces within the catchment as well as potential discharges from industrial activities. There is also a risk of additional sediment runoff during earthworks at development stage. Commentary around mitigation can be found in Part A section 4.8.

Watercourse assessments were conducted in the three stormwater catchments within the structure plan area between November 2018 and January 2019. These assessments provide baseline information on the existing condition of waterways in the survey area. This includes the assessment of environmental components such as stream state and infrastructure such as pipe outfalls.

In regard to water quality and the existing environment, the following issues have been identified.

In the Silverdale South, Pine Valley and Dairy Flat catchments:

- Stream modification works have occurred where drainage channels have been straightened subsequently altering the natural drainage pattern.
- Low shading and poor temperature regulation of watercourses due to the clearance of riparian vegetation.
- Ponds and wetlands within the studied area were of low ecological value and generally provided poor aquatic habitat.
- Damage has occurred to streambanks and channels via unrestricted stock damage.
- Aquatic resources within the upper John Creek catchment were of poor quality.
- Fish passage within the area is restricted by culverts and debris.

The watercourse assessments also identified public and private stormwater assets, many of which are in poor condition.

The Dairy Flat catchment flows into the Rangitopuni stream. Further research is being undertaken to investigate erosion within the Rangitopuni, both in the existing situation and in terms of the vulnerability of the stream to erosion from future development in the contributing catchment.

6.6 Natural Character, Landscape and Visual

The existing land use is primarily lifestyle blocks of between 2 and 5ha with housing concentrated along the ridgelines of Dairy Flat Highway and Wilks Road, and along Postman Road. There are several large landholdings located north of Wilks Road and adjacent to SH1. There are a small number of commercial businesses with the largest of these being the Bayes Coachlines depot on Wilks Road and the depot for Bob Hick's Earthmoving on Dairy Flat Highway.

Very little original natural land cover remains with the majority being cleared for pastoral land use. Exotic hedgerows define cadastral boundaries and mature exotic trees provide shading for stock. Poplars and willows follow stream paths. Three remnant areas of native vegetation remain, and these are discussed in section 6.7 below.

John Creek located in Silverdale West is the main stream in the structure plan area. Upper catchment tributaries of the Rangitopuni and Dairy Streams are present in the structure plan area located south of Wilks Road. The stream network overall has been degraded and riparian vegetation is mostly absent with the exception of the vegetation referred to above.

There are several commercial activities outside of the structure plan area which are relevant to the structure plan area. These include the North Shore Airport, which is discussed in sections 4.11 and 6.13, and the Dairy Flat 'commercial node' located at the Dairy Flat Highway/Kahikatea Flat Road junction which is zoned Business-Light Industry. There is also the large-scale business and recreation based development (Snow-planet etc) adjacent Silverdale West, on the elevated slopes to the eastern side of SH1. These are highly visible and influence the character and amenity of the wider visual catchment extending between SH1 and Dairy Flat Highway.

To the west of Dairy Flat Highway and south of Wilks Road the land is zoned Mixed Rural.

As part of the Auckland Council rural urban boundary investigations a landscape report was prepared [6]'. This outlines a general framework of landscape character and landscape sensitivity for the area. The Silverdale section of the report identifies landscape sensitivity and landscape capacity as shown in Figure 18 which also shows the structure plan area.

[6] 'The Rural Urban Boundary (North and Northwest) Option Area Landscape Evaluations Report, August 2013Environmental Planning and Design Ltd, July 2013

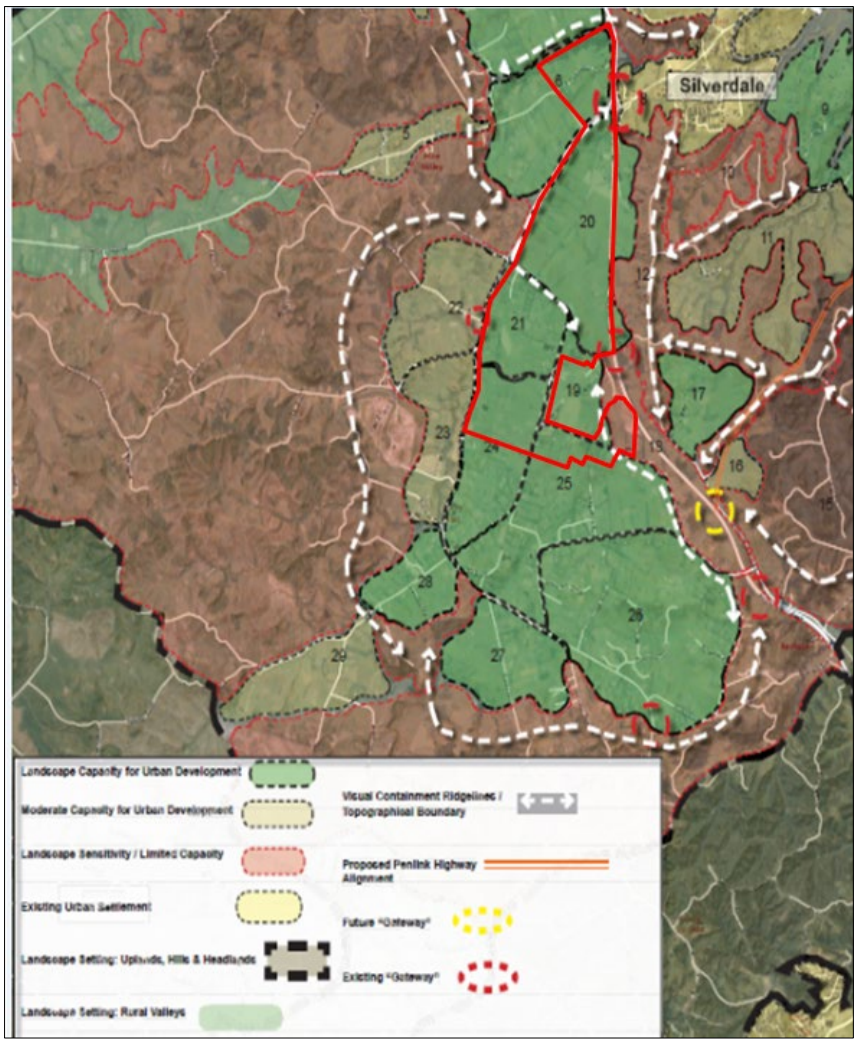

Figure 18 Landscape character and landscape sensitivity
(Source Environmental Planning and Design Ltd, 2013)

The area evaluations identify that the structure plan area has a strong capacity to accommodate urban development except for a small portion that falls within the ‘Redvale Corridor’ (area 18) to the east of the airport. This area is identified as having “strong landscape sensitivity”.

Landscape analysis was also undertaken by the former Rodney District Council in association with the draft Silverdale West Structure Plan (2010). This included the identification of views and view shafts in this area.

Further landscape work for this structure plan confirms these views and expands the analysis to include views in the part of the structure plan area to the north in the Pine Valley area.

Figure 19 shows views that can be gained into Silverdale West from SH1, Dairy Flat Highway and Wilks Road. These are from:

- SH1 which provides the most ‘open’ views, between Wilks Road and Silverdale interchange;
- Dairy Flat Highway which are less open due to reasonably dense boundary planting;
- Wilks Rd which are reasonably open with low levels of vegetation cover, consisting mainly of amenity planting around dwellings.

Figure 20 shows the most significant view shaft from SH1. This is located in the south eastern corner of Silverdale West, immediately north of the Wilks Road overbridge. In this location the topography falls away steeply from SH1, providing an opportunity to retain a view into and over the structure plan area to the hill range beyond.

The Pine Valley area is exposed to views from the Dairy Flat Highway and SH1. The land to the south of Wilks Road has variable visibility due to shelter belts and roadside and amenity planting.

Rural dwellings on the hillside between East Coast Road and SH1 have elevated views over the structure plan area, extending to the hill range beyond. The structure plan area is visually open to these residents.

The future form of the built environment should recognise and respond to the visual sensitivity of this viewing audience.

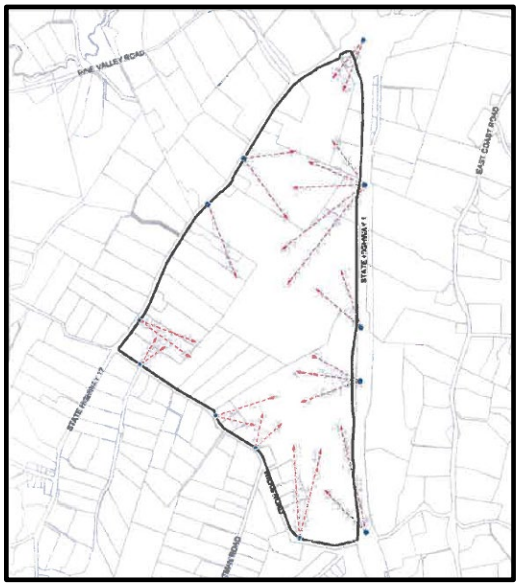

Figure 19 Views into Silverdale West

Figure 20 Silverdale West ‘most significant’ view shaft

SH1 and Dairy Flat Highway are considered to be the visual gateways to the Hibiscus Coast. The concept of a ‘gateway’ was originally identified in the draft Silverdale West Structure Plan.

The Hibiscus Coast Gateway is currently recognised in AUPOP in the Silverdale 2 and Silverdale 3 precincts located on the eastern side of SH1. Each contains targeted provisions

to protect, maintain and enhance the visual amenity of the entrance to Hibiscus Coast. A similar precinct approach might be appropriate for the structure plan area.

The overall conclusion of the landscape analysis for Silverdale West is that the development of this area will have a significant impact on the visual experience of people living near the area and to those travelling on SH1 and the Dairy Flat Highway. The matters considered critical to address in the structure plan are the area's interface with SH1 and the need to visually 'break up' the appearance of development when viewed from an elevated perspective.

More detail is provided in the Landscape Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

6.7 Ecology

This section addresses terrestrial and aquatic ecology.

More detail is provided in the Biodiversity Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

6.7.1 Terrestrial environment and fauna

This section draws primarily on earlier work carried out for the Silverdale West area and is considered to be broadly applicable to the whole structure plan area which has similar qualities and patterns of land use.

Silverdale West has been highly modified by past land use practices including forest clearance, drainage and pastoral conversion. Figure 21 shows the location of the existing vegetation in Silverdale West.

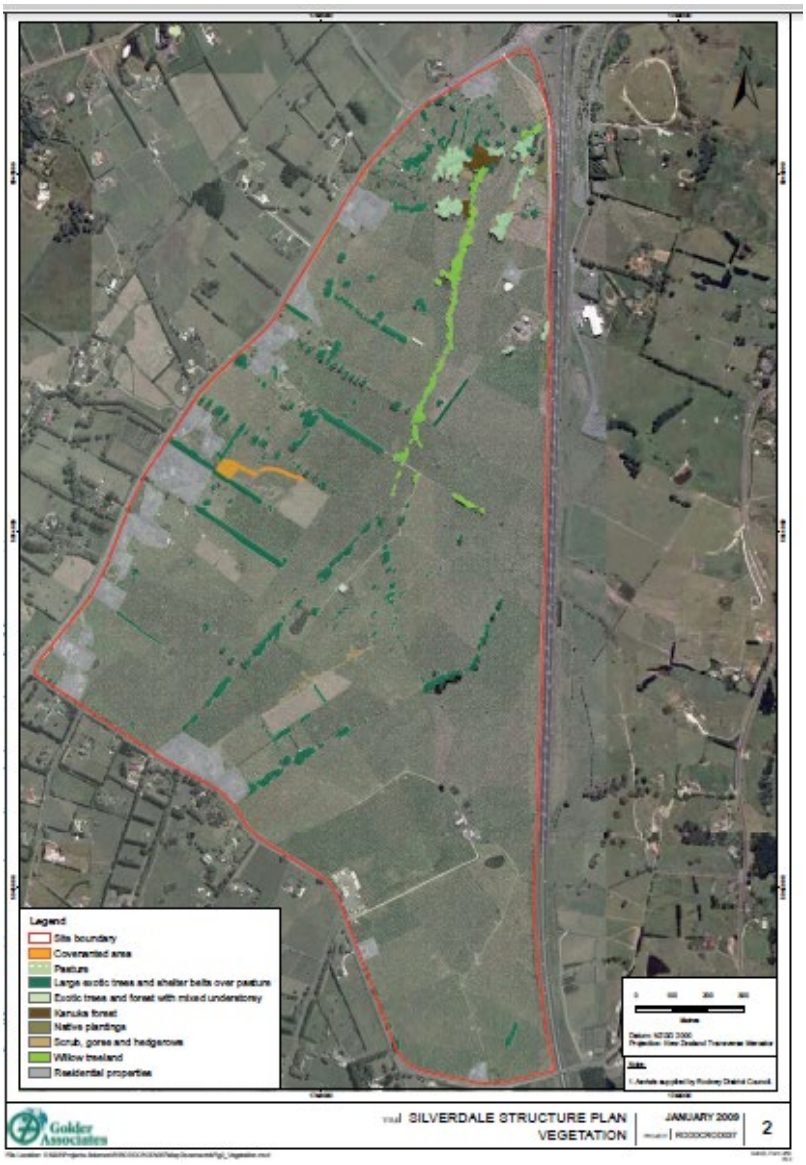

Figure 21 Existing vegetation (Source Golder 2009)

Existing vegetation in the structure plan area is typical of agricultural land use. It is predominantly exotic and includes pastureland, lone trees, hedgerows and shelterbelts. Riparian trees and vegetation are generally absent; where present they are exotic species such as poplars, willows and pine. There is a 'bush covenant' on one property in Silverdale West which protects an area of planted exotic trees in perpetuity. The structure plan area contains no listed notable trees.

Remaining native vegetation includes:

- riparian vegetation bordering the Weiti Stream in the Pine Valley East. This vegetation is identified as Significant Ecological Area1 (terrestrial) and Stream Management Area in the AUPOP.
- two small stands of remnant native Kanuka forest (approximately 0.5ha) in the northern most corner of Silverdale West. Adjoined by small areas of exotic forest.

- one naturally occurring wetland exists in the northeast of Silverdale West and contains some remnant wetland vegetation.

These remnants of native vegetation are significant taking into account the general scarcity of native vegetation in the area. They should be retained and enhanced as important components of the structure plan area.

Terrestrial fauna surveys in the report by Golder Associates (2009) identified the following fauna in the area:

- Birds: Common native and exotic birds in the area are those associated with pasture and bush margins. No habitat is identified as ‘critical. Farm ponds and wetter pasture areas could be providing seasonal habitat to the ‘At risk – declining’ pied stilt, possibly the threatened shag species including black shag, little black shag, and the threatened red-billed gull.
- Lizards: Surveys have resulted in low detection rates of native copper skinks. No lizard species that are classified as ‘at risk’ were found or are likely to be present. The area does not have any significant lizard habitat.
- Bats: Monitoring indicates long-tailed bat activity within the site. More detailed surveys would determine whether they are roosting within the area or passing through during foraging.

The structure plan area lies within the North West Wild-link ecological corridor. The North West Wild-link aims to maintain and enhance natural habitat in the corridor to act as ‘stepping-stones’ for wildlife to move between the conservation hotspots of the Hauraki Gulf Islands and the Waitakere Ranges.

The lack of native vegetation in the structure plan area is a large gap in the ecological corridor. The retention and enhancement of the existing remnant native vegetation and creation of new “stepping-stones” e.g. open space, street trees and stormwater devices, provides a strategic opportunity to make a significant contribution to biodiversity at the local and regional level.

6.7.2 Aquatic environment and fauna

John Creek located in Silverdale West is the main stream in the structure plan area. It drains to the Weiti Stream and ultimately drains to the Weiti River, Karepiro Bay and Long Bay Marine Reserve, which are identified in the AUPOP as significant ecological areas (both terrestrial and aquatic) and are a sensitive receiving environment.

The majority of the stream network in Silverdale West has been significantly modified and has little or no riparian vegetation. Many are used as farm drains and most are accessed by grazing stock and exhibit damage to streambanks and channels. Large crack willows grow in and along much the length of John Creek. Fallen willows and culverts obstruct water flow and fish passage. There are numerous ponds, both on-line and off-line. There are also

stormwater ponds along the SH1 boundary of the site. Overall, the aquatic habitat in the structure plan area is generally poor[7].

Fish surveys show fish species present in Silverdale West include long finned eels and banded kokopu.

The following actions would greatly improve the aquatic habitat within the structure plan area.

- The retirement of waterways from grazing and enhancement through riparian restoration planting will improve stream conditions and habitat and restore stream banks. Where there is riparian vegetation, better aquatic habitat is present. John Creek, towards the northern extent of Silverdale West where the two small stands of native/exotic forest are present, exhibits the best quality aquatic habitat in Silverdale West.
- Removal of ponds will result in improved water quality and improve the water quality to the main streams particularly those which are close to the headwaters of the tributaries.
- The removal and clearance of culverts and willows and weed control will improve and or restore upstream migration of fish. Weed control will also allow successful establishment of riparian margins

Development and future land uses in the structure plan area will introduce new risks of contamination to the aquatic environment within the structure plan area; and the sensitive estuarine environs of the Weiti River and Karepiro Bay. Sediments, impervious surface runoff and workplace toxins will need to be managed with a view to maintaining a healthy stream environment and aquatic habitat.

6.8 Open space and recreation

There may be open space location and acquisition opportunities within the Silverdale West Dairy Flat Industrial Area. These need to be considered in relation to the wider Wainui Silverdale Dairy Flat future urban area which will include a yet to be developed wider open space network plan. The overall open space network will have particular regard to the Parks and Open Spaces Provision Policy 2016 which informs investment decisions for provision of open space at a network scale. In particular, the provision of open space is considered on the basis of four provision measures, function, distribution, location and configuration.

The following open space related factors may influence planning for open space in and around the Silverdale West Dairy Flat Industrial Area:

- it is centrally located in relation to the wider Wainui Silverdale Dairy Flat Future Urban zone and offers north to south and east to west open space access and

[7] Silverdale West Structure Plan Ecological Constraints Analysis, Golder Associates 2009

connections as part of stormwater management and esplanade reserves e.g. greenways.

- individual elements of open space provided within the structure plan area will fit within a wider network of open spaces such as the waterway network and overland flow-paths.
- acquisition of new land in green-field areas will need to be integrated with the existing open space network and address matters such as the proximity of similar space, amenity of surrounding area, zoning, usability, topography and contiguity.

With respect to business zones and as a general statement, green infrastructure, conservation or connecting open space may offer some recreational opportunities. These may include esplanade reserves, stormwater related open space assets, and walking and cycling pathways. However, the provision of suburb and neighbourhood parks normally provided for within residential areas that serve a sport and recreational function is not anticipated.

6.9 Geotechnical and Land Suitability

The structure plan area has had a geotechnical desk top study carried out for the council as part of the Greenfield Areas for Investigation work to determine the Rural Urban Boundary (RUB) location[8]. The Silverdale West part of the structure plan area has also had a geotechnical assessment done by the former Rodney District Council for the draft Silverdale West Structure Plan[9].

There are two main geological groups in the structure plan area which are the:

- Undifferentiated Tauranga Group which includes mud, sand, gravels and muddy peat located across the lower lying gully areas;
- Undifferentiated Northland Allochthon (often referred to as Onerahi Chaos) which is highly fragmented and even at low slope angles is prone to slipping. These tend to be located on the higher ground along Dairy Flat Highway, Wilks Road and south of the airport.

The investigations for the RUB assessed the hazard potential of the land in terms of slope instability potential, liquefaction potential and soil compressibility and building settlement.

Slope instability potential is generally rated as low except for the areas around the Silverdale Interchange, east of Dairy Flat Highway and north of Wilks Road which are rated medium. In relation to liquefaction and compressibility potential, most the area is rated low for both. The areas rated medium for both factors are located in the lower valleys of Silverdale West, to the east of Postman Road and south of the airport.

[8] Geotechnical Desk Study North and North-West Auckland Rural Urban Boundary Project, Tonkin and Taylor 2013 (Part of PAUP section 32 report)

[9] Draft Silverdale West Structure Plan prepared in 2010 (Riley Consultants 2008 - Geotechnical constraints and opportunities, November 2008)

The investigations for the RUB also assessed the development premium of the land taking into account these factors. To mitigate one or more of the above-mentioned development constraints or geotechnical hazards, there would be an associated ‘premium’ or additional engineering required to develop the land compared with land which is not constrained by the same issue. A qualitative assessment was carried out to determine low, medium and high “development premium” categories to contrast the geotechnical suitability of the various areas.

It was concluded that the area has medium development premiums (see Figure 22). The parts of the structure plan area underlain by the normally difficult Northland Allochthon only have a medium development premium due to having relatively moderate slopes.

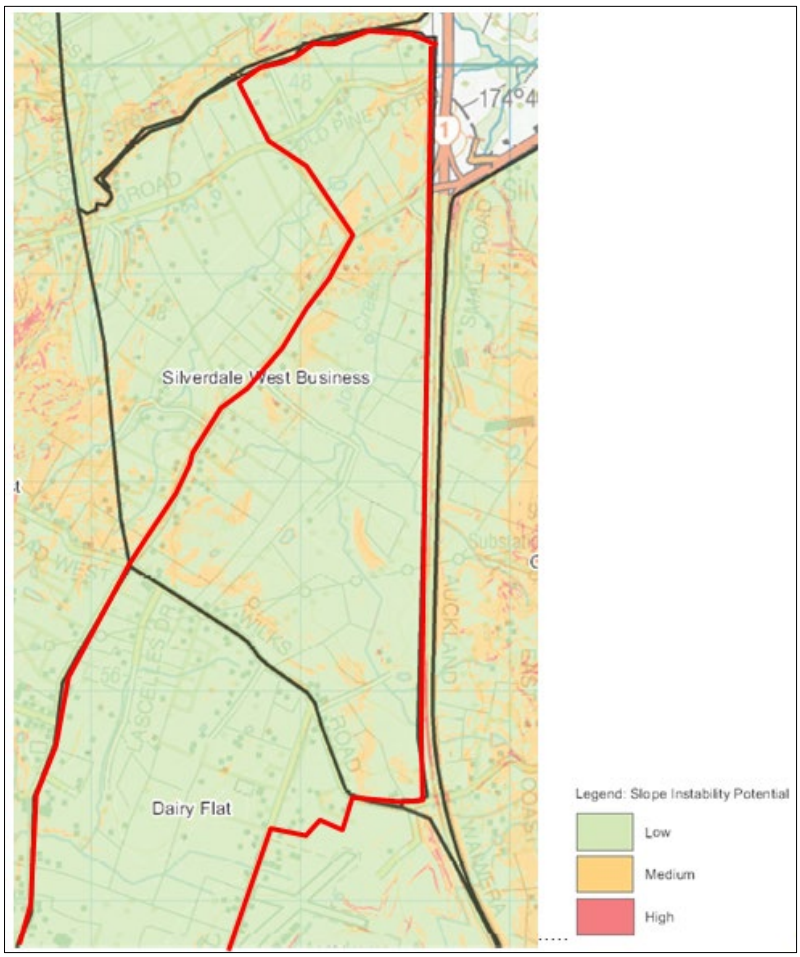

Figure 22 Development premiums
Source Tonkin and Taylor 2013

The geotechnical investigations carried out for the former Rodney District Council for the Silverdale West area classified the area into three stability constraint zones. These are shown in Figure 23. Zone 1 has low stability constraints and is generally mid slope. Zone 2 has moderate to high stability constraints and is the steeper slopes below Wilks Road and Dairy Flat Highway. Zone 3 has settlement constraints and covers the lower central flood plain area.

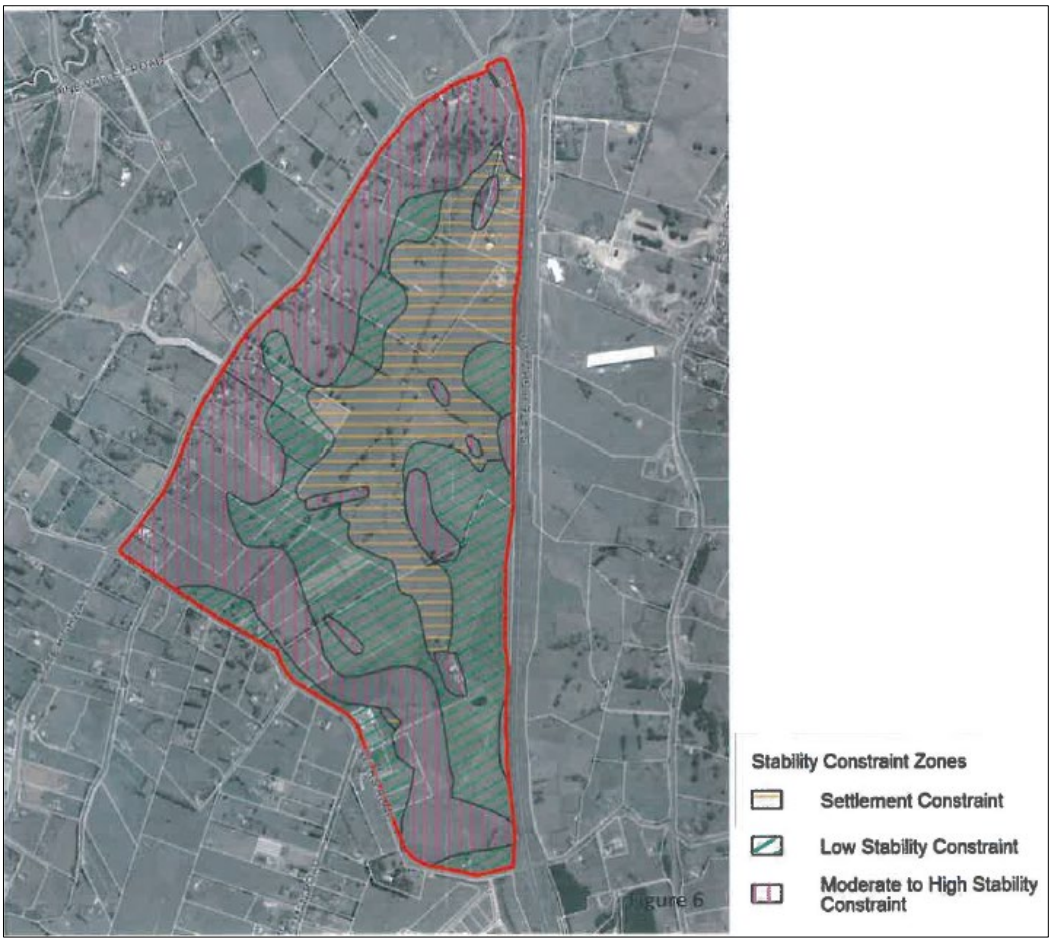

Figure 23 Stability constraint zones
Source Draft Silverdale West Structure Plan 2010

Work for a landowner in the structure plan area,[10] further identified engineering works that are likely to be needed to deal with geotechnical issues. These include shear keys, particularly on Northland Allochthon, undercutting and replacement of soils, gully filling, compaction and other techniques for soils prone to compaction, and general bulk earthworks.

The geotechnical issues identified in the structure plan area are not barriers to the development of the land. Detailed site development plans and subdivision and development resource consents will be able to address specific geotechnical issues at the time of development.

In response to the feedback a further review of the geotechnical suitability of the land by a council development engineer did not reveal a reason for the land being unsuitable for industrial development. The ground conditions comprise the Northland Allochthon plus more recent alluvial deposits. Relict shear zones/surfaces are known to be present in this material and global stability slopes would likely be below the factor of safety required for land subdivision using the Auckland Council Code of Practice for Land Development and

[10] Silverdale West Geotechnical Overview, Attachment 11 Statement of Evidence of Bayard McKenzie on behalf of Wilks Road 2014 Limited and Redvale Quarry Limited in Relation To Topic 081 – Rezoning and Precincts (Geographical Areas - Rodney) 17 March 2016)

Subdivision 2013. Whether it is a platform for an industrial site or a slope with a number of house platforms, the global instability would have to be addressed to ensure adequate factors of safety and would be by similar means, e.g. earthworks, palisade walls.

In terms of premiums involved with developing one type of land over another, similar techniques would be employed in either case. In fact, a large platform cut into a slope could potentially prove advantageous as it could remove the unstable materials/shear zones and it should be possible to arrange the building platforms in such a way as to minimise earthworks.

The council also engaged Candor3, a company experienced in land development, to undertake an assessment of the suitability of the land in the Silverdale West area, ie north of Wilks Road, for light industrial activity. This area is steeper compared to the rest of the structure plan area. Candor3 prepared concept schemes based on the draft Silverdale West Structure Plan. As part of this analysis a 3-dimensional model of the investigation area was developed to enable a better understanding of the gradients of the existing terrain and the interventions required to achieve a layout that is suitable for light industrial land.

The results of this analysis show that, using typical land development techniques, it is possible to achieve acceptable gradients for roading (maximum 8%) with most roads in the 3 - 7% range and that reasonably flat building platforms can be created which are suitable for light industrial activities. Typically, these platforms are within 1 to 3 metres vertically of each other. The height differential between these platforms can easily be managed through retaining walls, batters or combinations thereof which are commonly used in existing industrial areas such as Rosedale Road, Highgate and Highbrook.

Overall it is considered that the area of Silverdale West Dairy Flat Industrial Area located to the north of Wilks Road can be developed for light industrial/business activities in a manner consistent with other developments of this nature.

More detail is provided in the Geotechnical Background Report and the Silverdale West Dairy Flat Industrial Area Structure Plan – Land Development Assessment, Candor3, 2020 which are available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

6.10 Contaminated Land

The health and wellbeing of future communities is important and previous land uses can leave contaminated soils behind. A desktop study undertaken by the council of potential historic land use contamination has been prepared as well as a more detailed study by the landowners of particular sites. More detail is provided in the Contaminated Land Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

The council study is a high-level assessment and further detailed site-specific investigations are necessary to facilitate development. The study identified a number of properties that

have or have had potentially hazardous activities and industries on them. These include dairy farm discharges, a bus depot, horticultural activities and potential fill areas. Tonkin and Taylor (2015) carried out an investigation of land within the Silverdale West area for the owners. This report concluded that that part of the site has principally been used for pastoral farming. The main activities from farming that present contamination issues are effluent ponds and offal pits. These will need to be dealt with at the time of development of the land.

The council study also identified potential contaminated sites adjoining the structure plan area including the Redvale landfill, North Shore Airport and petrol stations. With these there is the potential for migration of contaminants into the structure plan area. With the landfill there is potential risk associated with landfill gas and odour discharges. However, the proposed zoning of the structure plan area industrial, helps mitigate these effects as high risk activities are not allowed in the industrial zone.

The council study concluded that from a contaminated land perspective, no significant development constraints existed within the structure plan area. However, site specific investigations would be required to assess risks at the time of development, and to identify requirements for mitigation measures to reduce risks, appropriate to the proposed development. The extent of remedial works required to address site specific human health and environmental risks will be dependent on the type and nature of the contamination and the proposed land use.

6.11 Cultural Values

The structure plan has been informed by contributions from mana whenua, this includes relevant Iwi Management Plans (Section 5.6), comments received at hui and through other channels (Section 4.9), and a Cultural Values Assessment (for the Supporting Growth project relating to Silverdale, Dairy Flat and Wainui) prepared on behalf of Ngāti Manuhiri (section 4.9). Ngāti Manuhiri, Ngāti Rehua, Te Kawerau ā Maki, Te Rūnanga o Ngāti Whātua, and Ngaati Whanaunga expressed an interest or have been involved in the structure plan process.

Particular sets of values influence the resource management matters iwi have expressed as being of importance. Kaitiakitanga is a central concept, meaning to exercise guardianship and stewardship of the land and environment – seeking to cultivate a healthy and sustainable environment for all. Te Ao Māori (Māori world view) articulates that the natural and spiritual world are intertwined with the concept of mauri (life force).

Cultural values have been grouped into land, water, biodiversity, wāhi tapu and taonga, and social, economic and cultural wellbeing.

Land

Land is viewed as life sustaining. Mana over land comes from the whakapapa (lineage) or association with that land.

Key resource management matters of importance expressed by iwi are impacts on natural and cultural landscape values, archaeology (and the potential lack of information around this), disturbance of contaminated land, erosion and vegetation clearance.

Water

Water is valued significantly. Mauri, binding the physical and spiritual, sustains all life and is strongly present in water. The life-giving capacity is therefore an important measure for the health of a waterway, along with its capacity to produce food. Key resource management matters of importance expressed by iwi are the existing or potential degradation of waterways (e.g. from culverts, contaminant runoff, increased impervious surface), effects on Weiti in particular from increased sedimentation and the presence of physical structures, loss of natural waterbody flows, increased flooding risk, advocating for the adherence to water sensitive design for stormwater management, protection of the coastal marine area, access to waterways and the coast, focusing on enhancement and rehabilitation of waterways rather than maintenance only, and the use of innovation in the capture and retention of rainwater.

Biodiversity (vegetation, terrestrial fauna, aquatic environment and fauna)

Native flora and fauna are a part of the heritage of iwi, and biodiversity is seen as being part of the health and wellbeing of iwi. Key resource management matters of importance expressed by iwi are the degradation and loss of habitat for native fauna, fragmentation of green space and ecological corridors (particularly the North West Wild-link), concerns about the introduction of exotic plant species for landscaping and exotic animals, loss of cultural and food resources, disruption to native bird nesting, protection of SEA's, increased riparian margins and concerns around fish passage.

Wāhi tapu (sacred place or site) and taonga (treasure)

Sacred places or sites, artefacts, tikanga or traditions form the cultural landscape of iwi. It is important to protect all wāhi tapu or taonga which are currently known, but also to acknowledge that there may be undiscovered taonga. Interpretation of any heritage is to the discretion of iwi. Development should avoid all sites of value, and Accidental Discovery Protocols used through the earthworks process or any ground disturbance.

Social, economic and cultural wellbeing

Sustainable management includes the provision of social, economic and cultural wellbeing of iwi. Over time resources have been depleted, and the physical association of iwi to their land has reduced. It is important to iwi for their identity with the land to be fostered, and for their people to live and work within their ancestral area. Greater recognition of iwi in the area is also sought, through customary rights, iwi commercial investment, traditional naming and cultural markers, infrastructure design, more sustainable outcomes, among other matters.

6.12 Historic Heritage

There are no AUP Historic Heritage or Special Character overlays identified in the structure plan area. There are two places that are considered to have historic heritage significance. One is the Wēiti portage and overland path known as Te Taruna, the other is the site of Maurice Kelly's house, Sawyers Arms inn, stables and related buildings.

The area otherwise has few identified places of historic heritage interest. This reflects in part the nature of the environment, which largely lacked resources that would have attracted pre-European Māori settlement. During the post-European period, the land was sparsely settled until the 20th century because the land was owned and occupied for many years by a single family (the Kelly family). The settlement of Silverdale, formerly known as Waiparaheka, and later as Wade on the north bank of the Wēiti River was the main focus of settlement in the district in the historic era.

6.12.1 Te Taruna

Pine Valley, at the northern end of the study area, was the location of a traditionally important overland pathway and canoe portage between the east and west coasts known as Te Taruna. There is unlikely to be any surface indication of this pathway and portage. However, subsurface archaeological evidence of Māori use of this route and/or occupation of the alluvial stream flats along the Wēiti Stream (originally known as the Taruna Stream) may potentially be present in this area. No surface archaeological evidence was observed during a partial walkover survey undertaken for this study. However, not all properties were able to be accessed and the absence of surface evidence does not preclude the possibility of subsurface evidence being present.

6.12.2 Maurice Kelly's house, Sawyers Arms inn, stables and related buildings

The land within the structure plan area was settled and occupied by the Kelly family for most of the 19th century from at least 1852. Maurice Kelly's homestead, Sawyers Arms Inn and associated buildings were located at 1636 Dairy Flat Road on what was once the original Great North Road, near the intersection of several early paths. Kelly's Inn was widely known as a waypoint on the road, a place of accommodation for travellers, and a focus for community activities.

The site of these buildings is not scheduled in the Auckland Unitary Plan. Scheduling is not considered the most appropriate way of managing the site. The site of the Kelly buildings complex occupies a significantly large geographical area and scheduling of the site would not provide reasonable use of the land into the future. The recommended option is for development and management of the land to be undertaken under the archaeological provisions of the Heritage New Zealand Pouhere Tāonga Act. This would be the responsibility of the property owner and Heritage New Zealand.

6.12.3 Other historic heritage places

There is a low or very low likelihood of archaeological evidence of pre-European Māori occupation being found within the balance and majority of the structure plan area south of Pine Valley flats. The environment in this part of the area would not have been attractive for Māori horticulture or settlement and is likely to have remained predominantly in kauri forest until the arrival of Europeans. No archaeological sites of Māori origin have been recorded during surveys that have been undertaken in or adjacent to the area.

The majority of the area is likely to have been logged for kauri during the 19th century, and suitable locations would have been dug for kauri gum. It is possible that archaeological sites associated with the kauri timber industry or with gum digging are present within the study area, particularly within areas that have not been subject to archaeological surveys. However, these activities were largely ephemeral in nature and physical evidence may not have survived subsequent farming and development activities. The principal settlements associated with gum digging are known to have been located outside the area.

A second 19th century hotel, owned by Maurice Kelly's son, is known to have been located within the area. The Wade Junction Hotel, built in 1879, was destroyed by fire in 1885 and was not rebuilt. The likely location of the hotel has been recorded as an archaeological site.

No standing buildings or structures of high historic heritage significance have been identified within the structure plan area. Several cottages, villas and bungalows have been identified, in particular there are two cottages in close proximity to each other on Dairy Flat Highway that appear to date from the early 20th century. These residences are considered to be of some local historical significance though are otherwise typical rural dwellings of the late 19th/early 20th century.

More detail is provided in the Heritage Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

6.13 Airport

The North Shore Airport is not located within the structure plan area, but it is surrounded on three sides by it. The airport is an important piece of regional infrastructure and enabling it's on going operation is important. The AUPOP in the Regional Policy Statement, Chapter B3.2 on significant infrastructure, addresses the issue of managing reverse sensitivity effects on significant infrastructure and requires where practicable to avoid or otherwise remedy or mitigate adverse effects of development on the infrastructure.

The identification of business land around the airport in the FULSS 2017 is to help mitigate reverse sensitivity effects on the airport. There is therefore the opportunity to utilise the land to help meet the need for business land in the north and enable the continued operation of the airport.

The North Shore Aero Club owns and operates the airport. It has 545 members and 185 aircraft registered at the field. The airport is an important flight training facility and the

student numbers increased by 40% in the 2017-2018 year. There are also nine aviation related businesses operating on the airport including Great Barrier Airlines, Sun Air and Commercial Helicopters. It is also home of Northland Emergency Rescue Trust's 3 helicopters.

The sealed main runway is 791m long and 9m wide and extends in a north east/south west direction. It is paved, lit and has instrument approaches. There is also a smaller east west gravel cross runway.

The AUPOP recognises the airport and it is zoned Special Purpose Airport Zone and is covered by the North Shore Airport Precinct. The precinct provides for the continued operation of the airport, including aircraft operations, maintenance and repair of aircraft, and limited provision for commercial and industrial activities associated with aviation.

The AUPOP also includes an Airport Approach Surface Overlay and an Aircraft Noise Overlay. The Airport Approach Surface Overlay provisions manage the height of activities in the overlay. As can be seen from Figure 24 the Airport Approach Surface Overlay covers most of the structure plan area. The Aircraft Noise Overlay controls activities sensitive to aircraft noise within air noise contours. It applies to a much smaller area than the Approach Surface Overlay with the outer 55dB Ldn noise contour covering most of the southern part of the Postman Road area and extending to the south west to part of the Future Urban zone in the Blackbridge Road area. The inner 65dB Ldn noise contour affects very little of the structure plan area (see Figure 25).

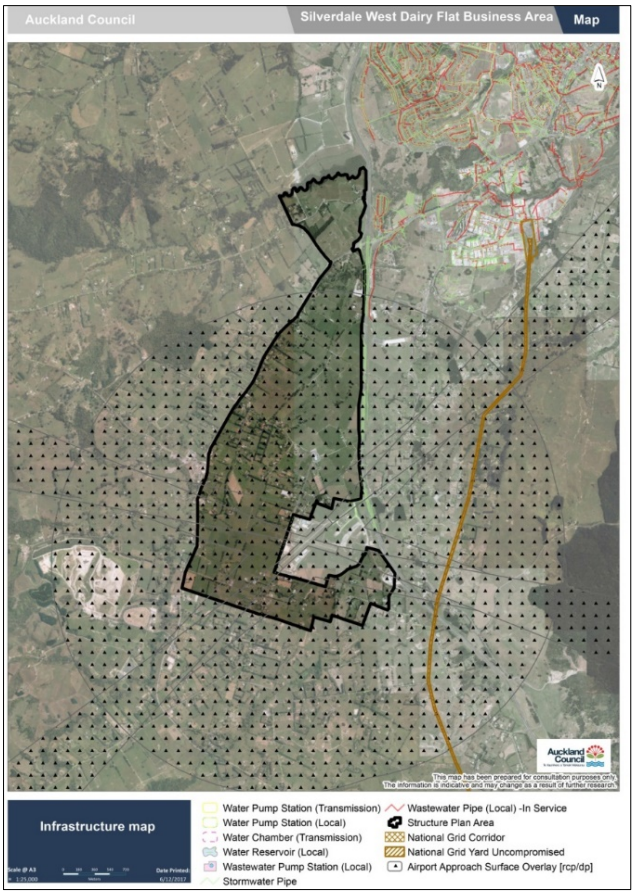

Figure 24 Airport approach surface overlay

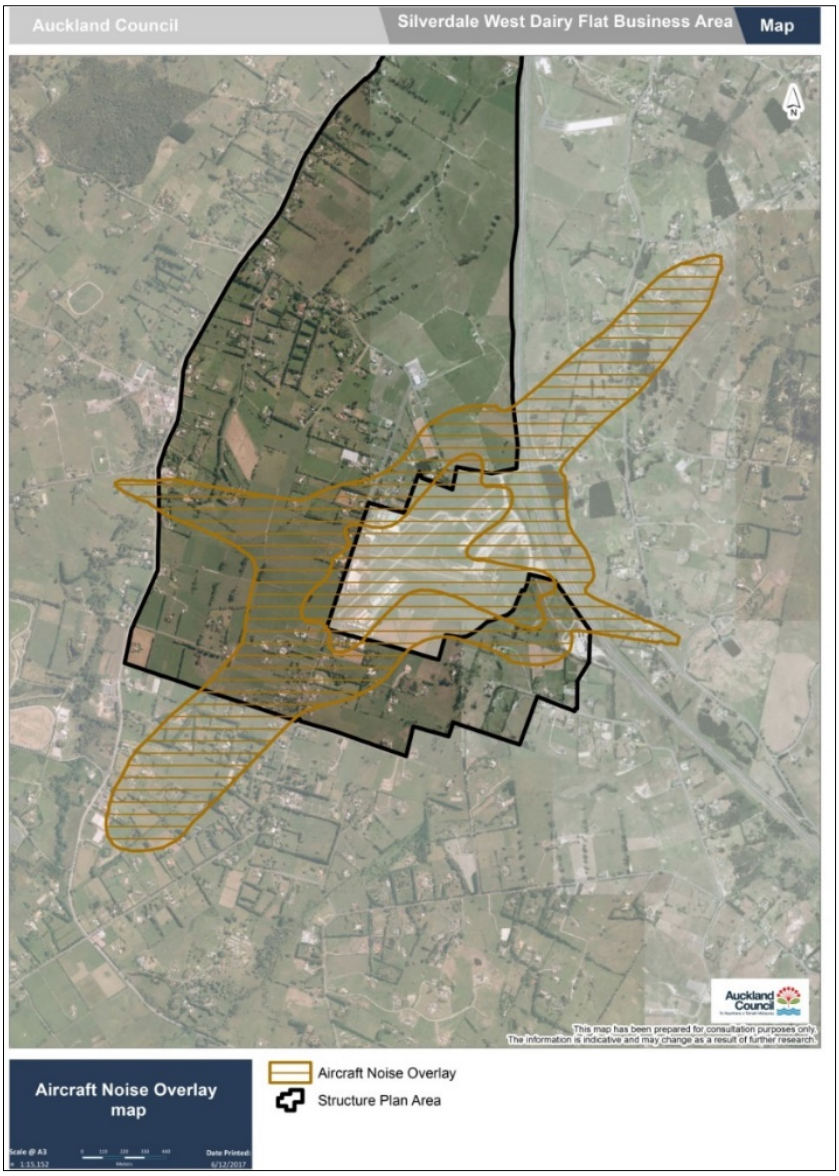

Figure 25 Aircraft noise overlay

The Aero Club is concerned about development around the airport for two main reasons. The first is safety and the Aero Club seek that emergency landing areas be identified at either end of the runway which should be clear of structures including trees and/or landscaping. The second issue raised is reverse sensitivity arising from noise, particularly for residential and other noise sensitive activities.

The identification of industrial land around the airport, and the Airport Approach Surface Overlay and the Aircraft Noise Overlay described above are appropriate mechanisms to enable the ongoing operation and development of the airport.

The Aero Club sees the airport as becoming a significant regional transport asset and hub. It has future growth aspirations which include:

- Widening and lengthening the sealed runway to 1100m (1540m including safety strips) to accommodate 50 passenger aircraft such as the Bombardier Q300.

- Provide infrastructure and facilities for passenger traffic, servicing and maintenance of aircraft, freight.
- Improved flying schools.

The runway extension would mean the Club would have to acquire additional land and Postman Road would also need to be realigned. If this were to occur the Airport Approach Surface Overlay and the Aircraft Noise Overlay would also need to be extended.

At the time of preparing this structure plan (2020) the Airport did not have the necessary approvals and had not purchased any land to expand the airport. Therefore, it is not appropriate for the structure plan to recognise an expansion in the structure plan. The structure plan has however flagged the aspirations of the Airport operators and recognise that the Airport's plans would need to be reviewed at the time of preparing the plan change for Stage 3.

Extending the runway would mean crossing the alignment of Postman Road and the east west collector to the south of the Airport. The ITA shows an option (see Figure 26) of how the structure plan road network could potentially be adapted to respond to an airport expansion with the realignment of Postman Road and the relocation of the east-west collector road south of the Airport further south to make way for a runway expansion.

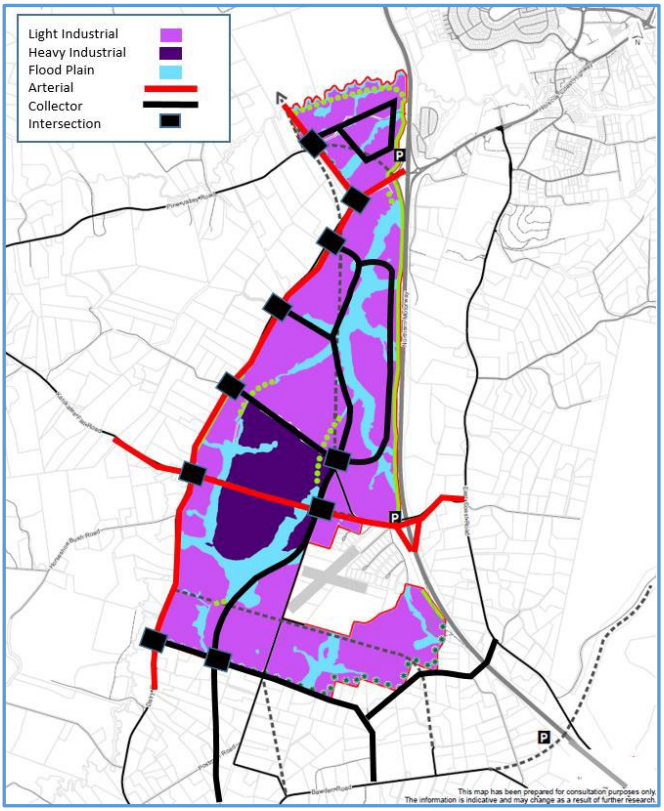

Figure 26 Possible airport expansion road network

More detail is provided in the Airport Report which is available on the council web site under the Silverdale West Dairy Flat Industrial Area Structure Plan.

6.14 Health

The urban environment is a key determinant of health and wellbeing. This section considers the health of the community that will visit and work in the structure plan area. There are several ways that the structure plan and the future land uses can promote the health, safety and wellbeing of people and communities.

6.14.1 Employment

The provision of local employment opportunities, in close proximity to residential areas, means that less time is spent commuting with more time able to be spent on other activities such as with families. Local employment also means less stress associated with long commutes. It also gives people more choices about how they get to work eg walking and cycling or using public transport.

Being able to get around easily and achieve employment goals contributes to a person's ability and motivation to participate in and enjoy community and civic life.

6.14.2 Active Travel and Connectivity

Integration of land use and transport planning in the structure plan area provides the opportunity to design a transport system that supports better travel choice and options for travelling by walking, cycling or public transport. These modes are expected to make up 20-25 per cent of all trips within the structure plan area and will have significant health benefits through increased physical activity.

The transport network has been designed with people and places in mind, not just moving vehicles. The open space and riparian corridors will provide high-amenity connectivity for cycling and walking with the corresponding health benefits from a more active community. The proposed design of the road and cycle network, with the separation of cyclists from the traffic lanes and the separation of cyclist and pedestrians on the walking and cycling routes also contributes to the experience, health and safety of the users.

Access to public transport adds to the choices people have in getting to work and may reduce the stress of getting to work.

6.14.3 Safety

The transport system serving the structure plan areas seeks to minimise harm to people and the environment. In addition to the separation of pedestrians and cyclists from the traffic lanes, the use of traffic lights at most main intersections rather than roundabouts increases the safety of cyclists and pedestrians by providing signalised crossings for them.

The 20-25 per cent share of all trips by walking, cycling and public transport contributes to a reduction in the use of fossil fuels. This reduces the pollutants and particulate emissions

from vehicles and road dust that impact on air quality and harm people's health.

6.14.4 Open and Green Spaces

Public spaces and places help us connect with others and with our surroundings, offer respite from the pressures of daily life and are part of a holistic approach to wellbeing. Spaces for everyday interactions with others helps create positive relationships, increase our perception of safety and contribute to our sense of community.

The riparian and open space network contributes to the wellbeing of workers by providing a pleasant working environment and places to relax or walk and cycle in breaks.

Having roads fronting areas of open space enhances the safety of people using the open space from increased surveillance.

6.14.5 Hazards

The identification of industrial land use, as opposed to residential, on the land around the North Shore Airport is specifically to protect people from noise effects of the airport and to reduce reverse sensitivity noise effects on the airport operation.

There is also an additional layer of control in terms of noise with the Aircraft Noise Overly which controls sensitive activities within air noise contours. This is discussed in more detail in section 6.13 on the airport.

The industrial zone also limits sensitive activities e.g. childcare, to avoid the adverse effects from industry. It also means that these activities are not subject to airport noise.

Noise limits also exist to reduce adverse effects of noise within the industrial zones.

The heavy industry zone is buffered by light industry to reduce the adverse effects on adjoining residents. The industrial zones also control noxious or offensive hazardous activities to protect adjoining land uses and people within the zones.

Through the site-specific land development process land contamination will be assessed to determine if there are any hazardous substances on the site and if so identify methods for remediation.

Appendix 1 – Supporting documents

List of supporting technical reports to the Silverdale West Dairy Flat Industrial Area Structure Plan. All reports are available on the Silverdale West Dairy Flat Industrial Area Structure Plan on the council website.

Report Title	Author	Date
Background and Specialist Topic Reports		
Draft Silverdale West Dairy Flat Industrial Area Structure Plan Feedback Report	Auckland Council	August 2019
Draft Silverdale West Dairy Flat Industrial Area Structure Plan	Auckland Council	March 2019
Draft Silverdale West Dairy Flat Business Area Structure Plan Background Report	Auckland Council	December 2017
Business land assessment	Market Economics Consulting	17 May 2018
Integrated Transport Assessment	Te Tupu Ngātahi, the Supporting Growth Alliance	March 2019
Water and wastewater topic paper	Watercare	January 2019
Landscape Topic Report	Bridget Gilbert	February 2019
Biodiversity Topic Report	Alison Pye (Principal Planner) North West and Islands Rue Statham Senior Ecologist (North/West) Environmental Services – Infrastructure & Environment	December 2017

Stormwater Management Plan	Opus Healthy Waters	November 2018
Historic Heritage Topic Report	Robert Brassey (Principal Specialist Cultural Heritage) Cara Francesco (Specialist Built Heritage), Plans and Places Department	December 2017
North Shore Airport Topic Report	Dave Paul (Principal Planner) North West and Islands	December 2017
Funding Plan	Alan Hanley (Infrastructure Funding Agreements Specialist), Auckland Council	March 2019
Geotechnical Topic Report	Complied by Dave Paul (Principal Planner) North West and Islands from several geotechnical reports	December 2017
Land contamination Technical memorandum	Barton Bauzon (lead) and James Corbett Engineering & Technical Services Simon Court, Manager Closed Landfills & Contaminated Land Response Engineering & Technical Services	12 September 2018
Silverdale West Dairy Flat Business Area Structure Plan – Land Development Assessment	Candor3	March 2020
Consultation Summary Reports		
Engagement Summary	Kimberley Edmonds, Planner, Auckland Council	April 2018
Silverdale West Dairy Flat Industrial Area Structure Plan Response to feedback on the Draft Structure Plan	Auckland Council	April 2020

Appendix 2 – Addressing the Structure Plan Guidelines

The Auckland Unitary Plan contains a set of Structure Plan Guidelines in Appendix 1 (of the Auckland Unitary Plan). The table below identifies the matters in the guidelines and where each of these matters are addressed in this report:

Auckland Unitary Plan Operative in Part Appendix 1 Structure Plan Guidelines 1.3 External documents to be taken into account When preparing structure plans, the external documents in the following list are to be considered where appropriate		**Structure Plan Section Reference**
(1)	Auckland Plan, including the directions of the Auckland Plan to be considered as an integrated whole, Auckland's High-Level Development Strategy (refer to section D of the Auckland Plan), and any sub-regional analyses prepared by Auckland Council.	2.1.1, 2.1.2, 5.1
(2)	National policy statements and national environmental standards including but not limited to the New Zealand Coastal Policy Statement, the National Policy Statement for Freshwater Management and the National Environmental Standards for Electricity Transmission Activities.	5.5
(3)	This Plan, in particular the regional policy statement	5.4
(4)	Auckland Council's 10-year budget (the Long-Term Plan) and implementation programmes.	5.3
(5)	Local board plans and area plans.	5.8
(6)	Existing integrated catchment management plans and associated network discharge consents.	4.8, 6.5
(7)	Strategies, plans, codes of practice or programmes of economic, environmental, social and cultural infrastructure providers, with particular regard to the Regional Land Transport Plan, Auckland Transport's Integrated Transport Programme and Watercare's Asset Management Plan.	4.3, 6.2,
(8)	Iwi planning documents.	5.6, 5.10
(9)	Treaty settlement legislation	
(10)	Auckland Council's Parks and Open Space Strategy Action Plan.	6.8
(11)	Auckland Council's Auckland Design Manual.	4.12
(12)	Auckland Council's Code of Practice for Land Development and Subdivision.	6.9, 6.10

Auckland Unitary Plan Operative in Part Appendix 1 Structure Plan Guidelines 1.4 Matters to identify, investigate and address A structure plan is to identify, investigate and address the matters set out below.		**Structure Plan Section Reference**
1.4.1 Urban growth		
(1)	The future supply and projected demand for residential and business land in the structure plan areas to achieve an appropriate capacity to meet the sub-regional growth projections in the Auckland Plan adopted under the Local Government (Auckland Council) Act 2009.	2.1.1, 2.1.2, 5.1

(2)	The phases and timing for the staged release of greenfield land or the staged conversion of land within the existing urban area to a more intensive activity for urban development or for comprehensive redevelopment, in coordination with infrastructure.	5.2, 4.13
(3)	The location, type and form of the urban edge, its appropriateness to the structure plan area and the surrounding area and how transitions between the area to be urbanised and other areas with different activities, building types and densities or levels of intensity are to be managed.	4.6, 6.6
(4)	Linkages and integration with existing urban-zoned and/or rural-zoned land adjoining the structure plan area through careful edge or boundary treatment.	4.6, 6.6
(5)	Opportunities to improve access to landlocked parcels, including Māori land.	N/A
1.4.2 Natural Resources		
(1)	The protection, maintenance and enhancement of natural resources, particularly those that have been scheduled in the Unitary Plan in relation to mana whenua, natural resources, and the coastal environment.	4.7, 4.8, 6.5, 6.6
(2)	Demonstrate how proposed subdivision, use, and development will protect, maintain and enhance the values of the resources identified in 1.4.2(1) above.	4.7, 4.8, 6.5, 6.6
(3)	The integration of green networks (such as freshwater and coastal water systems, and ecological corridors) with open space and pedestrian and cycle networks, showing how they reflect the underlying natural character values and provide opportunities for environmental restoration and biodiversity.	4.7, 4.8, 4.3, 6.2, 6.5, 6.6,
(4)	Measures to manage natural hazards and contamination.	6.9, 6.10
(5)	The location of mineral resources and how access to regionally significant extractable deposits is to be managed.	N/A
1.4.3 Natural and built heritage		
(1)	The existence of natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, mana whenua, natural resources, coastal environment, historic heritage and special character.	4.6, 4.9, 4.10, 6.7, 6.11, 6.12
1.4.4 Use and activity		
(1)	Contribution to a compact urban form and the efficient use of land in conjunction with existing urban areas to give effect to the regional policy statement.	4.2, 6.1
(2)	The adoption of standard Unitary Plan methods and provisions where possible to ensure a consistent approach across the region by all of the following:	4.2
(a)	seeking to avoid the introduction of additional zones;	4.2
(b)	recognising the values of natural heritage, mana whenua, natural resources, coastal, historic heritage and special character through identification of sites or places to be scheduled and the use of existing overlays in the Plan; and	4.9, 6.11
(c)	recognising specific place-based provisions through the use of precincts.	To be determined

(3)	Establishment of new centres and the expansion of existing centres in ways that complement the hierarchy and network of existing centres. Centres should be located and designed to maximise access by walking, cycling and public transport.	N/A
(4)	A mix of residential intensities sufficient to support the vitality of centres and communities and to provide housing and transport choice.	N/A
(5)	A mix and distribution of land uses within the structure plan area to provide opportunities for business activities and employment, community facilities and open space close to where people live.	N/A
(6)	The location and protection of infrastructure and management of reverse sensitivity effects on infrastructure from subdivision, use and development.	4.11, 6.13,
(7)	The location and protection of use and development and management of reverse sensitivity effects on use and development.	4.11, 6.13, 4.6, 6.6
1.4.5 Urban Development		
(1)	A desirable urban form at the neighbourhood scale including all of the following:	
(a)	a layout providing pedestrian connectivity with a network of streets and block sizes which allow for a choice of routes particularly near centres and public transport facilities;	4.3, 6.2
(b)	provision of a diversity of site sizes within blocks to enhance housing choice, accommodate local small-scale community facilities and where appropriate enable a range of business activity and mixed use;	N/A
(c)	provision of open spaces which are highly visible from streets and of a scale and quality to meet identified community needs	4.6, 4.12, 6.8
(d)	appropriate transitions within and at the edge of the structure plan area between different land use activities, intensities and densities	4.6, 6.6
(e)	the application of an integrated storm water management approach within developments to reduce impacts on the environment while enhancing urban amenity.	4.8, 6.5
1.4.6 Transport networks		
(1)	Integration of land use and development within the local and strategic transport networks	4.3, 6.2
(2)	Layout of the transport network and facilities in a manner that is safe, attractive, efficient, and resilient to hazards, well connected to local facilities and integrated with land uses, the surrounding area and the wider transport network	4.3, 6.2
(3)	Support for transport and accessibility that is multi-modal and interconnected with an appropriate number and location of access points.	4.3, 6.2
(4)	Transport effects on land uses and the management of these effects.	4.3, 6.2
1.4.7 Infrastructure		
(1)	The location and protection of existing and planned infrastructure, including network infrastructure corridors.	4.3, 6.2, 4.11, 6.13
(2)	The location, scale and capacity of existing and new infrastructure to serve the structure plan area.	4.3, 4,4, 4,5, 6.2, 6.3, 6.4

(3)	The location, scale and function of stormwater management facilities based on the principles of an integrated stormwater management approach, including the retention of natural water systems and the primary use of onsite flow and quality controls (and related impervious area limits) to manage stormwater runoff from proposed sites and roads.	4.8, 6.5
(4)	The location, scale, function and provision of community facilities, including educational, health, welfare and cultural facilities and open space to cater for the needs of communities in the structure plan area and neighbouring areas.	6.8
1.4.8 Feedback from stakeholders		
(1)	Feedback from landowners, infrastructure providers, council controlled organisations and communities gained through consultation during the structure planning process.	2.3

Auckland Unitary Plan Operative in Part Appendix 1 Structure Plan Guidelines 1.5 Specialist documents to support the structure plan and plan changes process The scale and detail of the investigation and reporting required needs to be at a level appropriate to the scale of the area subject to the structure planning process and the complexity of the issues identified by the process. Reports may be required on the matters listed below to support the structure planning and plan change process.		**Structure Plan Section Reference**
(1)	**Land use:**	
(a)	evaluation of the identified role of and principal objectives for the structure plan area in terms of land uses and amenity values;	3, 4.2, 6.1
(b)	assessment against any relevant sub-regional spatial plan; and	5.2
(c)	analysis of anticipated land use supply and demand informing the spatial allocation of areas for different activities, intensities and densities.	4.2, 6.1
(2)	**Infrastructure:**	
(a)	integrated catchment management plan - stormwater management plan, including network plans, updates to catchment or zone management plans and variations to existing or new network discharge consents, where relevant;	4.8, 6.5
(b)	integrated transport assessment;	4.3, 6.2
(c)	water and wastewater servicing plan; and	4.4, 4.5, 6.3, 6.4
(d)	other infrastructure plans.	N/A
(3)	**Impact on natural and cultural values:**	
(a)	landscape assessment	4.6, 6.6
(b)	assessment of effects on the cultural well-being of people and communities who have relationships with the area, including where appropriate mapping of local history and whakapapa;	4.9, 6.11
(c)	archaeological, historic heritage and special character assessment;	4.10, 6.12
(d)	natural heritage assessment; and	4.7, 6.7
(f)	freshwater and ecological assessment.	4.7, 6.7, 4.8, 6.5
(4)	**Environmental Risk**	

(a)	geotechnical assessment	6.9
(b)	land contamination and mediation assessment; and	6.10
(c)	health impact assessment	6.14
(5)	**Implementation**	
(a)	staging plan	4.13
(b)	Funding plan	4.14
(c)	Affordability assessment	N/A
(d)	Neighbourhood design statement	4.12
(e)	Other documents depending on the characteristics of the land and water resources of the area	Appendix 1

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