

ARDMORE BUSINESS PARK DRINKING WATER SERVICING REPORT

**Ardmore
Auckland**

KNIGHT INVESTMENTS LIMITED
December 2025 | Final R2



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EXECUTIVE SUMMARY

This Water Supply Servicing Report provides a high-level technical assessment of potable water supply requirements and servicing options to support the Fast-Track referral application for the proposed Ardmore Business Park ('the Project').

The project comprises:

- A net developable area will be between 193-267 hectares.
- A likely gross floor area for future activities/buildings between 67 hectares and 130 hectares, with additional land also for yards, individual site landscaping and car parking etc.

Based on the above the Project is likely to accommodate 4,500-5,000 employees.

Water supply options have been evaluated based on anticipated demand, source availability, regulatory pathways, and the Water Services Act 2021. Roof water harvesting along with on-site treatment and storage, is expected to provide a reliable and compliant water supply.

The assessment indicates that the Project Area will likely fall within the Large Supply category under the Drinking Water Quality Assurance Rules 2022, enabling only one compliance pathway. A centralised water supply system is feasible and can be staged to align with development growth over time.

A high-level treatment process flow diagram has been developed, incorporating screening, filtration, UV disinfection, chlorination and treated water storage. Potable water will be reticulated to each warehouse building and ancillary facilities.

Registration of the supply with Taumata Arowai will be required, along with development of a Water Safety Plan.

Overall, a local, centralised and scalable water supply system is feasible and aligns with regulatory requirements, best practice, and the Project's Fast-Track framework.

1 INTRODUCTION

This technical report has been prepared to support a fast-track referral application for the proposed Ardmore Business Park ('the Project').

Knight Investments Ltd proposes an industrial development across the Project Area for the Ardmore Business Park using the Fast Track Approvals Act 2024 ("FTAA"). The Project will include buildings, associated infrastructure, internal roads, stormwater systems, and reticulated water and wastewater services.

This report provides a high-level assessment of potable water supply servicing, including water demand estimates, source assessments, treatment requirements, regulatory compliance, and indicative infrastructure needs.

The Project Area (including individual sites) is identified in Appendix B.

2 PURPOSE AND SCOPE OF REPORT

This Water Supply Servicing Report provides a high-level assessment of water supply requirements for the project. The report addresses:

- Water demand modelling based on TP58 and industry standards.
- Assessment of available water sources (roof water).
- Water supply servicing philosophy.
- Indicative water treatment requirements and infrastructure needs.
- Compliance with the Water Services Act 2021 and Drinking Water Quality Assurance Rules 2022.
- Regulatory and consenting pathways under the Fast-Track Approvals Act 2024.

The level of detail is consistent with the requirements for a Fast-Track referral application and will be developed further during the substantive application stage.

3 EXISTING ENVIRONMENT

The Project is located to the north-east of Papakura, in an area currently used for rural residential and agricultural activities. Water supply to surrounding properties is typically provided via a combination of:

- Roof water collection and storage tanks.
- Private bores (groundwater abstraction).
- Private treatment systems.

There is no reticulated Watercare potable supply in the area.

No site-specific water quality data has been undertaken at this stage. Initial water quality information will be obtained prior to detailed design to inform treatment plant requirements.

4 PROPOSED DEVELOPMENT

The Project Area is approximately 511 hectares.

Of this total, it is anticipated that:

- a. The net developable area will be between 193-276 hectares, which excludes significant ecological areas ("SEAs"), streams, stormwater management areas and that part of the Airport either used for existing operations/runways or already under construction.
- b. The likely gross floor area for future activities / buildings would be between 67 hectares and 136 hectares, with additional land required for yards, individual site landscaping and car parking etc.
- c. Based on the above the Project is likely to accommodate 4,500-5,000 employees.

Water supply demand will primarily arise from:

- Potable water use (drinking, kitchen, hygiene).
- Ablution and amenity facilities.
- Limited process/wash-down water associated with dry industry activities, meaning activities that do *not* involve water-intensive industrial processes (e.g., food or beverage processing, continuous washing operations, chemical processing, or other processes that generate large volumes of wastewater).

5 BASIS OF DESIGN

Water demand for the Project has been estimated based on the projected development areas and an assumed daily occupancy per unit area. A flow allowance of 40 L/person/day has been applied, reflecting the installation of full water-saving devices.

For the purposes of this assessment, a employee population of up to 5,000 persons has been adopted to test the capacity of the proposed water supply system. This figure represents a reasonable upper limit planning scenario rather than a fixed or consented limit and is intended to demonstrate that the water supply system can adequately service the anticipated scale of development under high-occupancy conditions.

A likely gross floor area for future activities / buildings is up to 136 hectares, accommodating a mix of commercial and industrial activities. The remaining land will be used for yards, landscaping, car parking, internal roading, accessways, and supporting infrastructure such as fire water storage and utilities.

For the purposes of this assessment, all warehouses have been assumed to have a floor area of 10,000m² each. It is accepted that the final form of development may involve a larger number of smaller roofs or a smaller number of larger roofs. The exact configuration of development and the size of each component part makes no difference to the water generated from roofs.

An additional allowance of 30 m³/day has been included to cover other ancillary commercial activities like cafes, dairies, service stations, etc.

6 WATER SUPPLY AND DEMAND ASSESSMENT

Drinking water will be exclusively sourced from rainwater harvesting.

The applicant is working with Watercare on the availability for public supply. However, the ability to provide “self-servicing” is a viable option for the Project. For the purposes of this high-level assessment, only a proportion of buildings are assumed to be connected to the initial rainwater harvesting system, as build out will happen sequentially over time. This initial phase will also act as a “proof of concept”, demonstrating that the development can meet its potable water requirements without reliance on external reticulated supply. Under the 30% connected-roof scenario, harvested rainwater comfortably exceeds the daily potable demand of 230 m³/day, confirming the viability of the proposed supply approach.

Firefighting storage will be evaluated at the time of the substantive application. An additional 24-hour storage capacity will likely be needed. This can be supplied from an additional treated water tank, or alternatively from additional raw water tank (s) if the firefighting supply is on a dedicated ring main.

Refer to Appendix B for the full water supply-demand balance calculations.

Table 1: Water Supply vs Demand Balance Summary

FACILITY	NO. OF PEOPLE	FLOW ALLOWANCE (L/PERSON/DAY)	DEMAND (m ³ /DAY)	RAINFALL COLLECTION WITH 100% ROOF CONNECTION (m ³ /DAY)	RAINFALL COLLECTION WITH 30% ROOF CONNECTION (m ³ /DAY)
Business Park A	612	40			
Business Park B	1,707	40	54		
Business Park C	7,31	40	117	2,938	882
Business Park D	540	40	29		
Business Park E	1,410	40			
Ancillary Activities	–	–	30	–	–
Total	5,000	–	230	8389	2517

Notes:

1. Roof areas based on the assumption that 50% of the land area is attributed to industrial buildings (10,000 m² per building equivalent).
2. Rainwater collection calculated using 1 m annual rainfall and 17.5% loss factor (BRANZ and Water NZ guidance). The “Rainwater Collection (30% connected)” column equals 30% of the per-park full-roof yield.
3. Demand based on 40 L/person/day (TP58 commercial/industrial water use allowance).
4. Ancillary activities allocated 30 m³/day.
5. The number of people used in these calculations has been applied as a conservative worst-case scenario. Any increase in occupancy beyond this level would require further assessment to confirm that the water supply remains adequate. The figures are indicative and will be confirmed at a later stage for the substantive application once final gross floor areas are established.

7 WATER TREATMENT OPTIONS

A centralised Water Treatment Plant (WTP) will be located within the Project Area. The system can be scaled or staged to match development growth. A high-level treatment process suitable for roof water source will be included in the design for the proposed WTP. This will include:

1. Pre-Screening (leaf screen/mesh filtration).
2. Cartridge filtration (5–20 micron).
3. UV disinfection.
4. Chlorination for secondary disinfection.
5. Treated water storage tanks.
6. Booster pumps and private distribution network.

7.1 Indicative Storage

Raw water storage has been based on a 30-day security period to accommodate rainfall variability and ensure continuous supply to the WTP. The required capacity for this allowance is approximately 5,600 m³. In practice, this storage will be distributed across the development, with each building provided with its own dedicated raw water tank sized in proportion to its roof catchment and demand profile. This decentralised arrangement allows storage to be integrated within individual building platforms, supports staged construction, and reduces the need for a single large reservoir. Collectively, the individual tanks will provide the total raw water storage capacity required for the Project.

Treated water storage has been based on a 3-day operational reserve to provide resilience during WTP downtime, maintenance events, or short-term fluctuations in system demand. The indicative treated water storage requirement is approximately 560 m³. Compartmentalised tanks are recommended to maintain supply continuity during cleaning and inspection.

8 WATER SERVICES ACT / TAUMATA AROWAI STANDARDS

As the population supplied across the Project Area exceeds 500, the Project needs to meet the relevant standards set by the Water Services Act 2021 and Taumata Arowai – being the Drinking Water Quality Assurance Rules 2022 (DWQAR) under the Networked Supply – Large Supply classification.

This enables a centralised water treatment system to supply multiple buildings through a reticulated distribution network. To comply with this pathway, the supply must meet the requirements of the General, Source S3, Treatment T3, and Distribution D3 rule modules of the DWQAR.

Preparation of a Water Safety Plan (WSP) and Source Water Risk Management Plan (SWRMP) will be required. Compliance with the Distribution D3 rule module requires the use of residual disinfection within the reticulation network. Chlorination of treated water will therefore be necessary to maintain a measurable free available chlorine (FAC) residual throughout the system as listed in the treatment processes under Section 7. These Management Plans are required to be certified by Taumata Arowai. This process falls outside of the Fast Track Approvals Act.

9 OWNERSHIP AND MANAGEMENT

For the successful management of water supply for the development, a strong management framework must be implemented and operated during the life of the resource consent and detailed through the future conditions of consent. Ownership and management options include:

- Private utility management.
- Body corporate structure.

The above options will be investigated at the substantive application stage.

10 STAGING AND SCALABILITY

The centralised WTP, storage and distribution can be designed modularly:

- Staged to supply early buildings with base plant sized for initial flow and with reserved footprint for future modules.
- Additional treatment and storage modules added as more buildings come online.
- Telemetry and control systems sized for full build-out but commissioned in stages.

Staged construction reduces up-front capital while maintaining compliance and reliability.

11 CONSENTING PATHWAYS

Key regulatory actions likely required:

- Registration and compliance pathway with Taumata Arowai (Water Services Act 2021 and Drinking Water Quality Assurance Rules 2022).
- Resource and/or Building consents for tanks, treatment plant buildings and pump stations.
- Health and safety and operator licensing arrangements for ongoing operation, to be undertaken by the operator in accordance with Taumata Arowai requirements and relevant health and safety regulations.

12 CONCLUSIONS

The assessment confirms that a centralised potable water supply system from roof water harvesting is feasible for the Project. The estimated daily demand of approximately 230 m³/day can be met through a centralised treatment system and appropriately sized raw and treated water storage. The supply will be classified as a Large Drinking Water Supply, requiring registration and ongoing compliance with the Water Services Act 2021 and Drinking Water Quality Assurance Rules 2022.

It is noted that the Drinking Water Quality Assurance Rules 2022 are currently being amended by the Water Services Authority Taumata Arowai. The revised version is anticipated to be published in April 2026 and effective from 1 July 2027.

Further investigations, including roof-water yield analysis, and detailed treatment plant design, will be provided during the substantive application stage. Nevertheless, the proposed servicing solution aligns well with the development and provides a robust and resilient water supply, and addresses the known and anticipated adverse effects associated with water supply for this development.

13 NOMINATED KEY PERSONNEL

GWE's nominated key personnel are:

MARIA JOHNSON – WATER SECTOR LEAD



Maria is a Technical Project Manager with over 14 years' of experience in the Water Industry and a previous 2 years' experience in Research and Development.

Maria has worked on a variety of projects for Watercare Services Limited for both the Operations and Infrastructure departments. As a Water Quality Analyst, she has worked on a number of water quality and compliance related projects, including automation of all of Watercare water quality compliance data and reports. She was also in charge of the company grading process before and after the integration with the local networks. As a Water Treatment Planner and Project Manager, she carried out planning investigations for the upgrade and development of water treatment facilities to meet current and foreseeable future business needs and progress planned capital works through their project definition and development phases to the point of business case justification.

At Harrison Grierson, she has worked on a number of water and wastewater treatment infrastructure upgrades. She project managed successfully a large number of projects and led the Water Team.

Maria joined GWE as a Water Sector Lead to build GWE portfolio, provide technical inputs on projects and ensure good practice project management is followed.

Maria has excellent communication and project management skills, achieving structure and success for both the client and the company. Thanks to her R&D background, she has excellent attention to details to achieve success.

MARIA JOHNSON – WATER SECTOR LEAD

AREAS OF EXPERTISE

- Project coordination and management.
- Stakeholder relationship.
- Process design of water treatment plants and water supply infrastructure.
- Water Services Act 2021 and associated 2022 Drinking Water Standards and Rules.

PAUL HAN – INTERMEDIATE WATER/WASTEWATER ENGINEER



Paul is an Intermediate Water and Wastewater Engineer with a first-class Bachelor of Civil and Environmental Engineering (Hons) degree from the University of Auckland. Paul has over 4 years of New Zealand experience working on a diverse range of water and wastewater treatment projects.

- On-site wastewater management and design.
- Mass balance and measuring plant performance for wastewater treatment plants.
- Proficient user of AutoCAD for designing site plans.
- Discharge consent applications for commercial and domestic wastewater.
- Water supply treatment design and engineering.

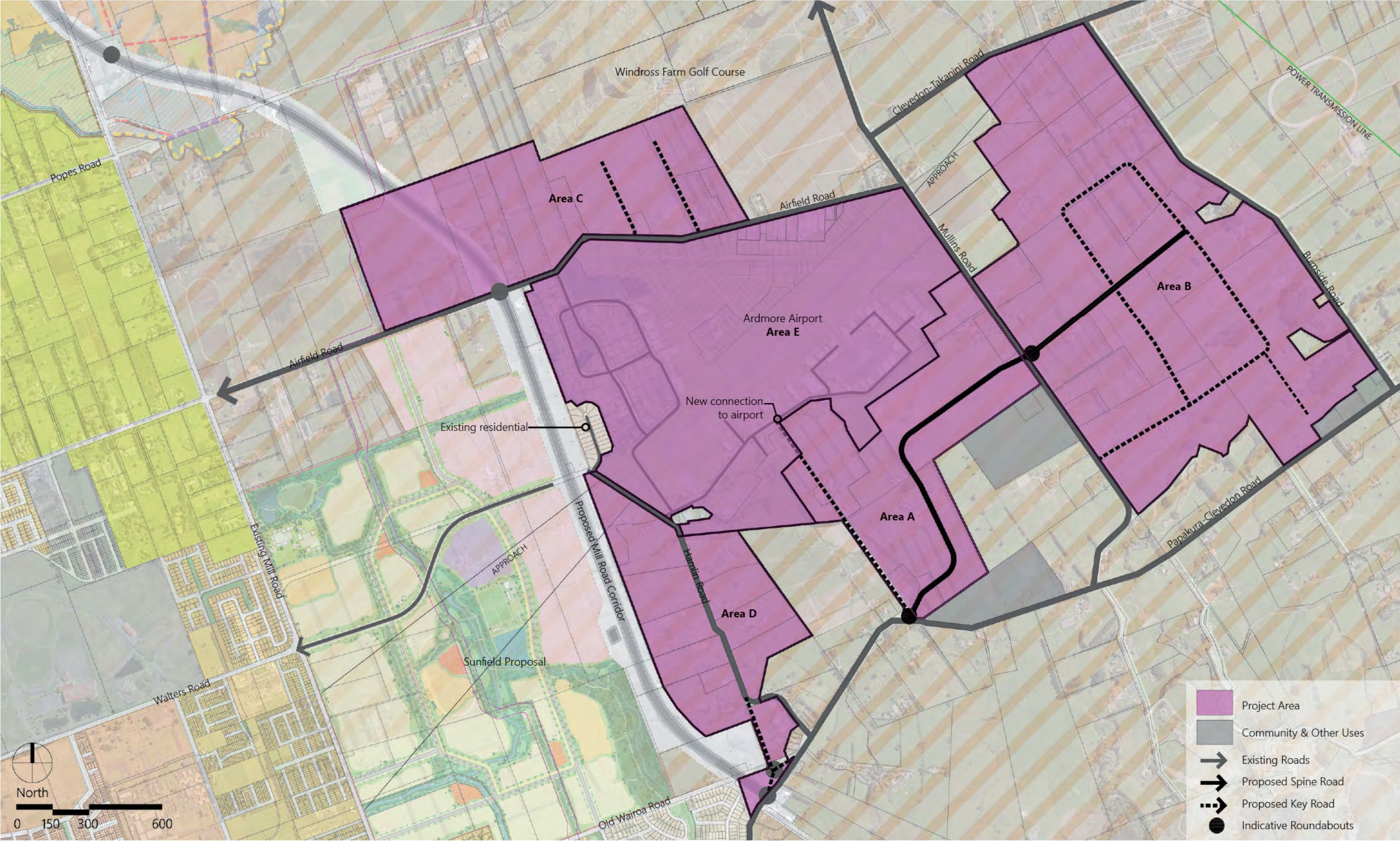
14 LIMITATIONS

This report has been prepared for the sole benefit of Knight Investments Limited as our Client, their appointed representatives, and those reviewing/evaluating the application for Referral under the FTAA according to their instructions, for the specific objectives described herein. This report is qualified in its entirety and should be considered in the light of our Terms of Engagement with the Client and the following:

- a. Data or opinions contained within the report may not be used in other contexts or for any other purpose without our prior review and written agreement. Any reliance will be at the parties' sole risk.
- b. No responsibility is assumed for inaccuracies in reporting by the information providers. In no event, regardless of whether GWE 's consent has been provided, does GWE accept any liability, whether directly or indirectly, for any liability or loss suffered or incurred by any third party to whom this report is disclosed placing any reliance on this report, in part or in full.
- c. GWE has relied on information provided by the Client and by third parties to produce this document and arrive at its conclusions

**APPENDIX A
SCHEME PLAN**

Project Area



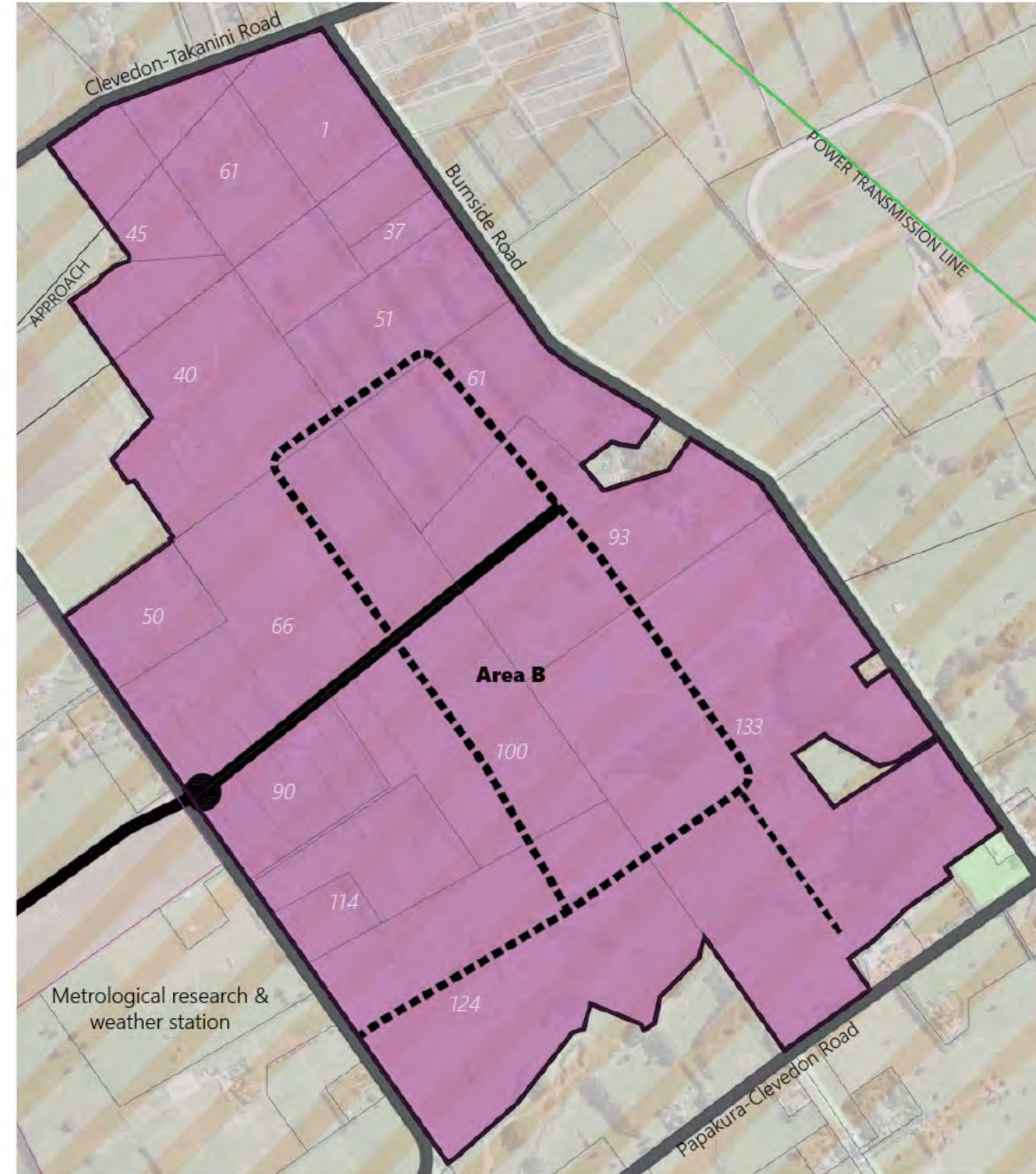
Project Areas

Area A



Site	Address	Legal Description	Area (m ²)
1	47 Mullins Road	Lot 2 DP 206430	36,987
2	53 Mullins Road	Lot 3 DP 206430	218,058
3	61 Mullins Road	Lot 1 DP 75641	16,187
4	803 Papakura-Clevedon Road	Lot 1 DP 450259	15,060
5	7 Bullens Road	Lot 1 DP 141367	12,819
6	19 Bullens Road	Lot 2 DP 450259	170,300
7	49 Bullens Road	Lot 2 DP 111591	40,620
8	51 Bullens Road	Lot 2 DP 473510	112,028
9	52 Bullens Road	Lot 1 DP 473510	4,184
Total			626,243

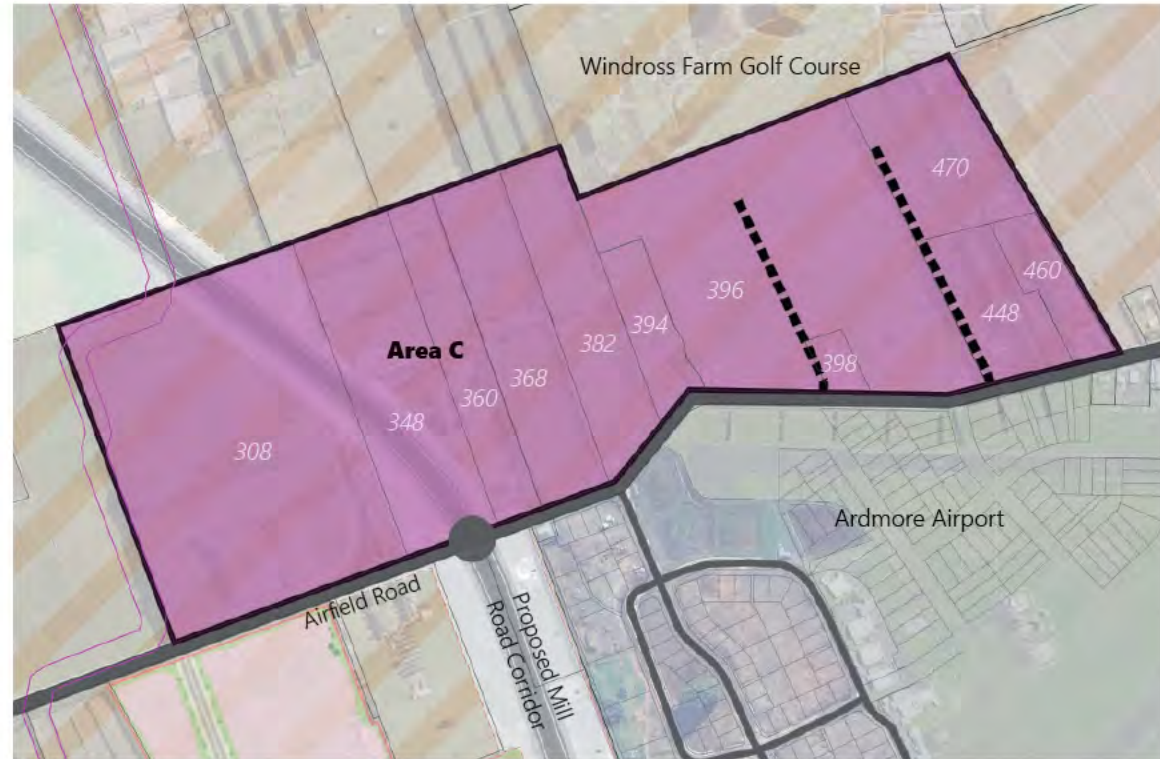
Area B



Site	Address	Legal Description	Area (m ²)
1	45 Clevedon-Takanini Road	Lot 3 DP 169281	42,200
2	61 Clevedon-Takanini Road	Lot 1 DP 112997	90,708
3	40 Mullins Road	Lot 2 DP 169281	136,208
4	50 Mullins Road	PT ALLOT 50 Parish OF PAPAKURA	40,468
5	66 Mullins Road	Lot 1 DP 22687	192,225
6	90 Mullins Road	LOT 2 DP 598608	57,569
7	100 Mullins Road	LOT 1 DP 598608	123,694
8	114 Mullins Road	Lot 1 DP 95196, Lot 1 DP 81758	50,002
9	124 Mullins Road	Lot 2 DP 129748	224,901
10	1 Burnside Road	Lot 1 DP 165259	69,782
11	37 Burnside Road	Lot 2 DP 165259	11,188
12	51 Burnside Road	Lot 2 DP 112997	67,394
13	61 Burnside Road	Lot 2 DP 311910	98,550
14	93 Burnside Road	PT ALLOT 1 DP 94470	148,013
15	133 Burnside Road	LOT 2 DP 533681	393,676
Total			1,746,578

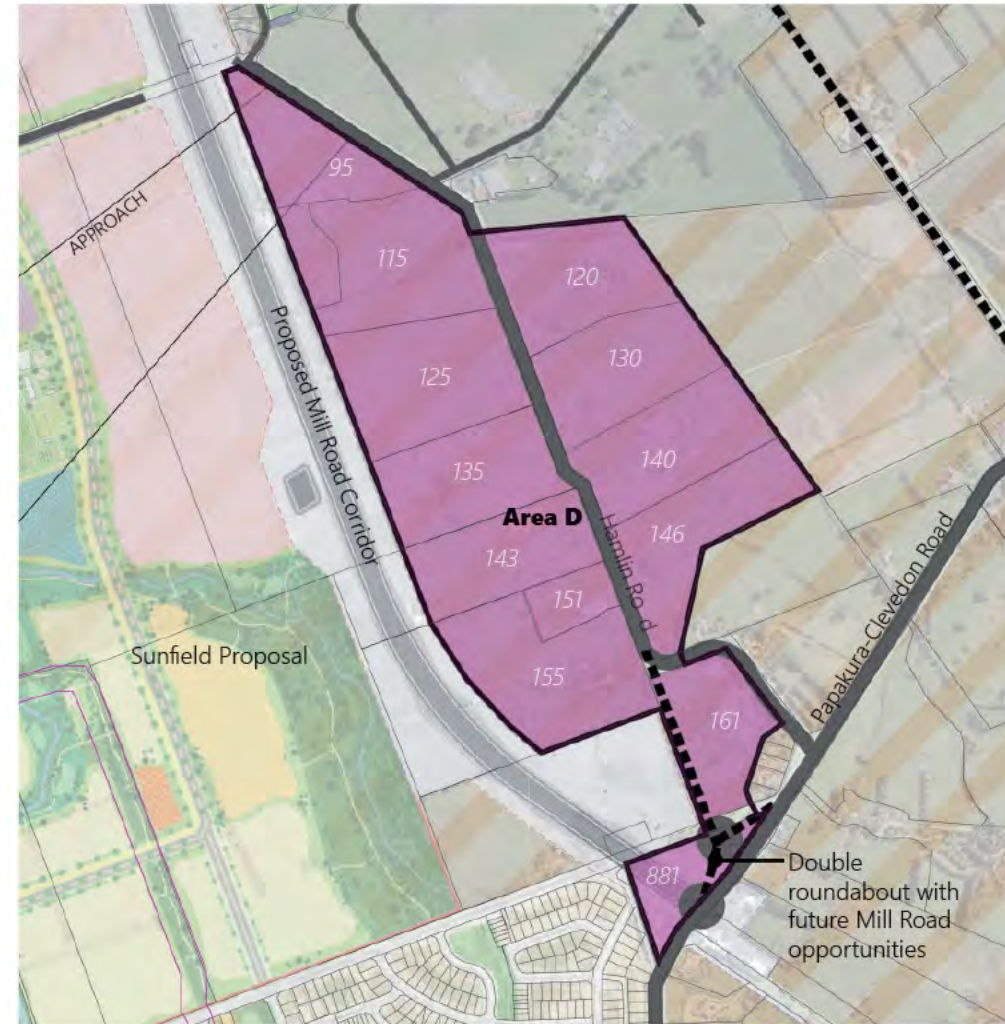
Project Areas

Area C



Site	Address	Legal Description	Area (m ²)
1	308 Airfield Road	Lot 5 BLK XV DP 20982	210,209
2	348 Airfield Road	Lot 1 BLK XV DP 192819	81,740
3	360 Airfield Road	Lot 2 DP 192819	40,105
4	368 Airfield Road	Lot 2 DP 96780	60,020
5	382 Airfield Road	Lot 1 DP 96780	52,708
6	394 Airfield Road	Lot 1 DP 198874	20,000
7	396 Airfield Road	Lot 2 DP 208957	175,205
8	398 Airfield Road	Lot 1 DP 208957	6,017
9	448 Airfield Road	Lot 1 DP 336380	32,303
10	460 Airfield Road	Lot 2 DP 336380	17,707
11	470 Airfield Road	Lot 1 DP 92845	51,799
Total			747,813

Area D



Site	Address	Legal Description	Area (m ²)
1	95 Hamlin Road	Pt Lot 1 DP 50029	30,654
2	115 Hamlin Road	Pt Lot 1 DP 50029 Pt Lot 2 DP 50029	57,230
3	120 Hamlin Road	Lot 1 BLK XV DP 53384	40,589
4	125 Hamlin Road	Lot 1 BLK XV DP 53136	51,817
5	130 Hamlin Road	Lot 2 DP 53384	40,868
6	135 Hamlin Road	Lot 2 BLK XV DP 53136	40,519
7	140 Hamlin Road	Lot 3 DP 53384	41,564
8	143 Hamlin Road	Lot 1 DP 11032	51,395
9	146 Hamlin Road	Pt Lot 4 DP 53384	43,215
10	151 Hamlin Road	Lot 1 DP 316491	11,310
11	155 Hamlin Road	Lot 2 DP 316491	91,113
12	161 Hamlin Road	Lot 6 DP 39433	32,653
13	881 Papakura-Clevedon Road	Lot 1 DP 483053	19,174
Total			552,101

Project Areas

Area E - Ardmore Airport

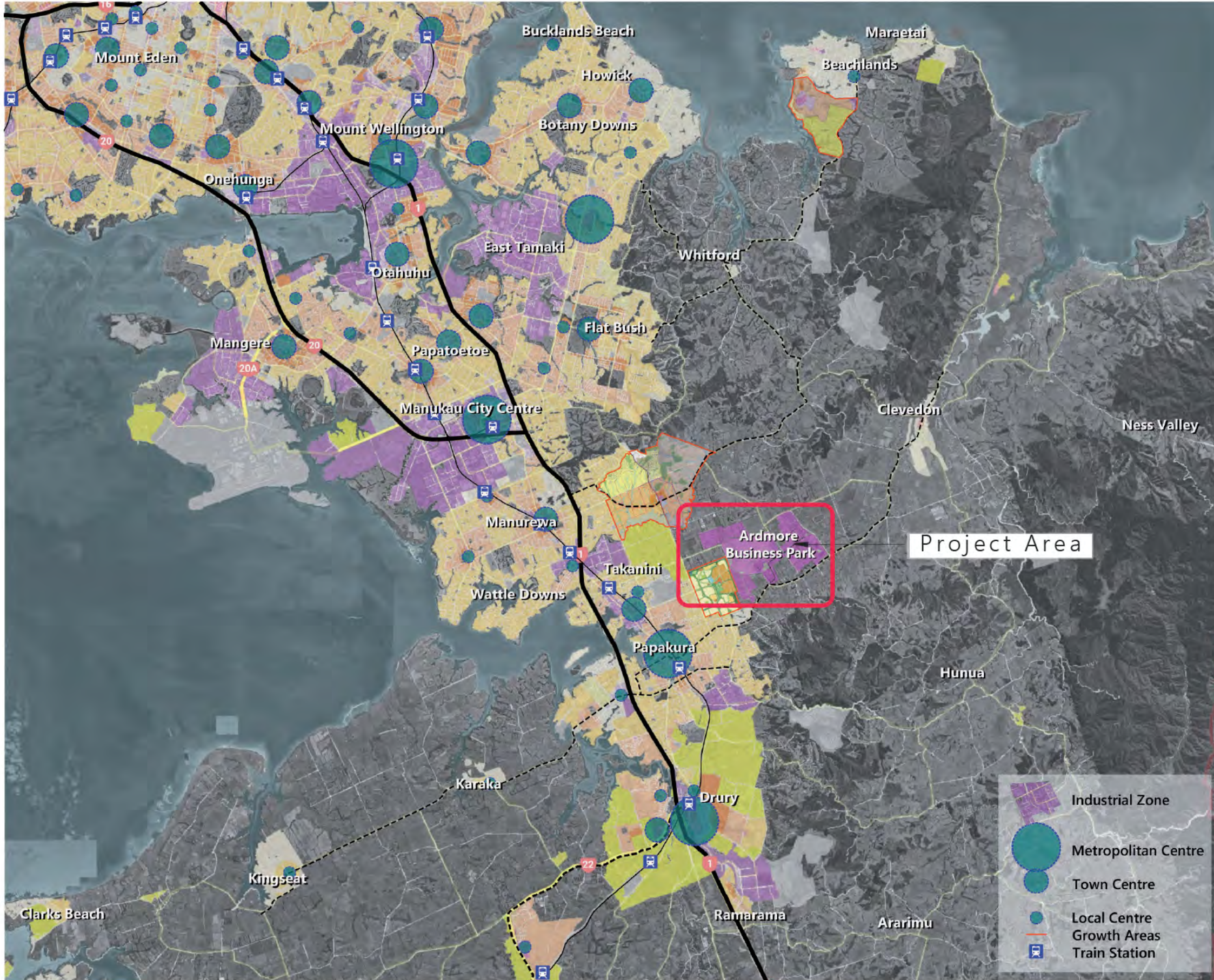


Site	Address	Legal Description	Area (m ²)
1	371 Airfield Road	LOT 1 DP 578804	1,181,118
2	453 Airfield Road	Lot 200 DP 319290	2,078
3	457 Airfield Road	Lot 202 DP 458277	3,685
4	463 Airfield Road	Lot 203 DP 458277	1,301
5	469 Airfield Road	Lot 204 DP 458277	4,004
6	473 Airfield Road	Lot 205 DP 458277	3,533
7	479 Airfield Road	Lot 206 DP 458277	5,161
8	487 Airfield Road	Lot 207 DP 458277	14,751
9	495 Airfield Road	Lot 208 DP 458277	4,359
10	499 Airfield Road	Lot 209 DP 458277	1,500
11	99 Corsair Lane	LOT 2 DP 578804	222,692
Total			1,444,182



Employment into the Future

The Big Picture



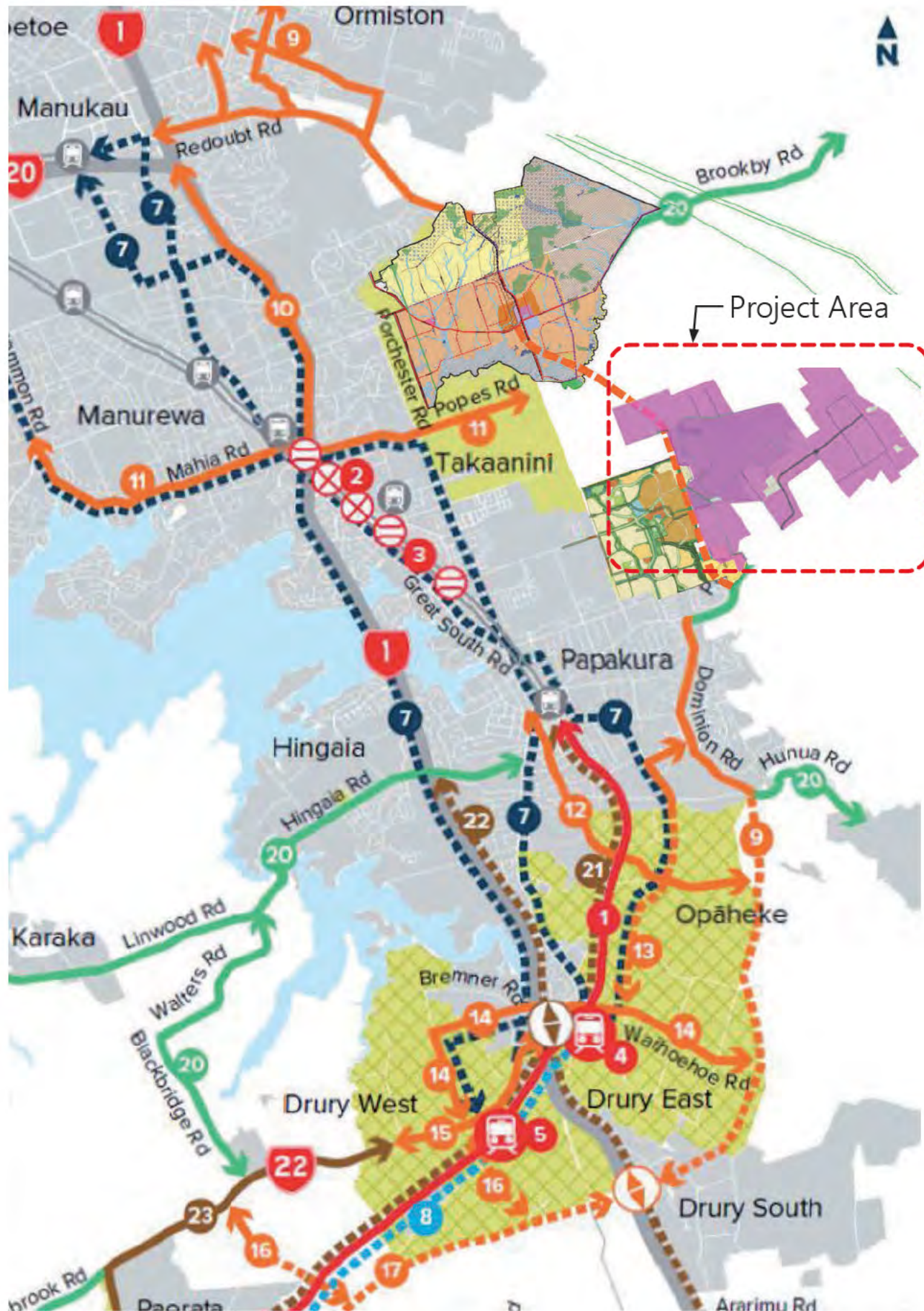
Region

- Recent rezoning in South Auckland has been residentially and retail focussed.
- Population growth forecast to increase 50% in the next 30 years in South Auckland.
- There is a significant shortage of industrial land across Auckland, particularly in South Auckland.
- The shortage will worsen without more industrial areas being developed.
- The focus on employment should be providing opportunities for jobs close to where people are choosing to live.

Site

- Ardmore Airport is one of the country's busiest general aviation airfields.
- The location enhances supply chain efficiency, complementing other industrial areas such as Drury, Auckland Airport, Wiri and East Tamaki.
- Close to existing and future labour markets.
- Capitalises on proximity to State Highway 1, Mill Road, the North Island main rail network, natural gas infrastructure, and electrical substations.

Roading & Access



Current Opportunities

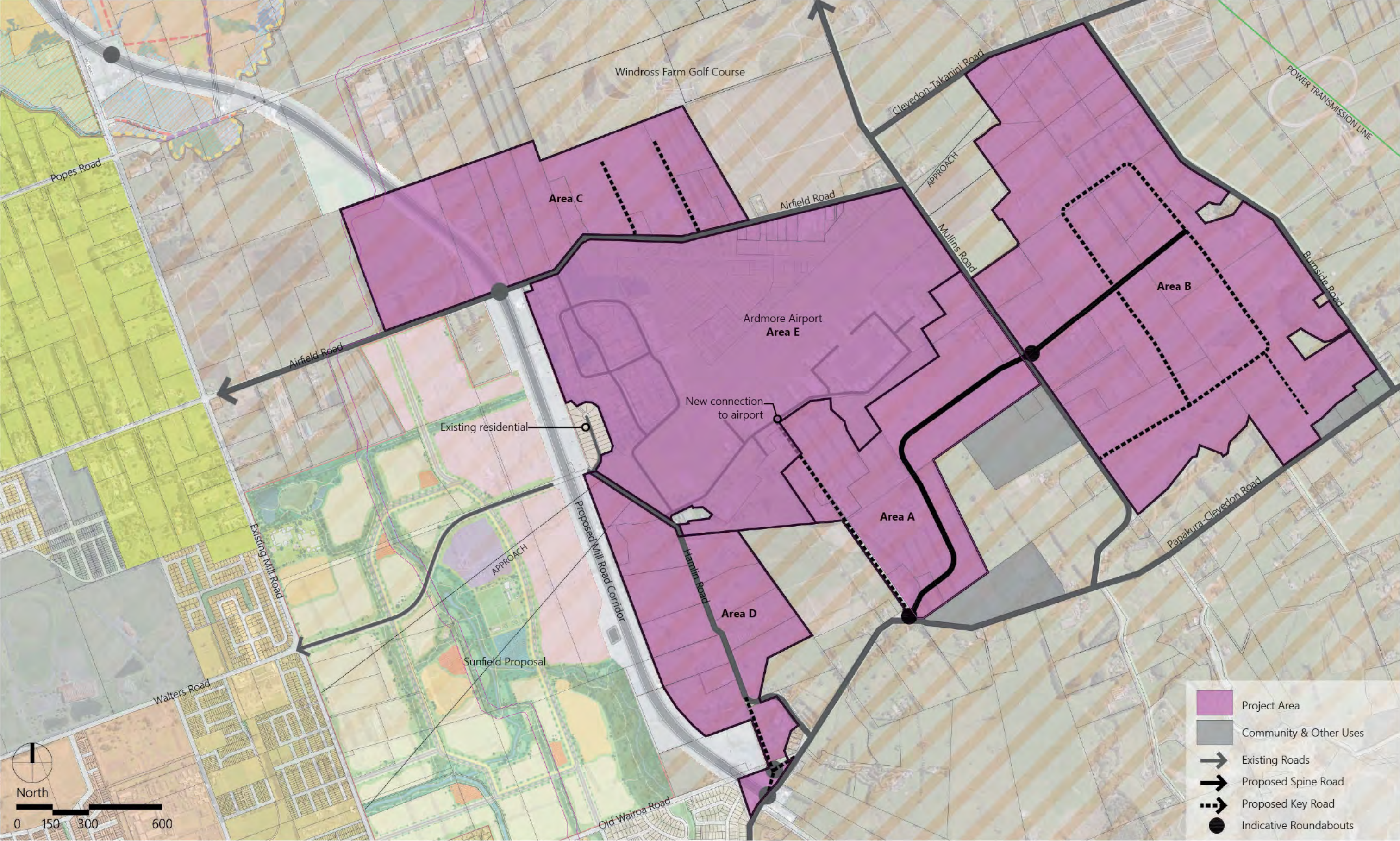
- Adjacent to over-dimension truck routes (including Mill Road and Papakura-Clevedon Road)
- Well served by the arterial road network, including Airfield Road, Papakura-Clevedon Road and Mill Road
- Supports Auckland Transport investment in infrastructure with the grade separation of Takanini Level Crossings (Committed Project) providing improved access to Great South Road and State Highway 1
- Increases employment opportunities to growing South Auckland residential catchments (Takanini, Papakura) reducing distance travelled to wider employment hubs

Future Opportunities

- Is located immediately adjacent to and supports NZTA/ Government investments in infrastructure (Mill Road – being a Road of National Significance)



Project Area



Concept Plan



Precedent

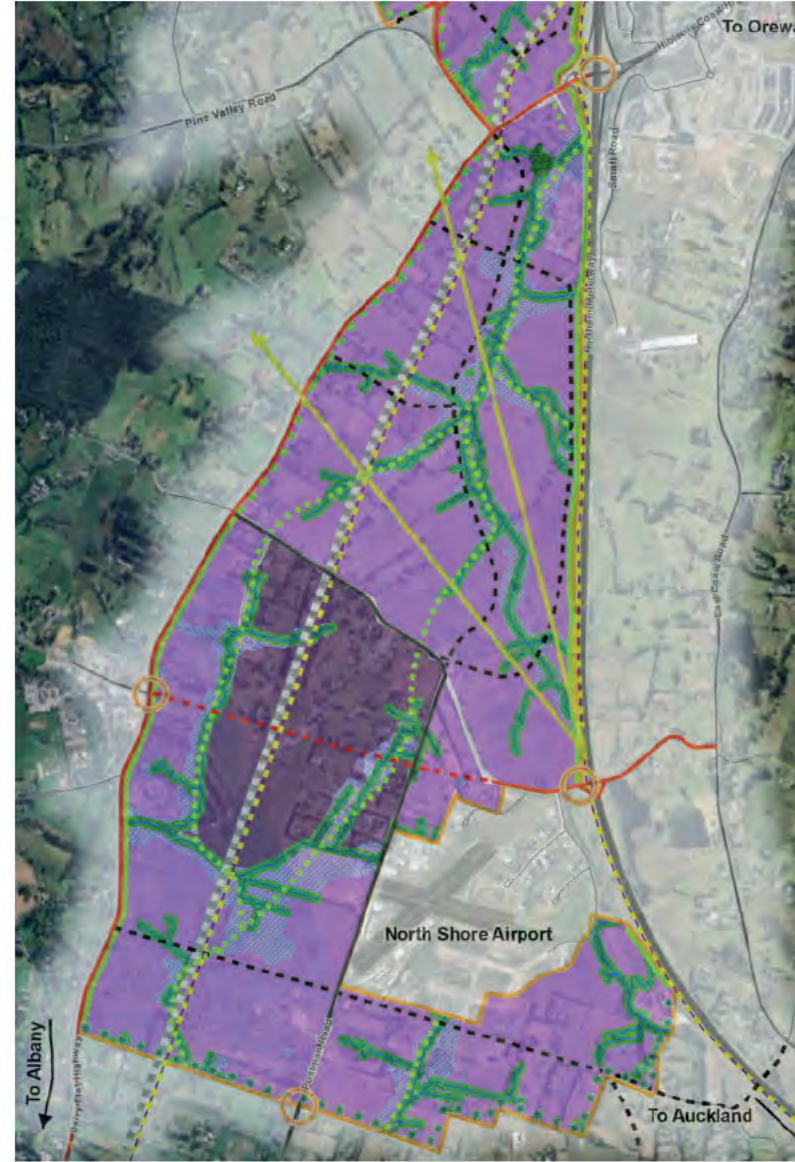
Worldwide trend

There is a notable trend of industrial activity developing around airports globally, driven by proximity to transportation networks, air freight logistics, compatible activities and economic benefits



Hamilton Airport

- Industrial development establishing around Hamilton airport



North Shore Airport

- Recent structure plan locates industrial around the airport
- A current plan change is seeking to live zone the northern portion



Archerfield Airport

- An example of an airport in Brisbane with industrial, retail and residential around



Queenstown Airport

- Excellent mix of residential, commercial and industrial land use surrounding the airport

APPENDIX B
WATER SUPPLY-DEMAND BALANCE CALCULATION

V1 GWE November 2025
PROJECT TITLE: Ardmore Business Park
OBJECTIVE: Determine the supply/demand

PROJECT ASSUMPTIONS AND INPUT DATA (Rainwater):

17.5% Rainwater Treatment Losses / collection inefficiencies (Evaporation, first flush diverter, Spillage) ***
 1 metres Rainfall (incl distribution vs storage)
 1,300,000 Business Park Land Area (m2)

input data
 Demand
 Rainwater

* Source TP58 On-Site Wastewater Systems 2004 paper Fig 6.1
 ** Water NZ Waterloss guidelines
 *** BRANZ fact sheet
 **** used 50 m2 per person for dry retail, 15 L per m2 of net floor area

Note	<p>likely gross floor area for future activities / buildings between 67 hectares and 130 hectares (130 hectares used)</p> <p>For the purposes of this assessment, all warehouses have been assumed to have a floor area of 10,000m² each.</p> <p>Total workforce of 5,000 persons provided by the client was adopted for design.</p> <p>A flow allowance of 40 L/person/day was applied, assuming full water-saving devices.</p> <p>The 5,000 persons were distributed proportionally based on the relative occupancy of each business park from the development framework.</p>
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Table 1: Rainwater Harvesting/Groundwater Bore supply and Development Capacity Check

FACILITIES	NO. OF PEOPLE	NO. BUILDINGS	ROOF AREA (M2)	FLOW ALLOWANCE (L/PERSON/DAY)	Water Requirement m3/day	RAINFALL COLLECTION (100% ROOF CONNECTION) (m ³ /d) LZ Sc.1	RAINFALL COLLECTION (30% ROOF CONNECTION) (m ³ /d) LZ Sc.1	POTABLE DEMAND (m ³ /d) (Rainwater) LZ Sc.1	WATER RESERVOIR STORAGE (2 DAYS)	WATER RESERVOIR STORAGE (4 DAYS)	WATER RESERVOIR STORAGE (7 DAYS)	Additional Ground Water required for non-portable? LZ Sc.1
BUSINESS PARK A		130				82.5%		100%				
Warehouse/businesses	612		10000	40	24.48	2938.36						
BUSINESS PARK B							881.51		-5740.2	-11480.3	-20090.5	No
Warehouse/businesses	1707		10000	40	68.28			68.28				
BUSINESS PARK C									58.5	117.0	204.7	Yes
Warehouse/businesses	731		10000	40	29.24			29.24				
BUSINESS PARK D									43.2	86.4	151.2	Yes
Warehouse/businesses	540		10000	40	21.6			21.60				
BUSINESS PARK E												
Warehouse/businesses	1410		10000	40	56.4							
Ancillary Activities												
Ancillary Activities					30			30.00				
TOTAL	5000	130			230	2938.36	881.51	149.12	-5638.5	-11276.9	-19734.7	

Table 2: Supply-Demand Summary (with 100% roof connection)

Total Demand (m3/day)	149.12
Rainwater available (m3/day)	2938.36
Total Available (m3/day)	2938.36
Shortfall/Surplus (m3/day)	2789.24

Table 2: Supply-Demand Summary (with 30% roof connection)

Total Demand (m3/day)	149.12
Rainwater available (m3/day)	881.51
Total Available (m3/day)	881.51
Shortfall/Surplus (m3/day)	732.39