

## **APPENDIX E: WATER GUIDELINES**

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## SECTION 1 – INTEGRATED WATER CYCLE PLAN

The *Integrated Water Cycle Plan* (IWCP) must be prepared by a qualified practicing Civil Engineer with demonstrated relevant experience in stormwater and environmental engineering and address the following matters:

### 1.1 EXISTING ENVIRONMENT

A summary of the current condition of the land and its catchment context, with particular reference to the following issues:

- catchment hydrology and hydrogeology;
- soil conditions;
- vegetation cover, remnant native vegetation and vegetation condition;
- groundwater depth and chemistry;
- site constraints and hazards such as flooding, slope stability, reactive soils, coastal hazards, erosion hazard, urban salinity, acid sulfate soils and land contamination;
- water quality conditions; and
- stream flow regime.

### 1.2 OBJECTIVES AND PERFORMANCE STANDARDS

Water cycle outcomes are to be achieved during construction and throughout the life of the development. These should be consistent with those contained in plans, strategies or policies adopted by relevant agencies, including regional plans and strategies, water management plans, catchment blueprints, stormwater management plans and joint statements of intent.

The following matters should be addressed:

- water consumption;
- flood risk;
- stream erosion;
- water balance (relative balance between runoff, infiltration and evapotranspiration);
- salinity;
- stream flow and environmental flows;
- water quality;
- water-dependent ecosystems such as streams, riparian zones, wetlands and estuaries;
- erosion and sedimentation;
- biodiversity and habitat conservation;
- groundwater conditions;
- public health;
- recreational use of waterways and related areas;

- aesthetic, visual and landscape issues; and
- indigenous and European cultural issues.

### **1.3 PLANNING AND DESIGN PRINCIPLES**

General principles to be adopted at the sub-catchment, precinct, street and lot levels that seek to promote achievement of the objectives and performance standards. These principles will shape the overall planning, design and staging of the project. They should be compatible with principles outlined in strategies and plans adopted by relevant agencies, including:

- regional strategies;
- settlement, economic, housing and infrastructure strategies;
- biodiversity, catchment, environmental and open space strategies; and
- structure plans and master plans.

### **1.4 WATER MANAGEMENT MEASURES**

Management measures that are to be applied so as to meet relevant objectives and performance standards.

### **1.5 COMMUNITY PARTNERSHIPS**

Community and educational initiatives that will support the objectives and performance standards.

### **1.6 INFRASTRUCTURE PROGRAM**

An infrastructure program that integrates all aspects of water cycle management, including water supply, sewerage, drainage, wastewater treatment and reuse, water quality control, flood risk management, open space provision and ecological protection.

### **1.7 ONGOING OPERATION**

Strategies to ensure effective ongoing maintenance of on-site water management measures, maintenance requirements and proposed enforcement mechanisms.

### **1.8 MONITORING PROGRAM**

Arrangements for monitoring the achievement of objectives and performance standards.

### **1.9 CONSULTATION**

You should consult with relevant agencies such as Council, Sydney Water and the NSW Office of Environment and Heritage.

## SECTION 2 – FLOOD RISK MANAGEMENT REPORT

The *Flood Risk Management Report* must be prepared by a qualified practicing Civil Engineer with demonstrated relevant experience in flooding and floodplain management and address at least the following details:

1. Description of the existing stormwater drainage system, including catchment definition.
2. Extent of the 1% AEP flood event in the vicinity of the development.
3. The Flood Hazard Category affecting the subject site and surrounds. Where to site is subject to High Hazard flooding category, the Probable Maximum Flood (PMF) extent must be shown.
4. Long and cross sections showing the Flood Planning Level(s) in relationship to the floor levels of all existing and proposed components of the development.
5. Recommendations on all precautions to minimise risk to personal safety of occupants and the risk of property damage for the total development to address the flood impacts on the site during a 1% AEP and Probable Maximum Flood (PMF) event. These precautions must include but not be limited to the following:
  - a. Types of materials to be used to ensure the structural integrity of the development for immersion and impact of velocity and debris for the 1% AEP flood event and PMF (for high hazard);
  - b. Waterproofing methods, including electrical equipment, wiring, fuel lines or any other service pipes or connections;
  - c. A flood evacuation strategy (Flood Emergency Response Plan); and
  - d. On site response plan to minimise flood damage, and provide adequate storage areas for hazardous materials and valuable goods above the flood level.
6. Details of any flood mitigation works that are proposed to protect the development.
7. Supporting calculations.
8. The architectural/engineering plans on which the assessment is based.
9. The date of inspection.
10. The professional qualifications and experience of the author(s).

Note 1: Where the proposal has the potential to increase flood levels, depths, velocities and/or the risk to life or property, through loss of flood storage and/or blockage/ redirection of overland flowpaths, the Report must include detailed flood analysis. Such analysis should address compliance with all relevant development controls and include survey cross-sections to provide representative topographic information. The proponent should approach Council to determine available Council flood studies for the area, with the analysis based on or calibrated against relevant studies. In some cases, flood model data can be obtained from Council, subject to application and payment of fees.

Note 2: The Report may be limited to a short report (**Flood Risk Management Statement**) for single residential dwellings, alterations and additions or change of use developments where the property is confirmed by the Flood Certificate as being subject only to low hazard flooding. The Flood Risk Management Statement must reference the relevant Flood Certificate; specify the relevant flood information applicable to the site, then describe the proposed development and how it meets the relevant development controls.

Note 3: If Council is concerned with the apparent loss of flood storage and/or flood or overland flow paths, and/or increase in flow velocities, and/or risk of life, on any type of development, the Applicant may be requested to undertake further analysis in support of the proposal and detail it in a new/revised Flood Risk Management Report.

## SECTION 3 – FORESHORE RISK MANAGEMENT REPORT

The *Foreshore Risk Management Report* must be prepared by a qualified practicing Civil Engineer with demonstrated relevant experience in coastal engineering and address at least the following details:

1. Description of the site and surrounding geotechnical and coastal/estuarine features;
2. Description of the existing and proposed development;
3. Identification of the geotechnical constraints on the land including assessment of the sub surface conditions, geo mechanics, slope stability and ground water conditions;
4. Identification of the constraints due to coastal/estuarine processes on the land including an assessment of storm wave impact, coastal processes, erosion and tidal inundation likely to occur during a 100 year ARI storm event;
5. Establishment of the 100 year ARI flood level associated with storm wave action and tidal inundation, including provision of adequate freeboard;
6. Assessment of the stability of the existing seawall adjacent to the boundary of the site with the harbour. The report must include recommendations to ensure continued stability of the wall during the construction process and in the long term;
7. Recommendations for the design of the stormwater drainage system for the site, including subsurface conditions, collection of runoff and its disposal to the harbour;
8. Certification that there is a low risk of instability of the site over the economic life of the development, including the proposed development and existing structures that are to be retained;
9. Where any floor levels of the proposed development and/or existing structures are proposed to be retained below the 100 year ARI flood level, the report must address whether and how the proposal is to be either flood proofed to protect the overall development or justify that periodic water inundation will not cause any adverse risk to the development, its occupants or uses. Note- that inundation of habitable components of the development is not permissible and must be provided with adequate freeboard;
10. Where any part of the proposed and/or existing development is below the flood level, the Report must make recommendations on all precautions to minimise risk to occupants and the risk of property damage. These precautions shall include but not be limited to safe evacuation, ensuring all structures, electrical equipment, wiring, fuel lines or any other service pipes and connections shall be waterproofed below the flood level, and be capable of withstanding the effects of wave action and tidal inundation;
11. Certification that the proposed development will not cause adverse impacts on surrounding lands, coastal environment and public amenities;
12. The architectural/engineering plans on which the assessment is based;
13. The date of inspection; and
14. The professional qualifications and experience of the authors.

SECTION 4 – FLOOD CONTROL LOT MAPS

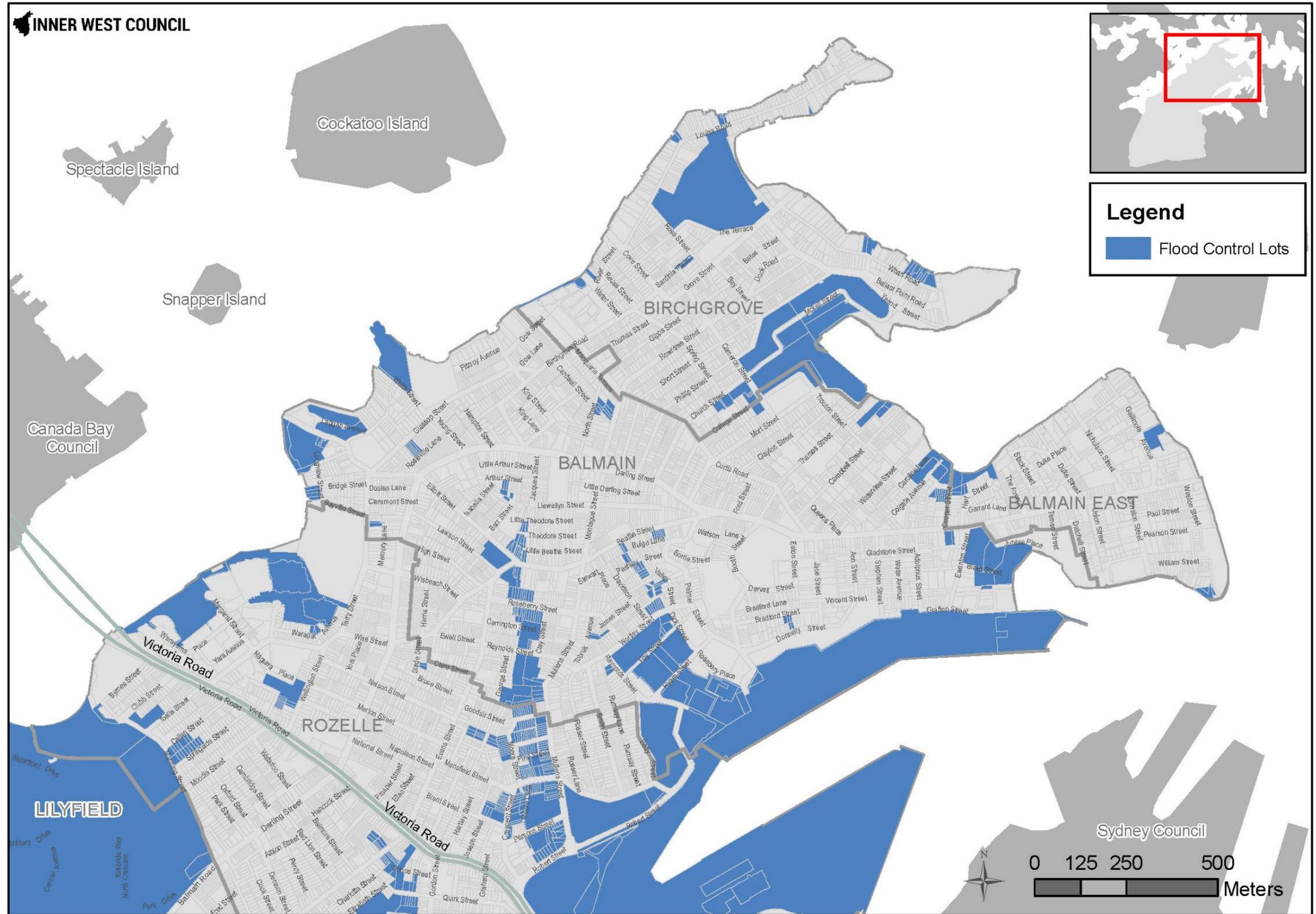


Figure 1: Flood Control Lot Map 1

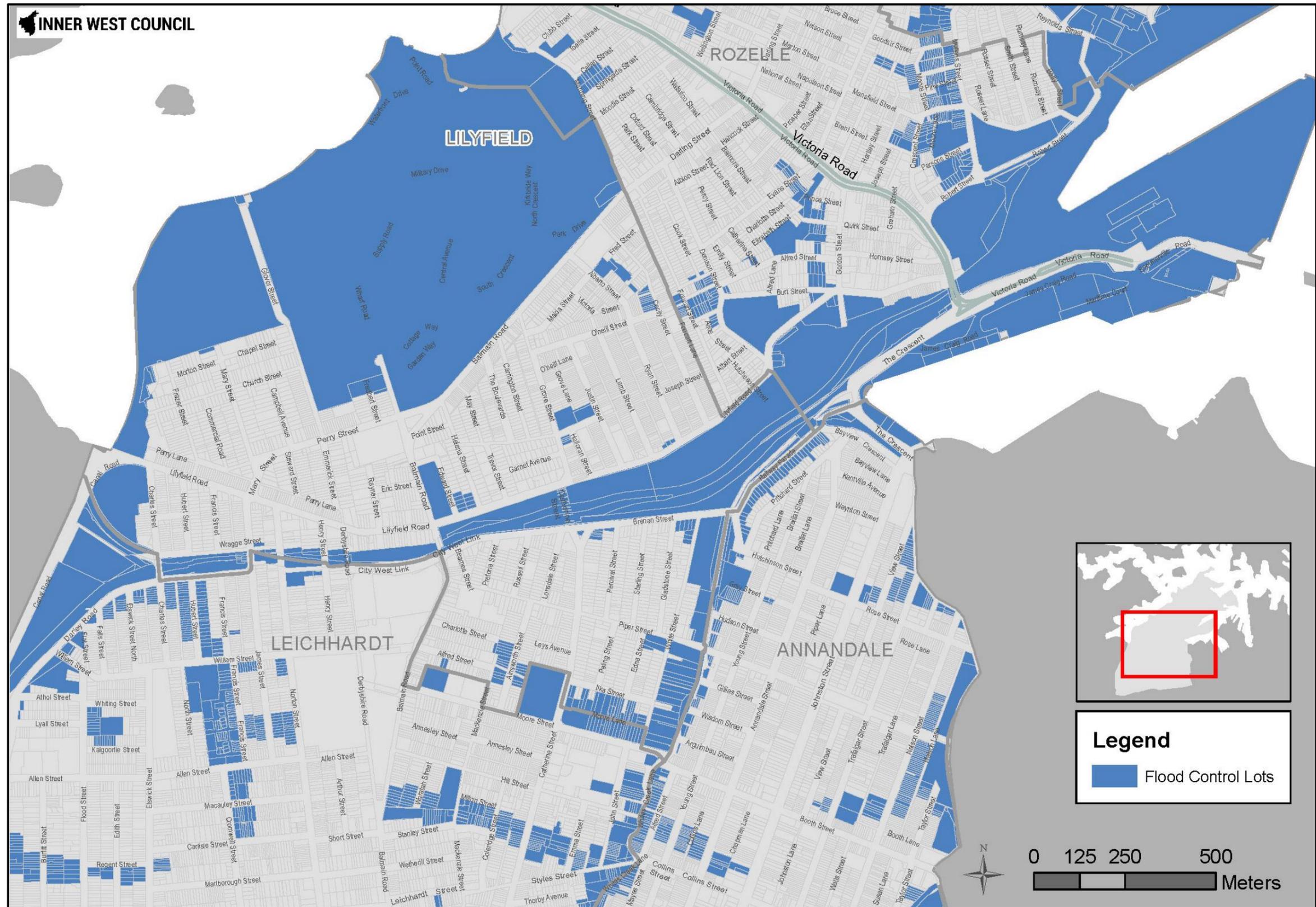


Figure 2: Flood Control Lot Map 2

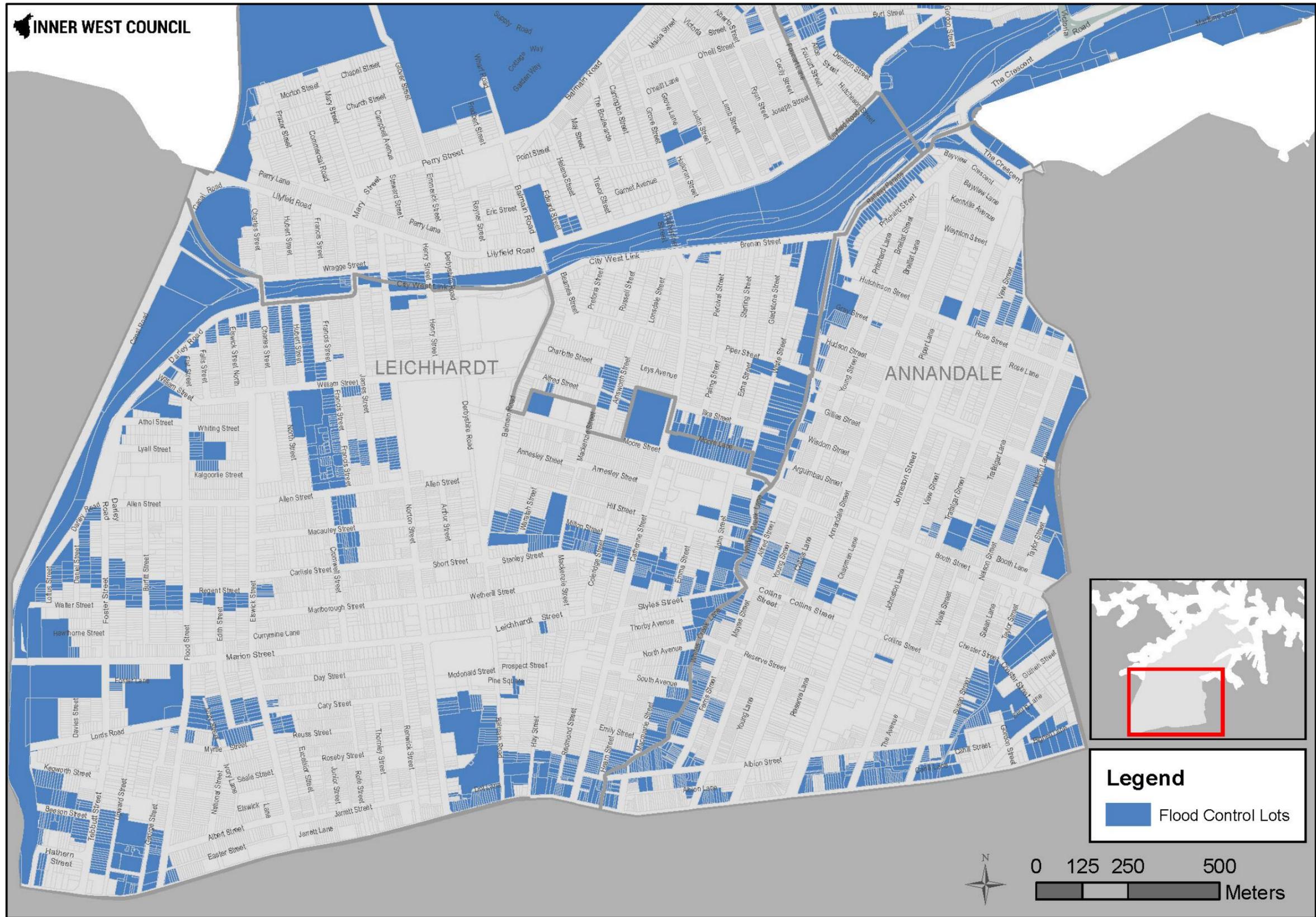


Figure 3: Flood Control Lot Map 3



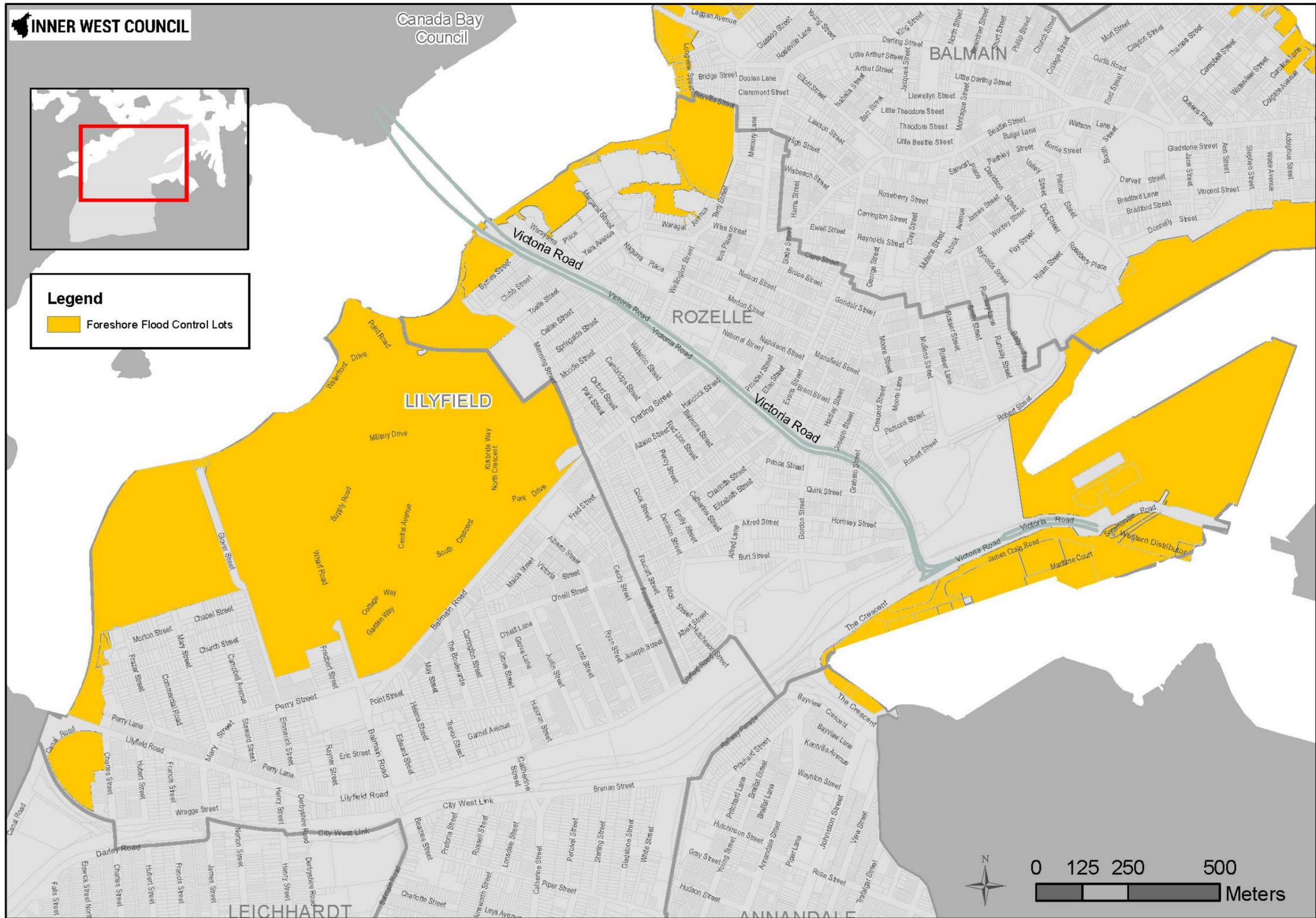


Figure 5: Foreshore Flood Control Lot Map 2