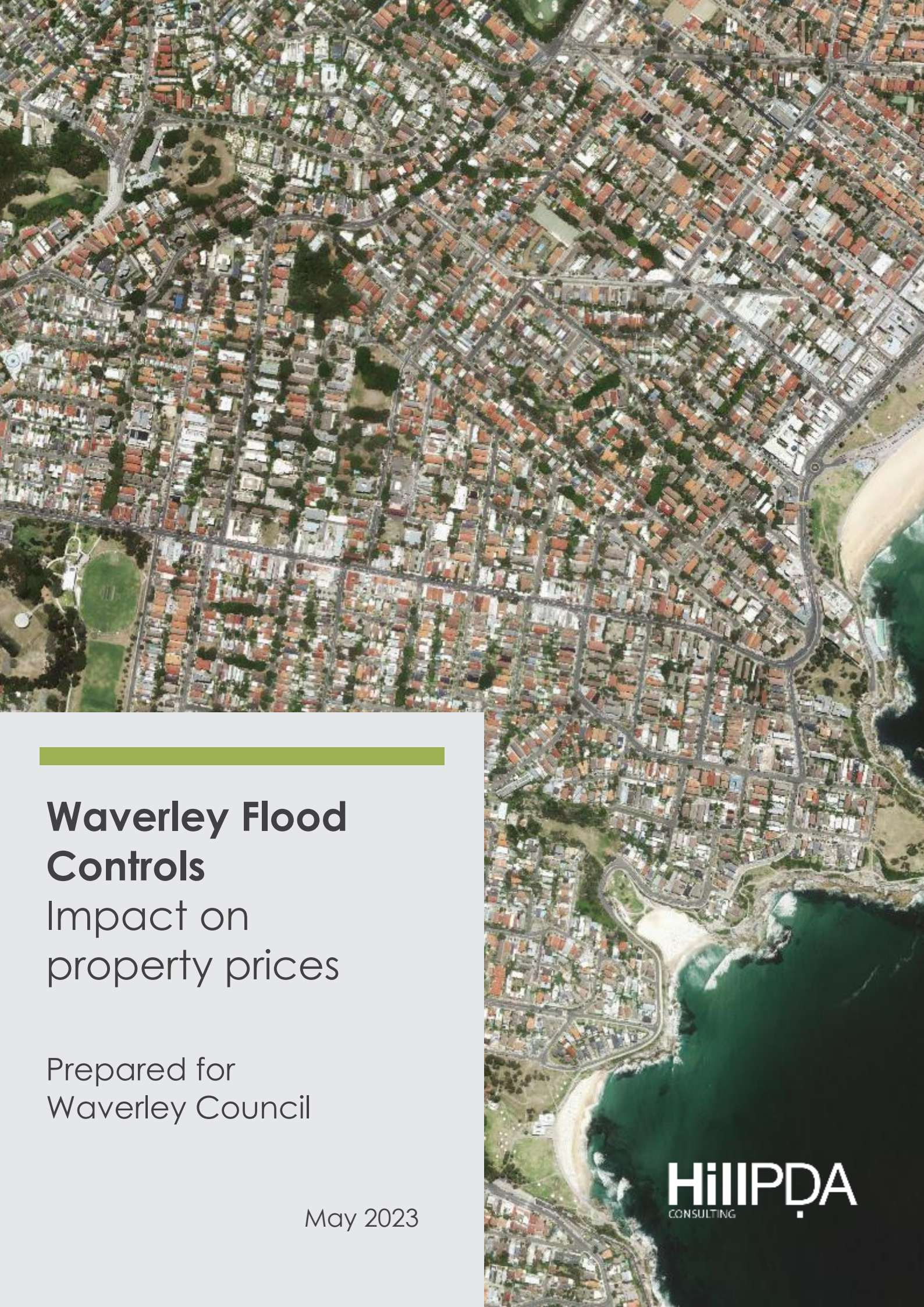

Waverley Flood Controls

Impact on property prices

Prepared for
Waverley Council

May 2023

HillPDA
CONSULTING

CONTENTS

Executive summary 4

1.0 Introduction 5

1.1 Background 5
1.2 Definition of Flooding 5
1.3 Proposed DCP Controls 5
1.4 Purpose of the study 5

2.0 Literature Review 6

2.1 2022 Valuer-General Review 6

3.0 Approach to property prices 7

3.1 Flood affectation can impact property prices 7

4.0 Waverley LGA Property Market 8

4.1 Number of Dwellings 8
4.2 Price and Market Trends 8

5.0 Analysis 9

5.1 DCP Control Analysis 9
5.1.1 Descriptive statistics and distribution analysis 10
5.1.2 Model One – Flood Affectation 11
5.1.3 Model Two – High and Medium Flood Affectation 12
5.2 LEP Flood Affectation Analysis 12
5.2.1 Descriptive statistics and distribution analysis 13
5.2.2 Model One – Two Variable 14
5.2.3 Model Two – Three Variable 14
5.3 Case Study Properties – High Flood Risks 15
5.4 Case Study Properties – Medium Flood Risk 16

6.0 Findings 17

Tables

Table 1 Dwelling Structure of Waverley LGA (ABS) 8
Table 2 Flood Affectation of Properties transacted from 30 June 2022 and 23 February 2023 (HillPDA, Valuer General) 10
Table 3 Descriptive Statistics (HillPDA) 10
Table 4 Transaction summary 15
Table 5 Transactions in Rose Bay 16

Figures

Figure 1 Flood Maps 5
Figure 2 Average Residential Property prices in Waverley LGA 9
Figure 3 Box and whisker chart for Waverley LGA properties 11
Figure 4 Histogram of sales prices in Waverley LGA ($m) and logarithmically transformed sales prices 11
Figure 5 Histogram of sales prices in Waverley LGA and logarithmically transformed sales prices in the LGA. 13
Figure 6 Map of North Bondi study area (north of Murriverie Road) 15

Quality Assurance

Report Contacts

Sam Stone

Associate

Bachelor of Economics (Sydney), Graduate Certificate in Business Administration (QUT)

Sam.stone@hillpda.com

Supervisor

Martin Hill AM

Director

M.Real Estate (UNSW), M.Property Development (UTS), BSc (Hons),

Certified Practicing Valuer (Unrestricted), FAPI,

Martin.Hill@hillpda.com

Quality Control

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EXECUTIVE SUMMARY

Waverley Council has engaged HillPDA to consider the impact that proposed flood controls would have on property prices within the LGA. The proposed flood controls seek to identity properties as high, medium, and low risk for flooding. The flooding refers to the accumulation of overland flows, so relates to excess stormwater.

The identification of land as being potentially flood (stormwater) affected is on its own unlikely to have a material impact on property prices in Waverley over time.

While there has been limited academic literature looking at flooding through the accumulation of overland flow, there has been literature that looks at riverine and coastal flooding. In general, flooding will have an impact on prices once inundation has been occurred, resulting in lower prices for flood affected properties. Over time the price gap between flood affected and non-flood affected properties tends to reduce, as the flood affected prices normalise. Therefore, ***it is unlikely that the identification of flood risk on its own would result in a sustained price impact on property prices in Waverley.***

Through an analysis of the actual prices of identified flood affected and non-flood affected prices of properties transacted in Waverley LGA, there was not an economically or statistically significant relationship between the price of the property and if it was identified as flood affected. This was tested through:

- Reviewing transactions of properties in Waverley LGA once the DCP amendments were placed on exhibition and therefore the flood affectation was included in the section 10.7 certificate, which was a part of the contract of sale. Regression analysis and statistical testing found that those that were flood affected did not have a statistically significant lower price than those that were not flood affected. It also found that when looking at medium and high-risk properties alone that were transacted there was not a meaningful relationship between price and flood risk identification observed.
- The Waverley LEP has identified properties that are at risk of flooding, and these properties have been identified since at least 2012. Considering the transactions on those properties compared to those not flood affected between 2001 and 2022, no statistically significant relationship between flood risk identification and price was observed when controlling for time and property type.

In our view, the key determinant of property price in the Waverley LGA is the attraction of the coastal lifestyle proximity to the Sydney CBD, and access to high quality retail, and schools in both Waverley and the surrounding area. This culminates in a highly attractive location, where people want to move, which is the key determinant of house prices, and results in premium property prices.

If sustained and observable inundation were to occur, because of regular storm activity, it is likely that there would be a negative impact on prices. This impact would occur regardless of any prior identification of flood risk because the actual experience of flooding would have an observed impact on the quality of the property. However, the early identification of the risk and prudent works to minimise any flood risks would have a marginal impact on price, up to the cost of the works, and prevent any greater downward pressure on price from regular inundation.

Up to now, ***we have not seen evidence of price impacts because of the identification of flood affectation in the Waverley LGA.***

1.0 INTRODUCTION

HillPDA has been engaged by Waverley Council to review the impact of proposed flood planning controls on property values in Waverley LGA.

1.1 Background

The Waverley Flood Study commenced in 2017 and was an initial step toward a toward a Floodplain Risk Management Study and Plan in accordance with NSW Floodplain Development Manual (2005) it defined flood prone land across the LGA. The study was finalised in January 2021 and endorsed by council in April 2021.

As a response to the study the Council proceeded to make LEP and DCP amendments based on the recommendations of the study. These recommendations sought to map the extent of potential flood risk in the LGA and sought to introduce new controls.

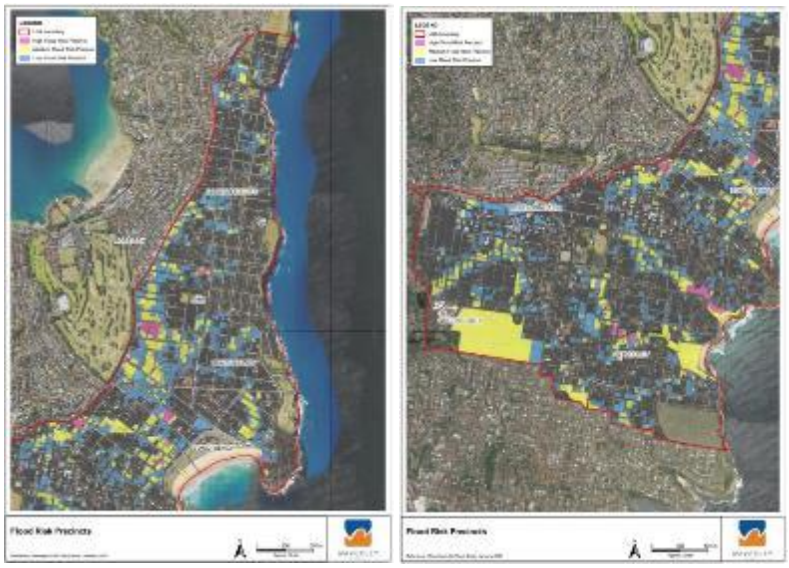
1.2 Definition of Flooding

The Waverley Flood Study refers to the accumulation of overland flows as flooding and to the hydraulic modelling used to represent this process as flood modelling, which would be defined as "stormwater" for the assessment of insurance claims.

1.3 Proposed DCP Controls

As part of the proposed DCP amendments, Council mapped properties as "high", "medium", and "low" risk.

Figure 1 Flood Maps



The proposed DCP incorporated controls around required floor levels, structural soundness, driveway access, and design access to help mitigate the impact of flooding on the property.

1.4 Purpose of the study

There was significant community concern about the impact of identification as medium or high flood risk on property prices within the LGA. The purpose of this study is to quantify the impact that the proposed measures would have on property prices in the LGA.

2.0 LITERATURE REVIEW

This section reviews the relevant literature that has been released in relation to the impact of flooding on property prices.

The impact of flooding characterised by overland flow, typical of the Waverley Flood Study, on prices has not been studied as extensively as riverine flooding. Overland flow can have a risk to property and life; however, the frequency and impact of riverine flooding (most recently experienced in the Hawkesbury-Nepean and the Northern Rivers) can represent a significant risk to property or life. Much of the literature has focussed on riverine flooding, we consider that these learnings on property prices are relevant to Waverley, because they represent a much more extreme version of flooding than would be experienced in Waverley.

Overall, the impact of the flooding on prices can be summarised as there is no significant difference in property values in flood zones during periods of no flooding. When flooding occurs, there has usually been a reduction in value of the property, which then quickly recovers over time.

- Fletcher et al. (2022), *The Behaviour of property prices when affected by infrequent floods* studied price shifts in Brisbane following the 2011 Floods. It found that prices in flood zone were equivalent to the zero-risk zone when major events are in the past, immediately after minor or major flood events prices would decline, but then recover within a few years. Therefore, it is possible that the market depreciates the risk of flooding over time or forgets the risk. The authors hypothesise that frequent flooding could result in a lasting change in the valuation of risk.
- Beltran et al. (2019), *The Impact of flooding on property prices: A repeat-sales approach* studied the impact of flooding on property prices in England between 1995 and 2014. Using repeat sales, it found that there was an immediate decline of 21.1% where coastal flooding occurred and the property was inundated however, after 4 years the discount experienced as a result of flooding is removed by the market and there is not statistically significant difference in price between properties affected by flooding and those that were not. For coastal properties in the top quartile, which reflects properties in Waverley, the prices recovered after 2 years, and the discount was only 10.5%.
- Bin O, et al. (2008), *Flood hazards, Insurance rates and amenities* studied the impact of identification of flood risk in Carteret County North Carolina, which is a lower cost housing area in the United States. This found a 7.3% reduction in house sales price due to being identified as flood risk, noting that this referred to riverine flooding. We also note that this incorporated housing within a 1:100 riverine flood zone, which would not be permitted in NSW, and not relevant for Waverley LGA.

Overall, the literature has identified that prices tend to recover after inundation in Brisbane and the UK. This indicates that there is unlikely to be discounting because of the identification of flood risk.

2.1 2022 Valuer-General Review

In November 2022, the NSW Valuer General issued its *Review of the impact of flooding on the 1 July 2022 land values*. This review sought to determine the impact on valuations on 1 July 2022 following the severe flooding at the start of the 2022. The study for Northern NSW was based on market transactions and had the following findings:

- Areas with limited flood impact have remained stable with some increases
- Moderately impacted areas have decreased in land value by up to 10%
- Up to 35% reduction in the most significantly impacted areas, predominately Lismore

The Hawkesbury LGA mostly saw an increase in land values; however, for the most significantly impacted area along the Hawkesbury river between Richmond and Wilberforce land values have decreased by 20% from 2021.

Overall, we consider that the flooding in Waverley would be limited in nature compared to the moderately or significantly impacted flooding in the areas. Therefore, we consider that the identification of flooding would likely have a minimal negative impact on prices in the LGA.

3.0 APPROACH TO PROPERTY PRICES

The fair market value is the price that property changes hands between a willing buyer and willing seller. A buyer is seeking several factors including:

- Location
- Size
- Amenities
- Building quality
- Capacity to pay

The cumulative nature of all these factors will determine the buyers that are interested in the property, and their capacity to pay. Home purchasers will tend to make trade-offs and purchase up to their capacity to pay, which is usually set externally by availability of financing.

A seller is often seeking to maximise the sale price, and therefore will accept an offer either through an auction or private treaty that they believe is the highest offer for the price.

Some these factors influence the value of the underlying land and then others are related to the capital improvements. The reason that property prices in Waverley tend to be more expensive than in other areas is because the underlying value of the land is high reflecting its proximity to the CBD and beaches.

Often external factors can influence prices in the short-term, sometimes up to ten percent of the estimated value of the properties, an example would be the exhaust from a tunnel or sewer ventilation shafts. The impact on price has been greatest when it is first installed then overtime prices tend to normalise, and recover to the point that it becomes indistinguishable, unless it has a sustained and noticeable impact.

3.1 Flood affectation can impact property prices

Flood affectation would impact property prices in three ways:

- **Risk discount to cost of flooding**, whereby a prospective purchaser considers the risk of inundation and flood impacts and therefore offers a lower price considering that risk, or perceived loss of amenity. This is where, for example, significantly increased insurance costs may impact the development.
- **Augmentation discount**, whereby additional works or augmentation of the asset needs to occur to meet new flood controls. It is likely that this discounting would most likely be considered where the site is being considered for re-development or substantial renovations. This discounting would result in a purchaser considering the additional cost of works as part of the overall investment in the property, and therefore reduce their willingness to pay. Our review of the controls is that they are generally minor and manageable, often requiring increased floor levels. They also do not require proactive work completed on properties that are already completed. Therefore, these costs will most likely be considered on the general market for properties that are substantially run down or underutilised, where work would be required anyway. Therefore, we consider that it could have a marginal impact on property prices.
- **Discount due to limited re-development opportunity**, whereby the flood controls limit redevelopment opportunities. If the flood controls were to reduce the re-development permissibility for the site, then the reduced opportunity would be reflected in a lower acquisition price to reflect the new maximum allowable use for a development. Council has advised HillPDA that the flood controls proposed largely

do not limit redevelopment opportunity, except for seniors living and some sensitive uses. Overall, we consider that the risk discounting would occur for development opportunities in the LGA.

The risk discounting to flooding has tended to focus on areas with catastrophic riverine flooding, or lower incomes with more sensitivity to ongoing price changes such as insurance premiums. The Waverley housing market is more likely to be driven by the highly desirable location and amenity of the local area characterised with proximity to beaches, entertainment, open space, and lifestyle features.

4.0 WAVERLEY LGA PROPERTY MARKET

This section assesses the housing stock of the property market in the Waverley LGA and seeks to identify key trends in prices in the LGA.

4.1 Number of Dwellings

There are 32,775 private dwellings in Waverley of which 27,455 are occupied (ABS, 2021). The table below outlines the number and percentage of the type of occupied private dwellings in the Waverley LGA at the 2021 Census. Across the LGA 12,321 properties were identified as flood affected.

Table 1 Dwelling Structure of Waverley LGA (ABS)

Dwelling Structure	Waverley (no.)	Waverley (%)	Greater Sydney (%)
Separate House	4,405	16.0	55.8
Semi-detached, row or terrace, townhouse etc	4,969	18.1	12.8
Flat or apartment	17,590	64.1	30.7
Other	443	1.6	0.4

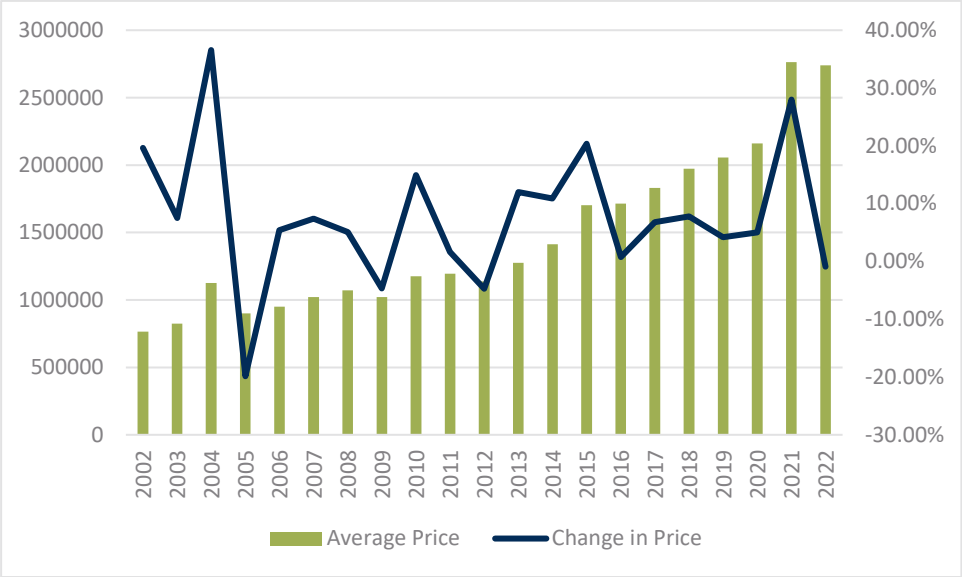
Nearly two-thirds of dwellings are flats or apartments, which means that the price for the dwelling is determined by a greater proportion of the built-form cost, with the underlying land value being less reflective in the cost of the apartment. This is because the cost of the underlying land is shared across each of the apartment dwellings.

The impact of flood affectation is less likely to influence the price of an apartment than the price of a separate home, because individual properties may not be affected as much, the cost to develop flood defences is shared by the strata, and apartments tend to be well-located near amenity, which is a key price determinant.

4.2 Price and Market Trends

The housing market in Waverley has seen significant price increases between July 2021 and 2022 for both residential and commercial land values, the trend has been attributed to the ongoing demand in the Eastern Suburbs due to its desirable location, close to beaches, commercial centres, the CBD, and transport. Between 2019 and 2022 there was a 56.22% increase in the land value of the residential zone category (Valuer General, 2022).

Figure 2 Average Residential Property prices in Waverley LGA



Source: HillPDA 2023, Valuer General Property Sales

Figure 2 shows that there has been substantial price growth in Waverley over the last 20 years as the areas has become more attractive. The ABS residential price index increased 156% in Greater Sydney between September 2003 to December 2021, over the same period prices in Waverley grew by 236%.

Between January 2018 and March 2023 house prices in Greater Sydney grew on average 7% between the two periods, whereas house prices in Waverley grew 15%.

The Waverley market is a premium housing market. It has had faster price growth than the Greater Sydney average, indicating it is a highly attractive market for many people. Based on these accelerated prices we consider that a multitude of factors are driving people to the LGA.

5.0 ANALYSIS

This section analyses the price impacts for the properties that were identified in the DCP amendments. It also analyses the impact of flood identification under the LEP, which have been identified for a longer period of time. Finally, it undertakes some case studies of particular transactions.

5.1 DCP Control Analysis

HillPDA identified transactions where the contract was exchanged from 30 June 2022 and settled by 23 February 2023. This covers from the time the DCP amendment was placed on exhibition from 23 June to 21 July 2022, when the draft affectation was placed on the section 10.7 certificate included on the contract.

Utilising Valuer General data, HillPDA has identified the transactions that occurred in the period and the properties that were flood affected during the period. During that period there were 608 transactions of which 239 were flood affected properties reflecting approximately 40% of the transactions in the Waverley LGA at the time.

Table 2 Flood Affectation of Properties transacted from 30 June 2022 and 23 February 2023 (HillPDA, Valuer General)

Flood Affectation	Number of Sales
High	9
Medium	78
Low	152
None	369
Total	644

5.1.1 Descriptive statistics and distribution analysis

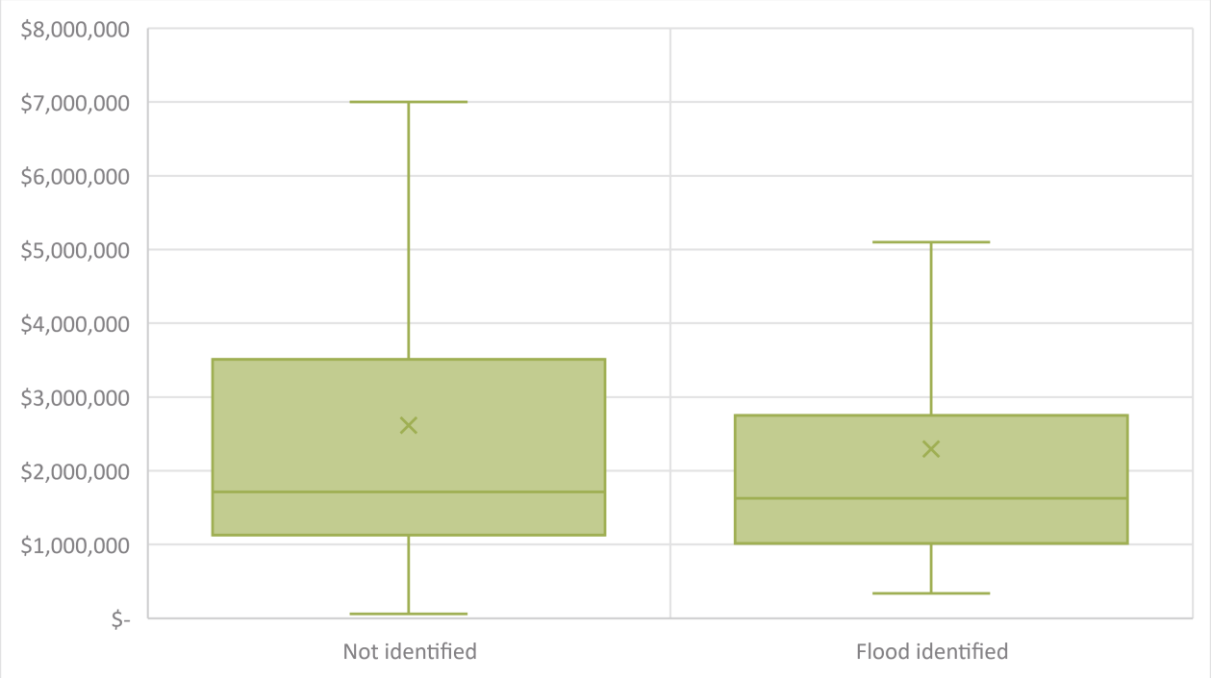
The descriptive statistics for the transactions are outlined in Table 3. The average and the median for a non-flood affected property is in general higher than a flood affected property. Statistical testing will check if the difference in affectation is responsible for the difference, or if the conclusion has statistical significance. As each sample has a high standard deviation and variance, there are a number of different factors that are impacting on prices achieved by individual properties such as location, property size, and type.

Table 3 Descriptive Statistics (HillPDA)

	Total Transactions	Non-Flood Affected	Flood Affected
Mean	2,491,462	2,618,300	2,295,632
Standard Error	91,998	126,761	127,627
Median	1,682,500	1,712,500	1,627,500
Mode	1,200,000	1,200,000	6,000,000
Standard Deviation	2,268,465	2,434,994	1,973,072
Sample Variance	5,145,935,497,604	5,929,194,367,770	3,893,014,090,476
Kurtosis	10	10	9
Skewness	3	3	2
Range	18,215,000	18,215,000	14,860,000
Minimum	60,000	60,000	340,000
Maximum	18,275,000	18,275,000	15,200,000
Sum	1,514,808,940	966,152,871	548,656,069
Count	608	369	239

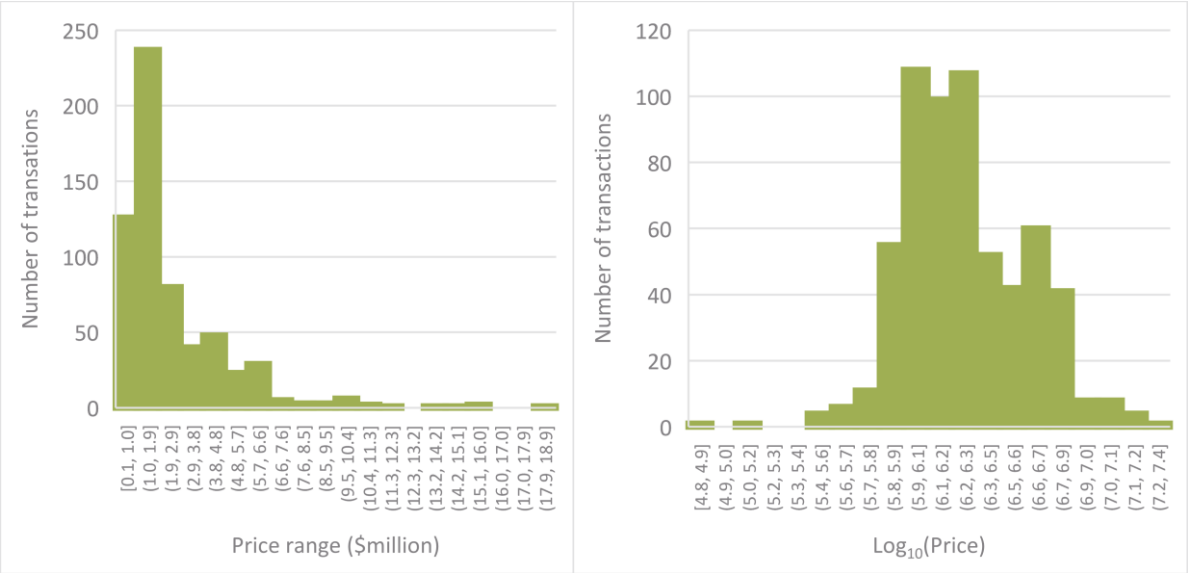
Figure 3 shows the interquartile range and prices excluding outliers both non flood affected, and flood identified properties in the LGA transacted over the period. The data is skewed with many of the observations within the $1m to $1.94m range (Figure 4), reflecting that 440 of the sales were strata sales. Since many statistical tests assume a normal distribution, the data set for prices was logarithmically transformed to allow for statistical testing. This resulted in a broadly normally distributed data set to allow for analysis, as shown in Figure 3.

Figure 3 Box and whisker chart for Waverley LGA properties



Source: HillPDA 2023, Valuer General

Figure 4 Histogram of sales prices in Waverley LGA ($m) and logarithmically transformed sales prices



HillPDA 2023

5.1.2 Model One – Flood Affectation

HillPDA prepared a linear regression model to test the impact that a dummy variable of flood affectation had on the properties at the time, with the following equation:

$$\hat{Y}_i = \alpha + \beta X_1$$

Where:

$\hat{Y}_i$ referred to logarithmic transformation of the property price

X_i referred to a dummy variable of identified flood affectation, where *X* was equal to 1 then the property was flood affected.

Statistical testing is a data analysis testing tool to see if there are meaningful results from a variable. The t-test determines if a single variable is statistically significant, by quantifying the relationship between the individual explanatory variable (identified flood affectation) and the dependent variable (property price). It seeks to confirm if there is a strong relationship between the variables. The F-test seeks to test if the model is jointly significant, this looks at explanatory variables within the model. This is more important in multi-variable models (such as those used in the LEP flood affectation analysis).

There was not a statistically significant relationship between flood affectation and the change in price in the model. The t-test and f-test both resulted in values that fell outside of the rejection range, which means any variation could be due to chance or other factors. The observed F-value was 1.98, whereas the critical f-Value needed was 3.01, that is the observed F-value needed to be greater than the critical F-value. The observed t-value was also lower than the critical t-value. Similarly, the explanatory power of the model was approximately 0.03% through the observed R^2 value.

Therefore, identification as being potentially flood affected in the DCP has not been a useful variable in predicting price on transactions where contracts were exchanged from 30 June 2022 and settled by 23 February 2023.

5.1.3 Model Two – High and Medium Flood Affectation

HillPDA modelled the impact of a property being identified as possessing high or medium flood risk. The model had an R^2 of 0.0051 which means it accounted for 0.51% of the variation in prices between high and medium flood affected properties compared to low or non-flood affected properties. This would imply that other factors external to the model (such as location, property size, or building quality) had a much more substantial impact on prices than the identification of flood affectation. Similarly, the observed t-value was below the critical t-value to be statistically significant. This means the reduction in property prices observed in the model would likely be due to other factors external to the model.

5.2 LEP Flood Affectation Analysis

Prior to the release of the DCP amendments, 942 properties were identified as flood affected in the LEP. HillPDA has analysed the transactions on these properties between 2012 and 2022. There have been 393 transactions related to these properties between 2012 and 2022 and 20,016 transactions in total in the LGA.

5.2.1 Descriptive statistics and distribution analysis

	Total Transactions	Non-Flood Affected	Flood Affected
Mean	2,035,472	2,031,699	2,223,857
Standard Error	26,971	27,393	127,430
Median	1,325,000	1,320,000	1,605,000
Mode	1,100,000	1,100,000	1,120,000
Standard Deviation	3,815,867	3,837,220	2,526,207
Sample Variance	14,560,839,719,993	14,724,255,677,680	6,381,723,445,682
Kurtosis	5,662	5,648	123
Skewness	57	58	9
Range	395,234,640	395,234,640	39,569,544
Minimum	100	100	16,750
Maximum	395,234,740	395,234,740	39,586,294
Sum	40,742,003,633	39,868,027,831	873,975,802
Count	20,016	19,623	393

HillPDA 2023, Valuer-General

The distribution of transactions is similarly skewed rightward as shown in Figure 5. Therefore, a logarithmic transformation was applied to make the data suitable for analysis as the data become normal enough for the statistical tests.

Figure 5 Histogram of sales prices in Waverley LGA and logarithmically transformed sales prices in the LGA.

HillPDA, 2023

5.2.2 Model One – Two Variable

HillPDA has analysed the difference in the prices for these properties through a multiple linear regression model, which controlled for the change in time over the period by including a variable for time in addition to the dummy variable for flood affectation. It was expressed

$$\hat{Y}_i = \alpha + \beta X_1 + \beta X_2$$

Where:

$\hat{Y}_i$ referred to the property price

X_1 referred to a dummy variable of flood affectation, where *X* was equal to 1 then the property was flood affected.

X_2 referred to the transaction date.

HillPDA tested both logarithmically transformed prices for this model. The inclusion of the transaction date for this variable reflected the over 20-year time horizon because there has been significant price growth as discussed in section 4.2 so time would explain for a large amount of variation in prices in the data set. Statistical significance refers to the robustness of the conclusions, economic significance refers to the likely impact or materiality of the variation. For example, a statistically significant variation in prices of 0.05% would be unlikely to be economically significant.

When prices were logarithmically transformed a statistically and economically significant relationship was identified. A property that was identified as flood affected in the LEP sold for 6% more on the average, than property that was not flood affected. Overall, the model had a low explanatory power, only 8.6% of the variation in prices can be explained by the model. Therefore, this suggests other factors may be more important in determining property prices than flood affectation. Furthermore, since the model's conclusion does not make intuitive or logical sense, we consider the identification of flood affectation must be correlated with another factor that could be confusing the results. Therefore, HillPDA has assessed other models.

5.2.3 Model Two – Three Variable

An additional three variable model was used looking at residential property. This model sought to add an additional control for property type, and expressed as:

$$\hat{Y}_i = \alpha + \beta X_1 + \beta X_2 + \beta X_3$$

Where:

$\hat{Y}_i$ referred to the property price

X_1 referred to a dummy variable of flood affectation, where *X* was equal to 1 then the property was flood affected.

X_2 referred to the transaction date.

X_3 referred to the type of property, that is whether it was a house or a unit, where when where *X* was equal to 1 then the property was a house.

This model explained 28% of the variation in prices in the LGA over the period. The variables for transaction date and property type were economically and statistically significant. The variable for flood affectation was economically significant with the identification of flood affectation accounting for 3.4% higher prices on the average than no, but these were not statistically significant. An additional model that accounted for different suburbs was developed and found that there was a statistically insignificant and economically insignificant relationship between property prices and flood affectation when accounting for variations due to suburbs.

5.3 Case Study Properties – High Flood Risks

North Bondi has a high-risk flood area. It also has properties that were identified as flood affected under the LEP, in addition to some properties that were identified as flood affected in the DCP.

Figure 6 maps the study area and properties that were transacted in North Bondi, north of Murriverie. There were 17 properties transacted, their flood affectation (at the time of transaction) is shown in blue for flood affected properties in the map. The transaction details and summary of key property features are identified in Table 4.

Figure 6 Map of North Bondi study area (north of Murriverie Road)

HillPDA 2023

Table 4 Transaction summary

Address	Contract Date	Sale Price ('000)	Area	$/m²	LEP Flood Identified	Bed	Bath	Parking
10 MURRIVERIE RD NORTH BONDI	11/01/2022	$5,450	303.5	$17,957	1	5	3	2
130 MURRIVERIE RD NORTH BONDI	24/01/2022	$7,050	404.7	$17,420	0	5	5	2
9 MACLEAY ST NORTH BONDI	16/02/2022	$6,125	632.3	$9,687	0	4	4	2
90 CLYDE ST NORTH BONDI	14/03/2022	$6,500	594.4	$10,935	0			
34 CLYDE ST NORTH BONDI	4/05/2022	$4,020	215	$18,698	0	4	2	1
18 MURRIVERIE RD NORTH BONDI	5/05/2022	$7,625	327.67	$23,270	1	5	3	3
28 OWEN ST NORTH BONDI	19/05/2022	$3,750	215	$17,442	0	3	3	2
11 CLYDE ST NORTH BONDI	19/05/2022	$7,100	771.4	$9,204	0			Block of flats
24 MURRIVERIE RD NORTH BONDI	1/06/2022	$6,100	360.4	$16,926	1	5	3	2
38 STEWART ST NORTH BONDI	2/06/2022	$3,700	221.25	$16,723	0	3	3	1
2 HARDY ST NORTH BONDI	6/06/2022	$4,800	457.25	$10,498	0	5	3	2
32 ROE ST NORTH BONDI	28/06/2022	$4,300	215	$20,000	1	4	3	1
25 A STEWART ST NORTH BONDI	30/06/2022	$4,375	302	$14,487	0	4	3	1
23 STEWART ST NORTH BONDI	2/08/2022	$3,420	221.3	$15,454	0	4	2	0
16 OWEN ST NORTH BONDI	9/08/2022	$4,600	218	$21,101	1	4	3	1
63 MURRIVERIE RD NORTH BONDI	23/08/2022	$6,100	366.7	$16,635	0	5	3	3
23 OWEN ST NORTH BONDI	26/08/2022	$6,375	423.7	$15,046	1	4	4	2

Source: HillPDA

The average price per square metre in the study area for a flood affected property was higher than the average price per square metre for a non-flood affected property in the study area. For example, the per square metre rate of 10 Murriverie Road was higher than that of 130 Murriverie Road, which likely indicates improved condition. While the flood affectation may have had some downward pressure on the prices, it is not highly noticeable.

32 Roe Street is a semi-detached flood affected property, it had four bedrooms, three bathrooms, and a single car parking space, which was renovated with an additional storey sometime between 2011 and 2013. 25A Stewart Street was built in 2012 it is a semi-detached property also with four bedrooms, three bathrooms, and a single car parking space. 25A Stewart Street sold for $75,000 more than 32 Roe Street in June 2022, despite having approximately 80 additional square metres in land area, and a swimming pool. They also appear to have similar internal areas. It is unlikely that there has been a negative impact of flood affectation on the 32 Roe Street.

At least two properties were sold as development sites, 16 Owen Street was sold as a potential dual occupancy development site, and 11 Clyde St was sold as a block of flats. Both sites have development potential, interestingly the dual occupancy flood affected site sold for a higher per square metre rate.

5.4 Case Study Properties – Medium Flood Risk

HillPDA has reviewed flood impact for medium risk properties in Rose Bay focussed on William Street, The Avenue and Chaleyer Street. During the study period there were 18 transactions of which 17 had sufficient information to be able to assess the property. These were mostly apartment developments, we would consider that these theoretically would have a lower responsiveness to potential flood risk, because they may be further raised form the ground. These properties are summarised below

Table 5 Transactions in Rose Bay

Address	Sale Month	Sale Price	Internal Size	Beds	Baths	Parking	Flood Risk
16/33-35 William St, Rose Bay	December 2022	1,195,000	77	2	1	1	Low
2/33-35 William St, Rose Bay	December 2022	630,000	41	1	1	1	Low
17/33-35 William St, Rose Bay	December 2022	705,000	41	1	1	1	Low
1/21 William St Rose Bay	October 2022	1,671,000	86	2	1	1	Medium
1/15 William Street Rose Bay	October 2022	2,100,000	111	3	2.5	1	Medium
11/3 William Street Rose Bay	October 2022	1,700,000	107	2	2	2	Medium
5/37 William Street Rose Bay	September 2022	1,100,000	61	2	1	1	Low
5/47 Chaleyer Street Rose Bay	November 2022	1,081,000	90	2	1	1	Nil
4/65 Chaleyer Street Rose Bay	October 2022	580,000	80	2	2	0	Nil
4/48 Chaleyer Street Rose Bay	September 2022	1,220,000	100	2	1	1	Nil
2/84 Chaleyer Street Rose Bay	September 2022	1,700,000	187.2	3	1	1	Nil
7/18 Chaleyer Street Rose Bay	September 2022	1,310,000	141.7	2	1	1	Low

6/18 The Avenue Rose Bay	November 2022	765,000	47	1	1	1	Med
6/37 The Avenue Rose Bay	August 2022	1,275,000	64	2	1	1	Nil
9/37 The Avenue Rose Bay	August 2022	1,370,000	78	3	1	2	Nil
3/4 The Avenue Rose Bay	August 2022	2,025,000	117	2	2	2	Low
1/2 The Avenue Rose Bay	August 2022	2,100,000	300	3	2	3	Low

In general properties that had medium flood risk were substantially larger in William Street, so not directly comparable to those with low flood risk. These were garden apartments with large court yards, which resulted in higher prices being achieved; however, it is possible that garden apartments, being on the ground flood would be more exposed to the risk of inundation if flooding were to occur. Unit 6/18 The Avenue is somewhat equivalent to the low flood risk properties at 33-35 William Street, and the price differential with the property on the Avenue selling for more in a similar time is unlikely to indicate that there has been discounting because of flooding for apartments in the Rose Bay Area.

Indicative regression analysis of the transactions above controlling the flood risk for the calculated internal size, the bedrooms, bathrooms, and parking, indicates that flood affectation was positively correlated with higher prices; however, this was not statistically significant, which means the result could be due to chance.

6.0 FINDINGS

Flood affectation can have an impact on property prices, where the risk of flooding provides substantial limitations on the ability to develop land, or in the period immediately after inundation. In relation to the transactions observed in the Waverley LGA, where flood affectation has been listed on the contract of sale:

- There has not been a statistically significant relationship between the identification of flood affectation in the DCP and the property prices in the LGA identified in the transaction that were observed between 30 June and 23 February 2023.
- There has not been a statistically significant relationship between the prices observed in properties identified as flood related in the Local Environment Plan between 2012 and 2022, when controlling for property type and time.

The academic literature has not supported a relationship between flood identification and price discounts, except in the immediate aftermath of the flood. It is unlikely that potential of overland flow flooding that has been experienced in Waverley will result in the substantial and noticeable discounting in price on potentially impacted properties. Where a property is abnormally affected discounting might occur, we consider that this discount would likely occur without the additional identification of flood risk in the DCP, because:

- The property may have already been identified in the LEP
- The impact of the flooding on the property might be able to be seen in the property, and present itself during a prudent buyer's due diligence process

Where a property is identified as flood affected and its development potential is limited, then there may be a price impact. However, that needs to be weighed against the sensitivities of uses and safety considerations.

The proposed controls in the DCP, mostly focussed on responding and mitigating against risk, may have a marginal impact on price where a property is transacted for the purpose of a substantial renovation, because there might be slightly higher costs to complete the renovation.

Overall, we cannot identify an economically or statistically significant relationship between the identification of a property being potentially flood affected and property prices across Waverley LGA.

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SYDNEY

Level 3, 234 George Street
Sydney NSW 2000
GPO Box 2748 Sydney NSW 2001
t: +61 2 9252 8777
f: +61 2 9252 6077
e: sydney@hillpda.com

MELBOURNE

Suite 114, 838 Collins Street
Docklands VIC 3008
t: +61 3 9629 1842
f: +61 3 9629 6315
e: melbourne@hillpda.com

WWW.HILLPDA.COM