

# Lurline Bay, Matraville, Malabar & Yarra Bay Flood Study

Final Report

Volume 2 of 2: Figures



## ► FIGURES

- Figure 1: Lurline Bay, Matraville, Malabar & Yarra Bay Stuy Area
- Figure 2: Existing Datasets
- Figure 3: Location of Rainfall and Stream Gauges
- Figure 4: Digital Elevation Model
- Figure 5: Remote Sensing Land Use Map
- Figure 6: Additional Information Collected for Study
- Figure 7: XP-RAFTS Model Layout
- Figure 8: TUFLOW Model Layout

### Calibration Figures

- Figure 9: Isohyet Map for 2020 Storm
- Figure 10: Simulated Floodwater Depths for 2020 Flood
- Figure 11: Isohyet Map for 2016 Storm
- Figure 12: Simulated Floodwater Depths for 2016 Flood
- Figure 13: Isohyet Map for 2015 Storm
- Figure 14: Simulated Floodwater Depths for 2015 Flood

### Design Floodwater Depth and Levels Figures

- Figure 15: Peak Water Depths for the 1EY Flood
- Figure 16: Peak Water Depths for the 0.5EY Flood
- Figure 17: Peak Water Depths for the 0.2EY Flood
- Figure 18: Peak Water Depths for the 10% AEP Flood
- Figure 19: Peak Water Depths for the 5% AEP Flood
- Figure 20: Peak Water Depths for the 2% AEP Flood

- Figure 21: Peak Water Depths for the 1% AEP Flood
- Figure 22: Peak Water Depths for the 0.5% AEP Flood
- Figure 23: Peak Water Depths for the 0.2% AEP Flood
- Figure 24: Peak Water Depths for the PMF

### Design Flow Velocity Figures

- Figure 25: Peak Flow Velocity for the 1EY Flood
- Figure 26: Peak Flow Velocity for the 0.5EY Flood
- Figure 27: Peak Flow Velocity for the 0.2EY Flood
- Figure 28: Peak Flow Velocity for the 10% AEP Flood
- Figure 29: Peak Flow Velocity for the 5% AEP Flood
- Figure 30: Peak Flow Velocity for the 2% AEP Flood
- Figure 31: Peak Flow Velocity for the 1% AEP Flood
- Figure 32: Peak Flow Velocity for the 0.5% AEP Flood
- Figure 33: Peak Flow Velocity for the 0.2% AEP Flood
- Figure 34: Peak Flow Velocity for the PMF

### Stormwater Capacity Figure

- Figure 35: Stormwater Capacity

### Flood Hazard Figures

- Figure 36: Flood Hazard for the 1% AEP Flood
- Figure 37: Flood Hazard for the 0.2% AEP Flood
- Figure 38: Flood Hazard for the PMF

### Hydraulic Category Figures

- Figure 39: Hydraulic Categories for the 1% AEP Flood
- Figure 40: Hydraulic Categories for the 0.2% AEP Flood



Figure 41: Hydraulic Categories for the PMF

**Flood Emergency Response Classification Figures**



Figure 42: Flood Emergency Response Classifications for the 1% AEP Flood




Figure 43: Flood Emergency Response Classifications for the 0.2% AEP Flood




Figure 44: Flood Emergency Response Classifications for the PMF

**Flood Planning Figures**



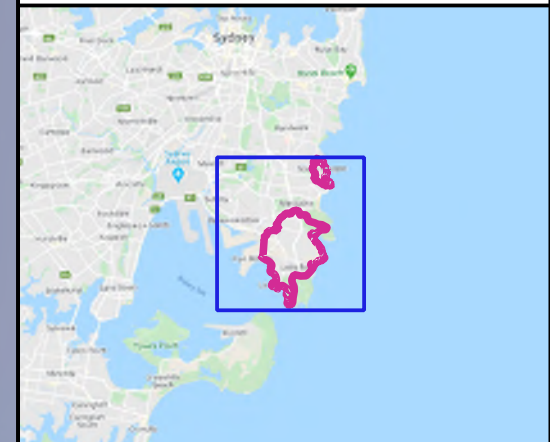
Figure 45: Interim Flood Planning Areas and Tagged Properties



Figure 46: Flood Planning Constraint Categories



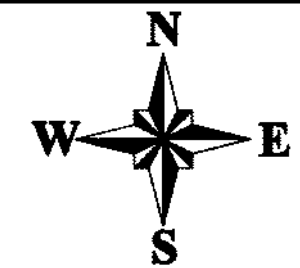




### LEGEND


-  Lurline Bay Catchment
-  Matraville Catchment
-  Yarra Bay Catchment
-  Malabar Catchment
-  Watercourse

Notes:  
Aerial photograph: Google Satellite 2019



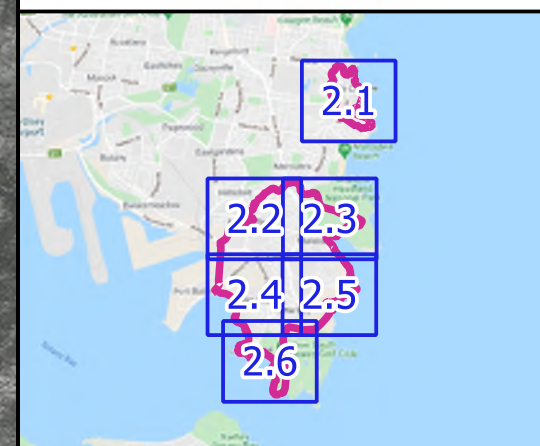
Scale: 1:30000 (at A3)  
0 300 600 900 1200 m

**Figure 1:  
Lurline Bay, Matraville,  
Malabar, Yarra Bay Flood  
Study Area**

Prepared by:  
 **Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Lurline Bay, Matraville, Malabar, Yarra Bay  
Flood Study Area.qgz  
Using Layout: Figure 1





## LEGEND

### Structures

- Stormwater Pipe/Culvert
- Stormwater Pit
- GPT

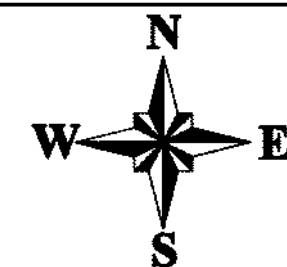
### Topographic Data

- 2005 ALS/2013 LiDAR
- 2020 LiDAR

### Preliminary Flood Extents

- 1%AEP
- PMF
- Critical/Vulnerable Facility

Notes:  
Aerial photograph: Google Satellite 2019.  
Preliminary flood extents extracted from 'Simplified Flood Modelling for Lurline Bay, Matraville, Malabar, Yarra Bay and Clovelly Catchments' (BMT, 2018).



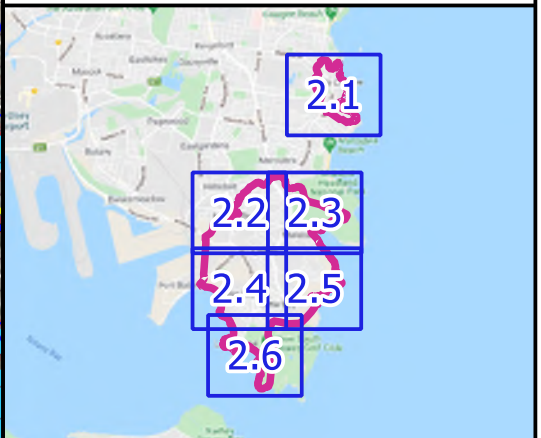
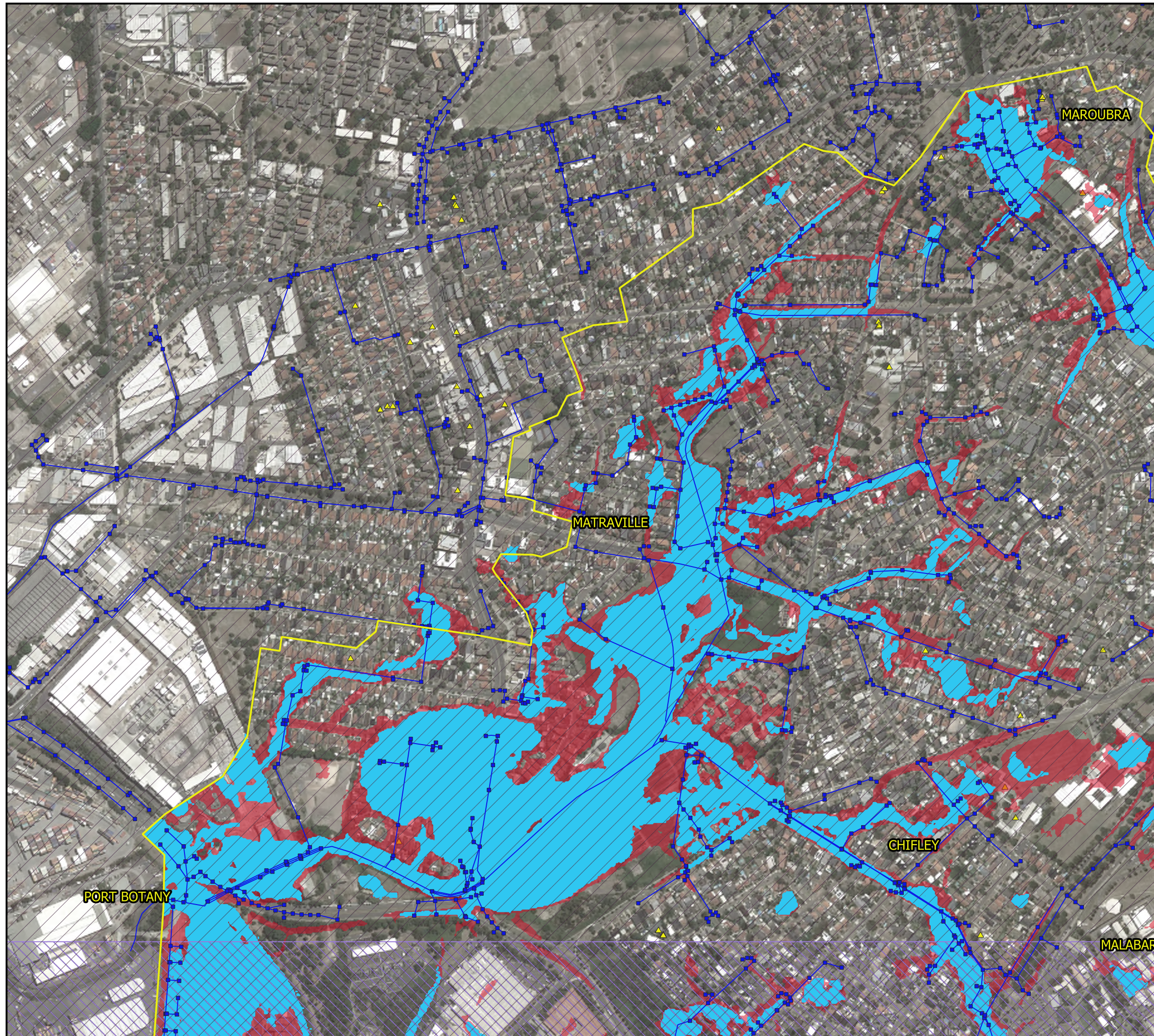
Scale: 1:7000 (at A3)  
0 80 160 240 320 m

**Figure 2.1:  
Existing Datasets**

Prepared by:  
**Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Existing Datasets.qgz  
Using Layout: Figure 2.1

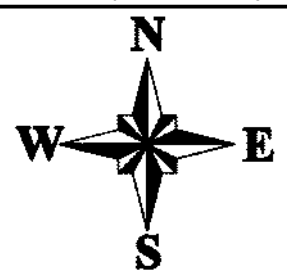




### LEGEND

- Structures**
- Stormwater Pipe/Culvert
  - Stormwater Pit
  - GPT
- Topographic Data**
- 2005 ALS/2013 LIDAR
  - 2020 LIDAR
- Preliminary Flood Extents**
- 1%AEP
  - PMF
  - Critical/Vulnerable Facility

Notes:  
Aerial photograph: Google Satellite 2019.  
Preliminary flood extents extracted from 'Simplified Flood Modelling for Lurline Bay, Matraville, Malabar, Yarra Bay and Clovelly Catchments' (BMT, 2018).



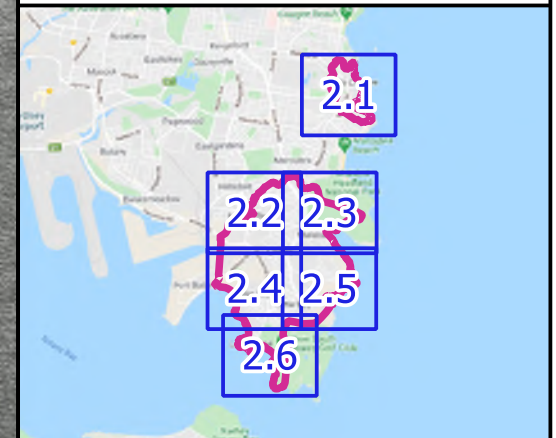
Scale: 1:7000 (at A3)  
0 80 160 240 320 m

**Figure 2.2:  
Existing Datasets**

Prepared by:  
**Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Existing Datasets.qgz  
Using Layout: Figure 2.2

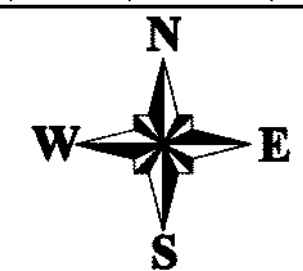




### LEGEND

- Structures**
- Stormwater Pipe/Culvert
  - Stormwater Pit
  - GPT
- Topographic Data**
- 2005 ALS/2013 LIDAR
  - 2020 LIDAR
- Preliminary Flood Extents**
- 1%AEP
  - PMF
  - Critical/Vulnerable Facility

Notes:  
Aerial photograph: Google Satellite 2019.  
Preliminary flood extents extracted from 'Simplified Flood Modelling for Lurline Bay, Matraville, Malabar, Yarra Bay and Clovelly Catchments' (BMT, 2018).



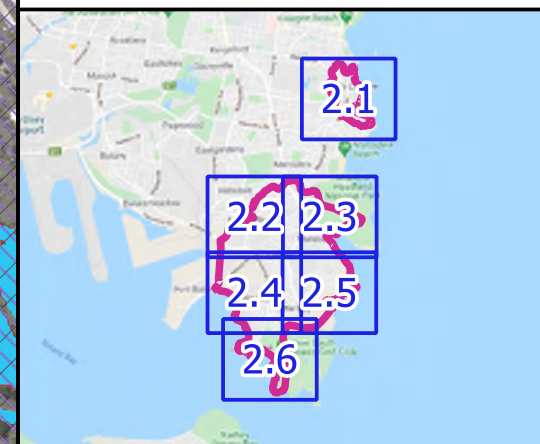
Scale: 1:7000 (at A3)  
0 80 160 240 320 m

**Figure 2.3:  
Existing Datasets**

Prepared by:  
**Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Existing Datasets.qgz  
Using Layout: Figure 2.3

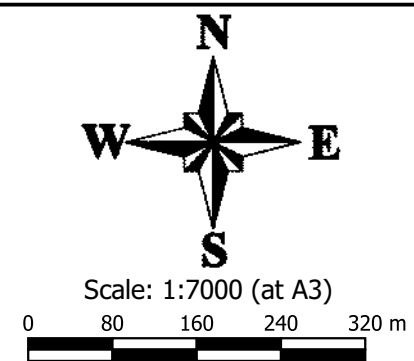




## LEGEND

- Structures**
- Stormwater Pipe/Culvert
  - Stormwater Pit
  - GPT
- Topographic Data**
- 2005 ALS/2013 LIDAR
  - 2020 LIDAR
- Preliminary Flood Extents**
- 1%AEP
  - PMF
  - Critical/Vulnerable Facility

Notes:  
Aerial photograph: Google Satellite 2019.  
Preliminary flood extents extracted from 'Simplified Flood Modelling for Lurline Bay, Matraville, Malabar, Yarra Bay and Clovelly Catchments' (BMT, 2018).

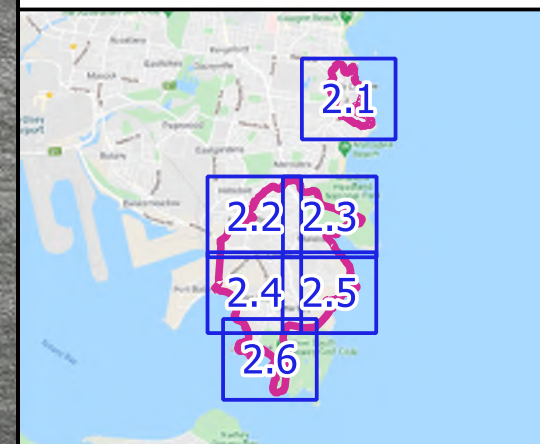


**Figure 2.4:  
Existing Datasets**

Prepared by:  
**Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Existing Datasets.qgz  
Using Layout: Figure 2.4





## LEGEND

### Structures

- Stormwater Pipe/Culvert
- Stormwater Pit
- GPT

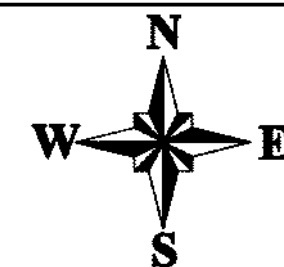
### Topographic Data

- 2005 ALS/2013 LiDAR
- 2020 LiDAR

### Preliminary Flood Extents


- 1%AEP
- PMF
- Critical/Vulnerable Facility

Notes:  
Aerial photograph: Google Satellite 2019.  
Preliminary flood extents extracted from 'Simplified Flood Modelling for Lurline Bay, Matraville, Malabar, Yarra Bay and Clovelly Catchments' (BMT, 2018).



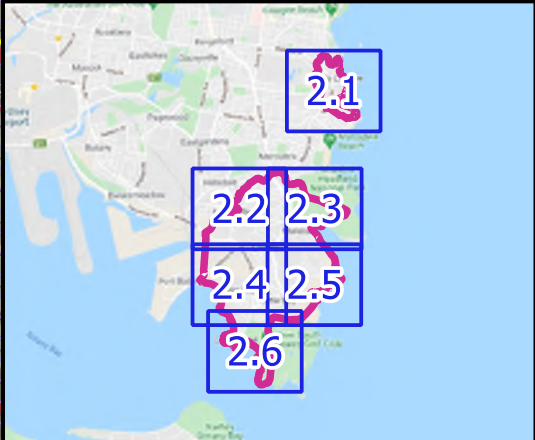
Scale: 1:7000 (at A3)  
0 80 160 240 320 m

**Figure 2.5:  
Existing Datasets**

Prepared by:  
 **Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Existing Datasets.qgz  
Using Layout: Figure 2.5

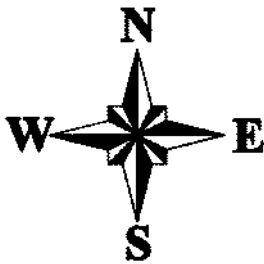




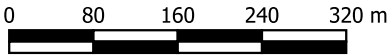
**LEGEND**

- Structures**
- Stormwater Pipe/Culvert
  - Stormwater Pit
  - GPT
- Topographic Data**
- 2005 ALS/2013 LIDAR
  - 2020 LIDAR
- Preliminary Flood Extents**
- 1%AEP
  - PMF
  - Critical/Vulnerable Facility

Notes:  
Aerial photograph: Google Satellite 2019.  
Preliminary flood extents extracted from 'Simplified Flood Modelling for Lurline Bay, Matraville, Malabar, Yarra Bay and Clovelly Catchments' (BMT, 2018).



Scale: 1:7000 (at A3)

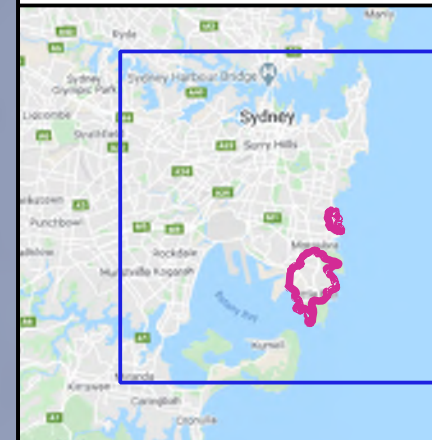
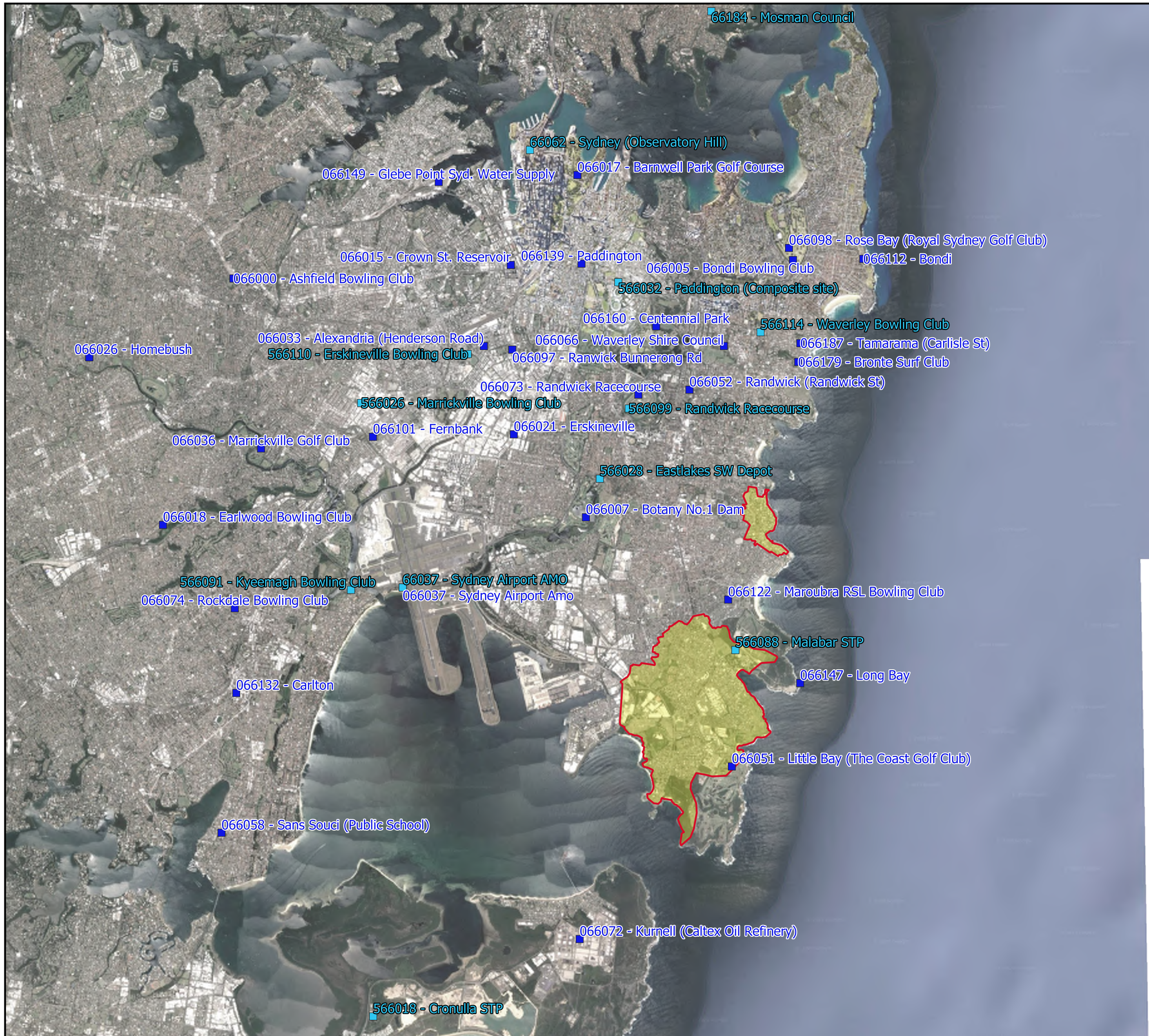


**Figure 2.6:  
Existing Datasets**

Prepared by:  
**Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Existing Datasets.qgz  
Using Layout: Figure 2.6

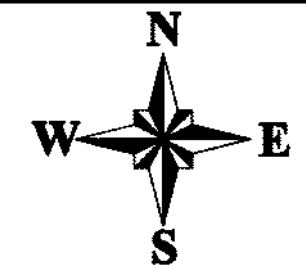




### LEGEND

- Study Area
- Rain Gauges
  - Continuous
  - Daily

Notes:  
Aerial photograph: Google Satellite 2019



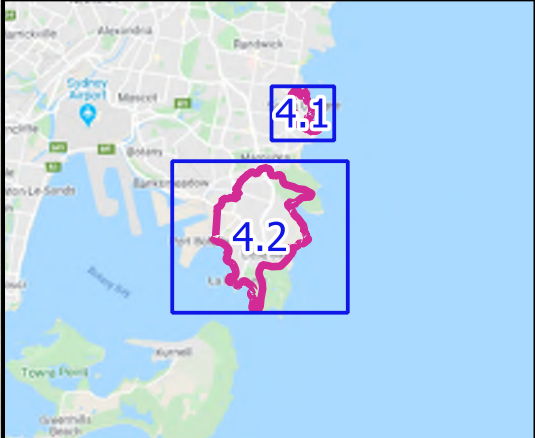
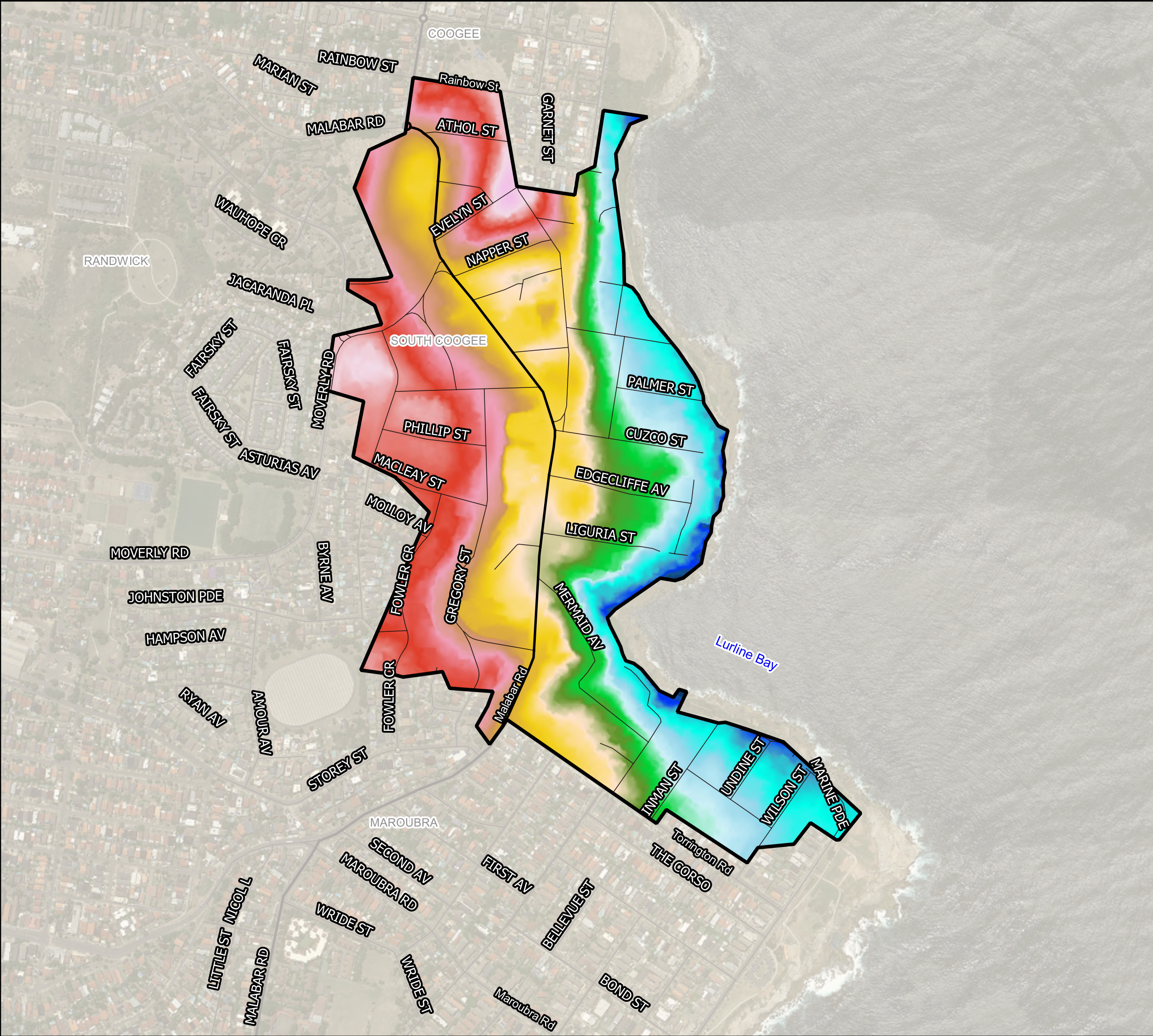
Scale: 1:81000 (at A3)  
0 1000 2000 3000 4000 m

**Figure 3:**  
**Location of Rainfall Gauges**

Prepared by:  
**Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Location of Rainfall Gauges.qgz  
Using Layout: Figure 3



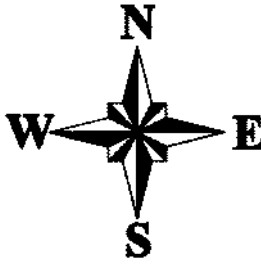


**LEGEND**

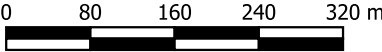
Ground Surface Elevation (mAHD)

= <0	45
5	50
10	55
15	60
20	65
25	70
30	80
35	90
40	>=100


Notes:  
Aerial photograph: Google Satellite 2019



Scale: 1:7000 (at A3)

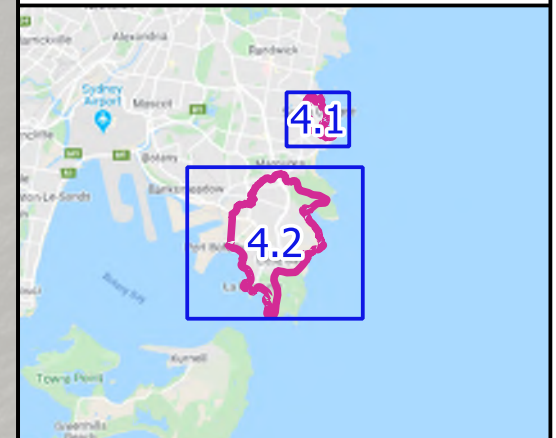
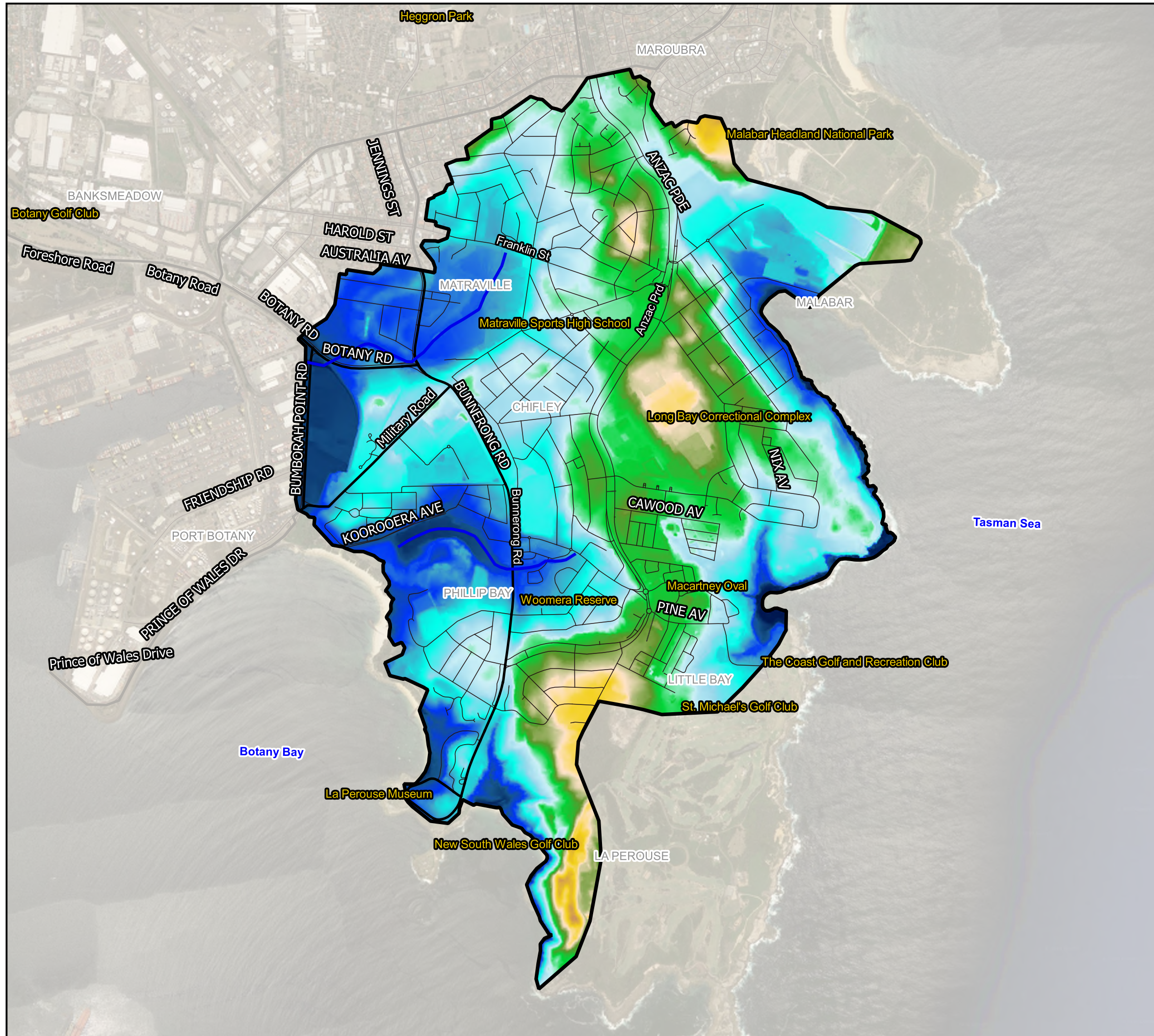


**Figure 4.1:**  
**Digital Elevation Model for**  
**the Lurline Bay Catchment**

Prepared by:  
 **Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Digital Elevation Model for the Lurline Bay  
Catchment.qgz  
Using Layout: Figure 4.1



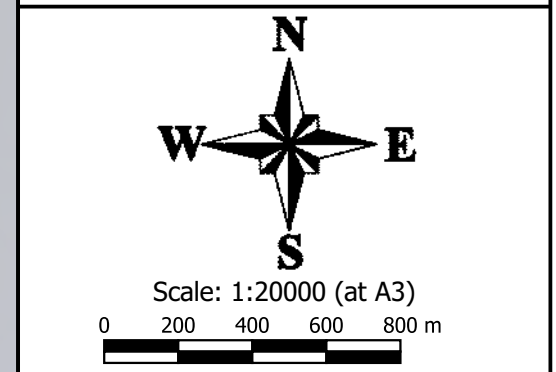


**LEGEND**


Ground Surface Elevation (mAHD)

=<0	45
5	50
10	55
15	60
20	65
25	70
30	80
35	90
40	>=100

Notes:  
Aerial photograph: Google Satellite 2019

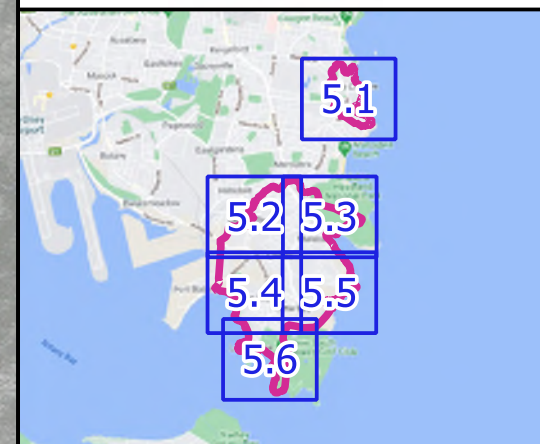


**Figure 4.2:**  
**Digital Elevation Model for**  
**the Lurline Bay Catchment**

Prepared by:  
 **Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Digital Elevation Model for the Lurline Bay  
Catchment.qgz  
Using Layout: Figure 4.2

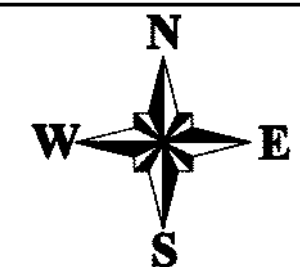




### LEGEND


- Study Area Boundary
- Material**
- Building
- Cleared Watercourse
- Tree
- Grass
- Road
- Concrete
- Sand
- Area Under Construction
- Crops
- Cemetery
- Rock
- Gravel Road
- Vegetated Watercourse

Notes:  
Aerial photograph: Google Satellite 2019



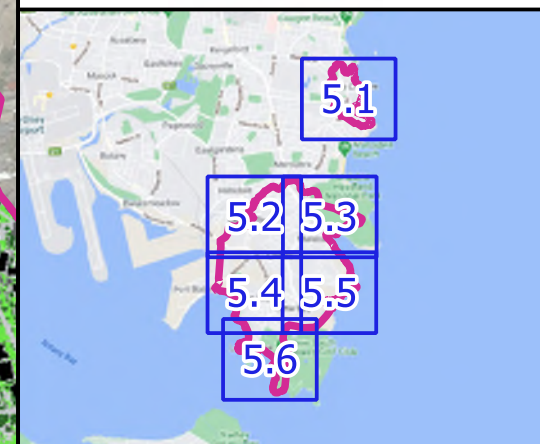
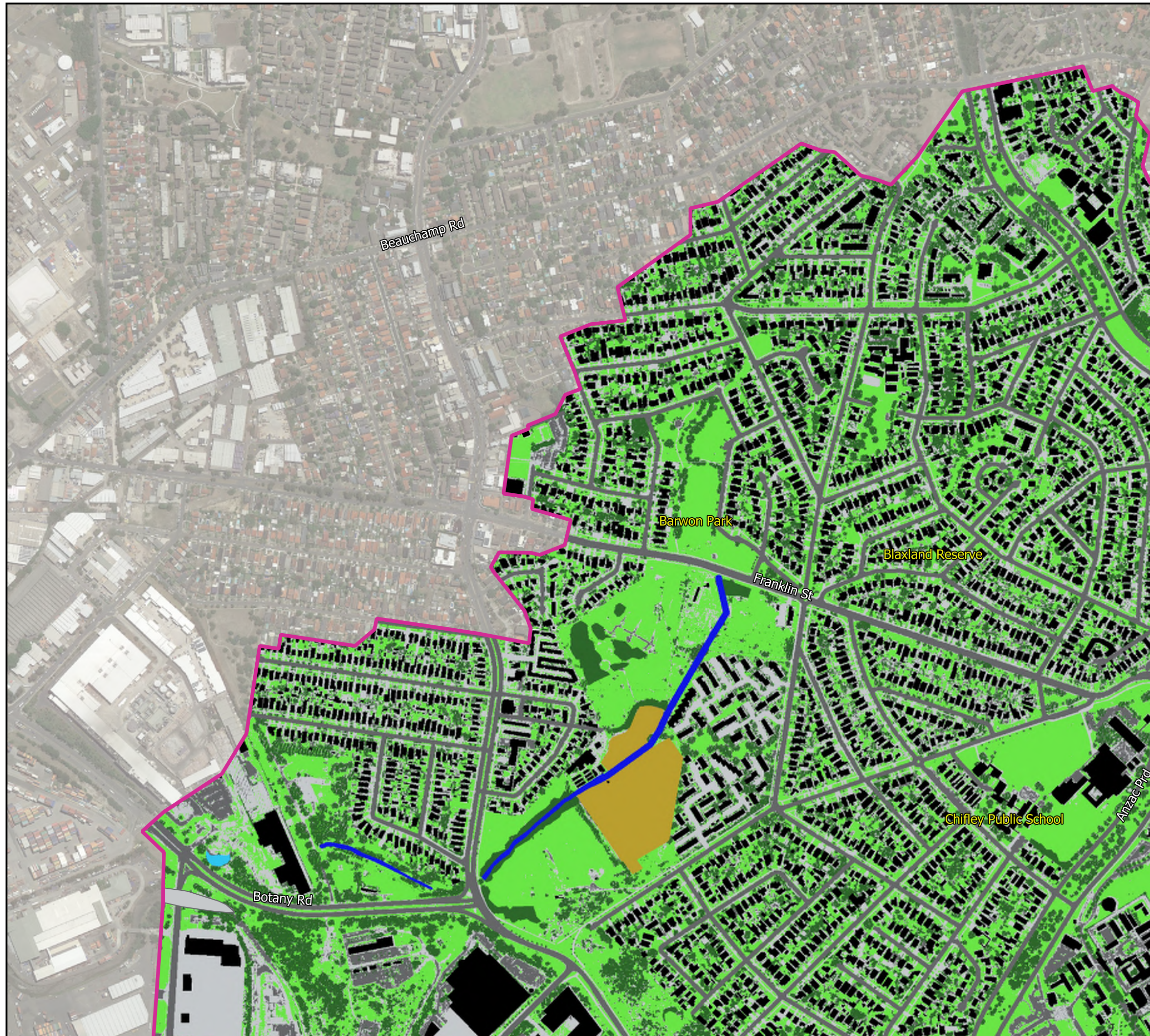
Scale: 1:7000 (at A3)  
0 80 160 240 320 m

**Figure 5.1:**  
**Remote Sensing Land Use**  
**Map for Lurline Bay**

Prepared by:  
 **Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Remote Sensing Land Use Map for Lurline Bay.qgz  
Using Layout: Figure 5.1

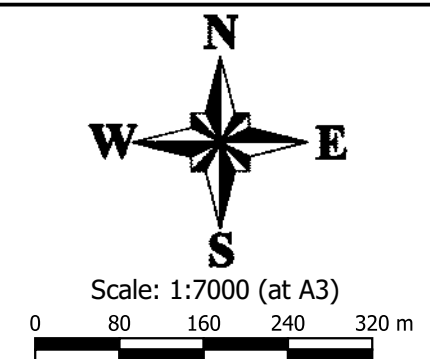




### LEGEND

- Study Area Boundary
- Material**
  - Building
  - Cleared Watercourse
  - Tree
  - Grass
  - Road
  - Concrete
  - Sand
  - Area Under Construction
  - Crops
  - Cemetery
  - Rock
  - Gravel Road
  - Vegetated Watercourse

Notes:  
Aerial photograph: Google Satellite 2019

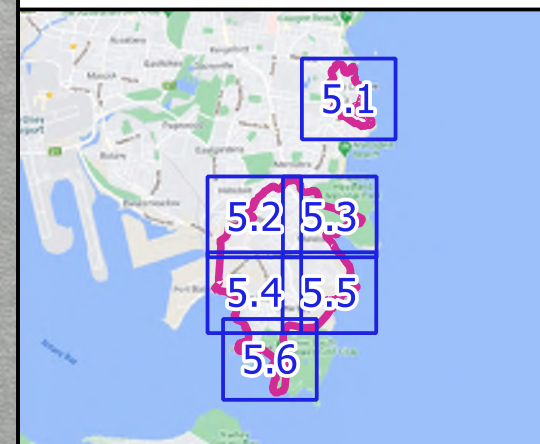


**Figure 5.2:**  
**Remote Sensing Land Use**  
**Map for Lurline Bay**

Prepared by:  
**Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Remote Sensing Land Use Map for Lurline Bay.qgz  
Using Layout: Figure 5.2

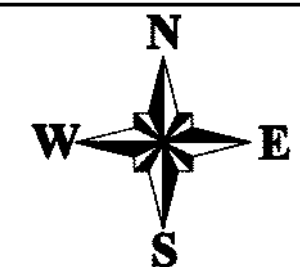




### LEGEND


- Study Area Boundary
- Material**
- Building
  - Cleared Watercourse
  - Tree
  - Grass
  - Road
  - Concrete
  - Sand
  - Area Under Construction
  - Crops
  - Cemetery
  - Rock
  - Gravel Road
  - Vegetated Watercourse

Notes:  
Aerial photograph: Google Satellite 2019



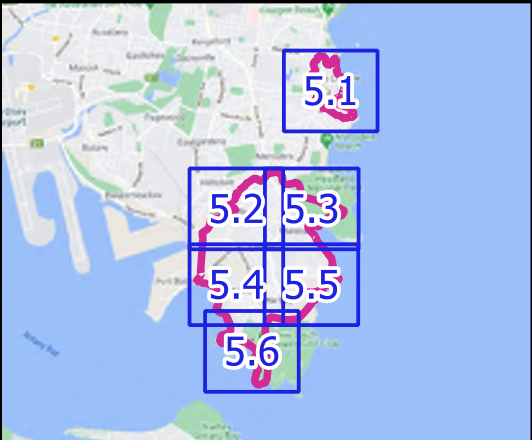
Scale: 1:7000 (at A3)  
0 80 160 240 320 m

**Figure 5.3:**  
**Remote Sensing Land Use**  
**Map for Lurline Bay**

Prepared by:  
 **Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Remote Sensing Land Use Map for Lurline Bay.qgz  
Using Layout: Figure 5.3

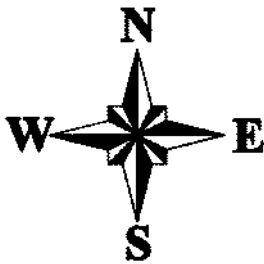




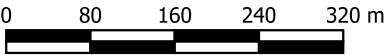
**LEGEND**

- Study Area Boundary
- Material**
- Building
  - Cleared Watercourse
  - Tree
  - Grass
  - Road
  - Concrete
  - Sand
  - Area Under Construction
  - Crops
  - Cemetery
  - Rock
  - Gravel Road
  - Vegetated Watercourse

Notes:  
Aerial photograph: Google Satellite 2019



Scale: 1:7000 (at A3)

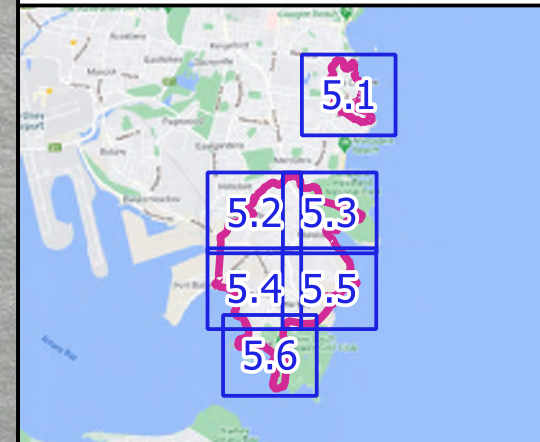


**Figure 5.4:**  
**Remote Sensing Land Use**  
**Map for Lurline Bay**

Prepared by:  
**Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Remote Sensing Land Use Map for Lurline Bay.qgz  
Using Layout: Figure 5.4





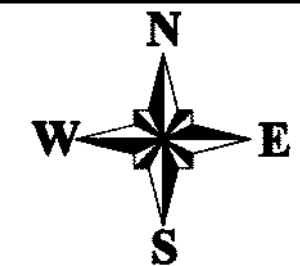
### LEGEND

Study Area Boundary

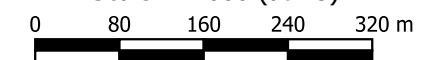
#### Material

- Building
- Cleared Watercourse
- Tree
- Grass
- Road
- Concrete
- Sand
- Area Under Construction
- Crops
- Cemetery
- Rock
- Gravel Road
- Vegetated Watercourse

Notes:  
Aerial photograph: Google Satellite 2019

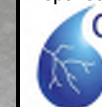


Scale: 1:7000 (at A3)



**Figure 5.5:**  
**Remote Sensing Land Use**  
**Map for Lurline Bay**

Prepared by:

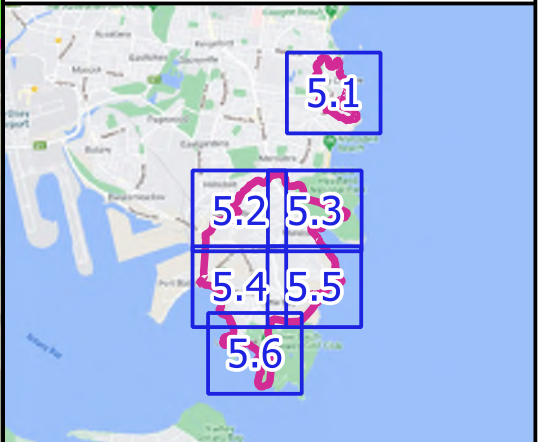


**Catchment Simulation Solutions**

Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Remote Sensing Land Use Map for Lurline Bay.qgz  
Using Layout: Figure 5.5





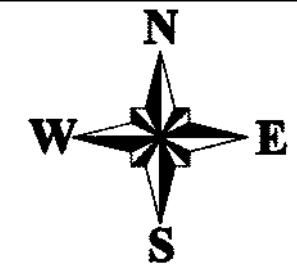
### LEGEND

Study Area Boundary

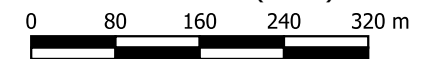
#### Material

- Building
- Cleared Watercourse
- Tree
- Grass
- Road
- Concrete
- Sand
- Area Under Construction
- Crops
- Cemetery
- Rock
- Gravel Road
- Vegetated Watercourse

Notes:  
Aerial photograph: Google Satellite 2019



Scale: 1:7000 (at A3)

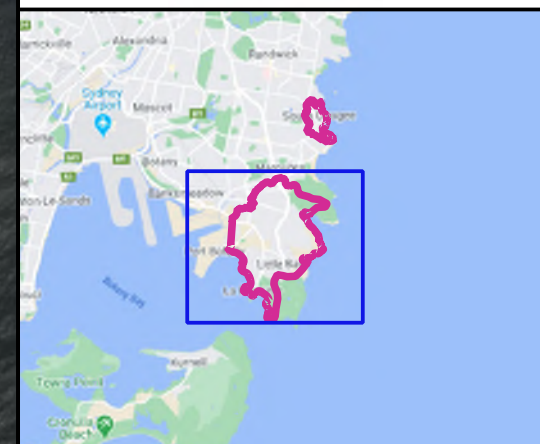


**Figure 5.6:**  
**Remote Sensing Land Use**  
**Map for Lurline Bay**

Prepared by:  
**Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Remote Sensing Land Use Map for Lurline Bay.qgz  
Using Layout: Figure 5.6





### LEGEND


- Surveyed Structure
- Surveyed Cross Section
- Stormwater Assets Reviewed by Council
- Existing Waterways

Notes:  
Aerial photograph: Google Satellite 2019



Scale: 1:20000 (at A3)  
0 200 400 600 800 m

**Figure 6:  
Additional Data Collected for  
Study**

Prepared by:  
 **Catchment Simulation Solutions**  
Suite 1, Level 10, 70 Phillip St  
Sydney, NSW, 2000

File Name: Additional Data Collected for Study.qgz  
Using Layout: Figure 6