

## 31 Ongare North

### 31.1 Site description

The Ongare North shoreline is located between Ongare and Tuapiro Point at the northern end of Tauranga Harbour. The site consists of approximately 1 km of consolidated cliff. The site is split into 4 cells based on differences in exposure and shoreline elevation (Figure 31-1).



Figure 31-1 Location and cell extent of the Ongare North shoreline within Tauranga Harbour.

The southern extent of the shoreline consists of well-vegetated cliff ranging in elevation from RL 6 to 10 m (Cell 31A). Towards north the cliffs increase in elevation to approximately RL 20 m (Cell 31B). The cliffs within Cell 31B face east and are exposed to an average fetch of 1.5 km. Most of the shoreline is well-vegetated with a sandy high-tide beach along the toe (Figure 31-2B). However at the southern end of Cell 31B there is evidence of a large slip (Figure 31-2A). Further north the cliffs wrap around to a northeast orientation and are elevated approximately RL 10 m (Cell 31C). The cliff toe within Cell 31C is less than 50 m from the tidal channel. The cliffs within Cell 31D are also elevated approximately RL 10 m, however they face north and are fronted by shallow intertidal flats.

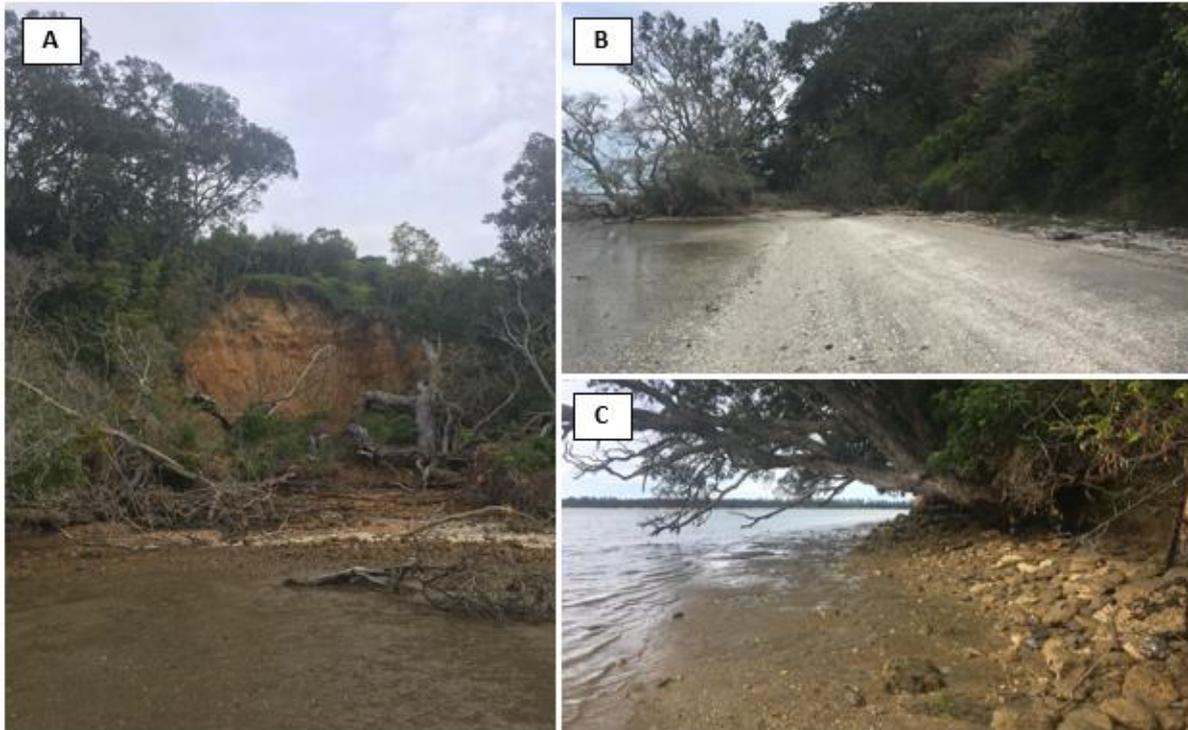


Figure 31-2 Site photos for Ongare North. (A) Large slip within Cell 31B. (B) High tide beach along the cliff toe (Cell 31B), (C) consolidated shoreline (Cell 31C).

### 31.2 Geology

The geological map of the area<sup>32</sup> indicates that the site comprises:

- Matua Subgroup: Poorly to moderately sorted gravel with minor sand and silt underlying terraces; includes minor fan deposits and loess.

Field observations of cliff exposures are in line with the published geology.

The existing slope angles in this area are between 30° to 40°. The range of stable slope angles for Ongare North are shown in Table 31-1 below.

The failure types observed around Ongare were typically shallow surface failures. The likelihood of deep seated movement is low.

### 31.3 Coastal processes

The Ongare North shoreline is exposed to fetches from the north around to the east. Tree coverage makes it difficult to determine the long term erosion rates within Cell 31A, however based on regression analysis within Cell 31B the long term erosion rate is estimated to range from -0.02 to -0.1 m/yr. The sandy high tide beach is likely to reduce wave energy reaching the cliff toe, however field observations indicate there are sections where waves have undercut the cliff toe during storm events. The tidal channel runs close to the shoreline within Cell 31C and based on the orientation of the shoreline is slightly more exposed than cells 31A and 31B. Based on regression analysis within Cell 31D the long term erosion rate is estimated to range from -0.05 to -0.15 m/yr.

<sup>32</sup> Edbrooke, S.W. (compiler) 2001: *Geology of the Auckland area*. Institute of Geological & Nuclear Sciences 1:250,000 geological map 3. 1 sheet + 74 p. Lower Hutt, New Zealand. Institute of Geological & Nuclear Sciences Limited.

Based on the fetch exposure the SLR response factor for all of the Ongare North shoreline is estimated to range from 0.1 to 0.3.

#### **31.4 Adopted component values**

Adopted component values are presented within Table 31-1. The short term values are equal to zero for the consolidated cells as short term erosion is not applicable for consolidated shorelines (see section 4.6.2 in main report).

**Table 31-1 Component values for cells along Ongare North.**

| Site   |      | 31. Ongare North |                |                |                |
|--|------|------------------|----------------|----------------|----------------|
| Cell   |      | 31A              | 31B            | 31C            | 31D            |
| Cell centre (NZTM)                                   | E    | 1862368          | 1862328        | 1862305        | 1862077        |
|  | N    | 5845647          | 5845862        | 5846051        | 5845970        |
| Morphology   |      | Consolidated     | Consolidated   | Consolidated   | Consolidated   |
| Geology  |      | Matua Subgroup   | Matua Subgroup | Matua Subgroup | Matua Subgroup |
| Exposure (average fetch/direction)                   |      | 1.5 km (NE)      | 1.5 km (NE)    | 2.5 km (NE)    | 5 km (N)       |
| State  |      | Natural          | Natural        | Natural        | Natural        |
| Short-term (m)                                       | Min  | 0                | 0              | 0              | 0              |
|  | Mode | 0                | 0              | 0              | 0              |
|  | Max  | 0                | 0              | 0              | 0              |
| Dune/Cliff elevation (m above toe or scarp)          | Min  | 6                | 19             | 8              | 7              |
|  | Mode | 7                | 20             | 9              | 10             |
|  | Max  | 10               | 21             | 11             | 12             |
| Stable angle (deg)                                   | Min  | 24               | 24             | 24             | 24             |
|  | Mode | 26               | 26             | 26             | 26             |
|  | Max  | 50               | 50             | 50             | 50             |
| Long-term (m)  | Min  | -0.1             | -0.1           | -0.2           | -0.15          |
|  | Mode | -0.05            | -0.05          | -0.15          | -0.1           |
|  | Max  | -0.02            | -0.02          | -0.1           | -0.05          |
| Closure slope (beaches)/SLR response factor (cliffs) | Min  | 0.1              | 0.1            | 0.1            | 0.1            |
|  | Mode | 0.2              | 0.2            | 0.2            | 0.2            |
|  | Max  | 0.3              | 0.3            | 0.3            | 0.3            |

### 31.5 Coastal erosion hazard assessment

Coastal erosion hazard distances for Ongare North are presented within Table 31-2 and an overview map in Figure 31-4. Histograms of individual components and resultant erosion hazard distances using a Monte Carlo technique are shown in Appendix B. For the purpose of this assessment all coastal erosion protection structures have been ignored (refer to main report Section 4.5.4).

The current P<sub>66%</sub> erosion hazard ranges from -11 m along the lower cliffs in Cell 31A to -27 m along the higher cliffs in Cell 31B. The future erosion hazard is also highest within Cell 31B due to the greater exposure to coastal processes. The future P<sub>5%</sub> erosion hazard for 1.6 m SLR in 2130 ranges from -28 m to -52 m.

**Table 31-2 Coastal erosion hazard widths for current, 2080 and 2130 timeframes.**

| Site         | Cell         | Timeframe    | SLR (m)     | Probability of Exceedance |                  |                  |                 |                 |     |     |
|--------------|--------------|--------------|-------------|---------------------------|------------------|------------------|-----------------|-----------------|-----|-----|
|              |              |              |             | Min                       | P <sub>66%</sub> | P <sub>50%</sub> | P <sub>5%</sub> | P <sub>1%</sub> | Max |     |
| Ongare North | 31A          | Current      | 0.03        | -6                        | -11              | -12              | -17             | -19             | -22 |     |
|              |              | 50yr (2080)  | 0.12        | -7                        | -14              | -15              | -20             | -23             | -26 |     |
|              |              |              | 0.2         | -8                        | -14              | -15              | -21             | -23             | -27 |     |
|              |              |              | 0.4         | -8                        | -15              | -16              | -22             | -24             | -28 |     |
|              |              |              | 0.6         | -8                        | -15              | -16              | -22             | -25             | -29 |     |
|              |              |              | 1.6         | -10                       | -19              | -21              | -28             | -31             | -37 |     |
|              |              | 100yr (2130) | 0.22        | -9                        | -16              | -18              | -24             | -27             | -31 |     |
|              |              |              | 0.6         | -9                        | -18              | -19              | -26             | -28             | -34 |     |
|              |              |              | 0.8         | -10                       | -18              | -20              | -26             | -29             | -35 |     |
|              |              |              | 1.25        | -10                       | -19              | -21              | -28             | -30             | -36 |     |
|              |              |              | 1.6         | -10                       | -19              | -21              | -28             | -31             | -37 |     |
|              |              | 31B          | Current     | 0.03                      | -17              | -27              | -30             | -42             | -44 | -46 |
|              |              |              | 50yr (2080) | 0.12                      | -19              | -30              | -33             | -45             | -47 | -51 |
|              |              |              |             | 0.2                       | -19              | -30              | -33             | -45             | -48 | -51 |
|              |              |              |             | 0.4                       | -19              | -31              | -34             | -46             | -49 | -53 |
|              | 0.6          |              |             | -19                       | -31              | -34              | -47             | -49             | -53 |     |
|              | 1.6          |              |             | -21                       | -36              | -39              | -52             | -55             | -62 |     |
|              | 100yr (2130) |              | 0.22        | -20                       | -32              | -36              | -48             | -51             | -55 |     |
|              |              |              | 0.6         | -21                       | -34              | -37              | -50             | -53             | -58 |     |
|              |              |              | 0.8         | -21                       | -34              | -38              | -50             | -54             | -59 |     |
|              |              |              | 1.25        | -21                       | -35              | -39              | -51             | -55             | -61 |     |
|              |              |              | 1.6         | -21                       | -36              | -39              | -52             | -55             | -62 |     |
|              | 31C          |              | Current     | 0.03                      | -8               | -14              | -15             | -21             | -23 | -25 |
|              |              |              | 50yr (2080) | 0.12                      | -12              | -19              | -20             | -26             | -28 | -31 |
|              |              |              |             | 0.2                       | -12              | -19              | -21             | -27             | -29 | -32 |
|              |              |              |             | 0.4                       | -13              | -20              | -22             | -29             | -31 | -33 |
|              |              | 0.6          |             | -13                       | -21              | -23              | -29             | -32             | -35 |     |
|              |              | 0.8          |             | -16                       | -26              | -28              | -35             | -38             | -42 |     |
|              |              | 100yr (2130) | 0.22        | -14                       | -23              | -25              | -32             | -35             | -38 |     |
|              |              |              | 0.6         | -16                       | -26              | -28              | -35             | -38             | -42 |     |
| 0.8          |              |              | -16         | -27                       | -29              | -37              | -39             | -44             |     |     |

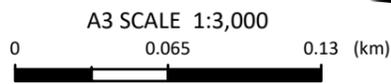
| Site | Cell                | Timeframe          | SLR (m)        | Probability of Exceedance |                  |                  |                 |                 |     |
|------|---------------------|--------------------|----------------|---------------------------|------------------|------------------|-----------------|-----------------|-----|
|      |                     |                    |                | Min                       | P <sub>66%</sub> | P <sub>50%</sub> | P <sub>5%</sub> | P <sub>1%</sub> | Max |
|      |                     |                    | 1.25           | -17                       | -28              | -30              | -38             | -41             | -46 |
|      |                     |                    | 1.6            | -17                       | -29              | -31              | -40             | -43             | -48 |
|      |                     |                    | <b>Current</b> | 0.03                      | -8               | -14              | -16             | -22             | -24 |
|      | <b>31D</b>          | <b>50yr (2080)</b> | 0.12           | -11                       | -19              | -21              | -28             | -30             | -35 |
|      |                     |                    | 0.2            | -11                       | -20              | -21              | -28             | -31             | -36 |
|      |                     |                    | 0.4            | -12                       | -21              | -22              | -30             | -32             | -37 |
|      |                     |                    | 0.6            | -12                       | -21              | -23              | -31             | -33             | -38 |
|      | <b>100yr (2130)</b> | 0.22               | -13            | -24                       | -26              | -33              | -36             | -41             |     |
|      |                     | 0.6                | -15            | -26                       | -28              | -37              | -40             | -45             |     |
|      |                     | 0.8                | -15            | -27                       | -29              | -38              | -41             | -47             |     |
|      |                     | 1.25               | -15            | -28                       | -31              | -39              | -43             | -49             |     |
|      |                     | 1.6                | -16            | -29                       | -31              | -41              | -44             | -51             |     |

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**Tonkin+Taylor**  
 105 Carlton Gore Rd, Newmarket, Auckland  
 www.tonkintaylor.co.nz

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**Tauranga Harbour Coastal Erosion Assessment**  
 Erosion Hazard Overview  
 Site 31: Ongare North

FIGURE No. Figure 31-4

Rev. 0