

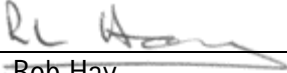
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DATE: 6 October 2009

PROJECT: Washdyke Industrial Zone Change  
Noise Assessment

REPORT NO.: 001 R01 2009400

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## 1.0 INTRODUCTION

Marshall Day Acoustics has been appointed to assess the potential noise effects that may arise from the proposed rezoning of land to the north of Washdyke, Timaru. The land is currently mainly paddocks in a mixture of titles under both Timaru District Council and private ownership. Within the Timaru District Plan the land is currently under a variety of zonings including Light and Heavy Industrial, Rural 1, 2 and 3 and Recreational 2. The proposed rezoning will place the bulk of the land into either Heavy or Light Industrial zones, with a small portion lying east of the 100 year coastal erosion zone remaining Rural 3.

The existing and proposed zone maps are provided in Appendix A.

This noise assessment report does not consider any specific activity for a particular site, but rather investigates the framework required to enable a range of different business activities within the area. For noise generated on specific sections within the overall site, the District Plan already provides a detailed system for noise assessment and control which is discussed in Section 3.0 of this report. In Section 4.0 we consider how the proposed zone could fit within this existing assessment system.

We understand that the proposal will also eventually generate additional traffic on the existing and proposed local road network. Section 5.0 considers noise from road traffic that may be generated as a result of the proposed business park.

## 2.0 EXISTING NOISE ENVIRONMENT

Marshall Day Acoustics conducted a site visit on 29 September 2009. We have also conducted numerous visits to other areas of Washdyke in the context of unrelated industrial and roading projects.

The southern boundary of the area to be rezoned is generally bordered by industrial land. This would result in a "like for like" and is of little concern from a noise perspective. The exception is the small parcel of Residential 1 zone bounded by State Highway 1, Seadown Road and land to the north owned by Rooney Holdings Limited.

To the east there is a narrow margin of land zoned Rural 3 within the 100 year coastal erosion line; existing Heavy Industrial and Rural 2 zoned land both owned by Timaru District Council. To the west, across the State Highway is the race track (zoned Recreation 2). Neither of these boundaries is considered to be noise sensitive.

To the north of the proposed zone change the land is Rural 1 and Rural 2 characterised by livestock rearing. The land zoned Rural 2 is under Council ownership, while the Rural 1 land is under private ownership. There are a limited number of dwellings in close proximity to the northern boundary of the zone change.

The dominant noise in the area is vehicle noise on the State Highway and on local roads. Industrial, and to a lesser extent rural activities, also contribute to the noise level. The nature of the noise source and the noise level depends on the exact locality. In general houses on the west and northwest of the Residential 1 area are in an environment characterised by relatively high levels of noise from the State Highway

with a lower level of noise from the existing commercial and industrial activities to the south, west, north and east. Houses to the east and northeast of the Residential zone are dominated by vehicle noise on Seadown Road. Although generally not as busy as the State Highway we noted that vehicle speeds, particularly north of Treglos Street, were generally higher. This resulted in greater noise levels than would have been otherwise expected.

Noise levels toward the southern tip of the Residential triangle were very high, receiving noise from both SH1 and Seadown Road along with industrial and commercial activity. As noted in Table 1 below the daytime noise level on boundaries facing SH1 was 75 dB  $L_{A10(18\text{ hour})}$ . Our calculations showed that the night-time noise level at the same location dropped to 62 dB  $L_{A10(6\text{ hour})}$ .

Noise at the rural land to the north of the proposed zone is generated by vehicles on SH1, Seadown, Meadows and Aorangi Roads. The Main South Rail line also runs through this area although the total noise contribution is not considered particularly significant except as a potential brief disturbance to sleep during the night-time.

Our noise measurements and their locations are summarised in Table 1 and Figure 1 below.

**Table 1**  
**Summary of noise measurements.**

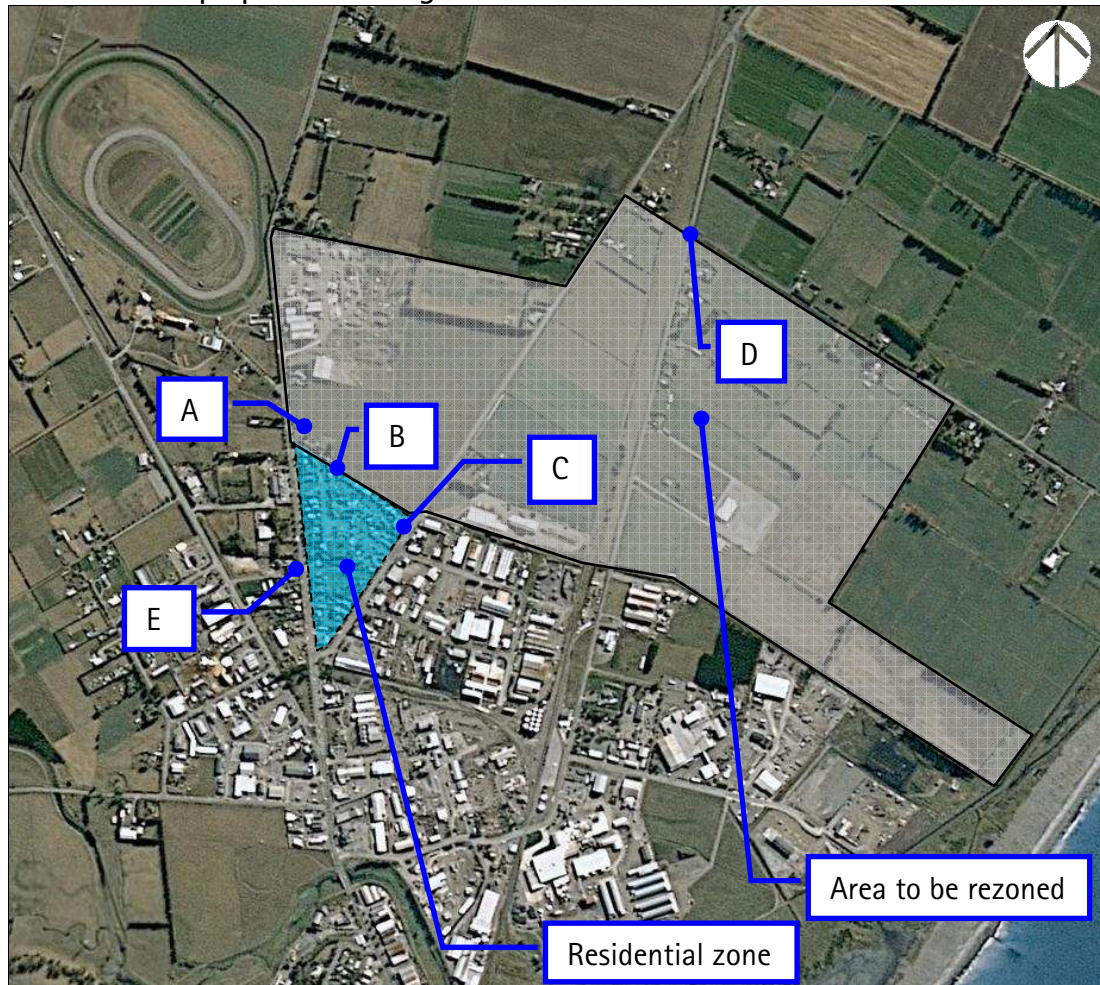
Location	Duration (mm:ss)	Description	dB $L_{A10}$	dB $L_{Aeq}$	dB $L_{AFmax}$
A	10:00	Dominated by SH1, occasional noise from Industrial site to the north	62	59	70
B	10:00	Dominated by SH1 with some contribution from Seadown Road	47	45	59
C	10:00	Dominated by Seadown Road, some distant SH1 and industrial activity noise	70	69	92
D	10:00	Dominated by traffic from Meadow onto Aorangi Road	64	62	81
E	169.75 hours	Dominated by SH1 some contribution from nearby commercial activities.	75	72	102

\*This value is obtained from a logger located at this site over a week in January 2007.  $L_{10} = L_{10(18\text{ hour})}$ ;  $L_{eq} = L_{eq(24\text{ hour})}$

The key details of the noise survey are as follows:

Date & time:	29 September 2009, 0900 – 1200.
Personnel:	Rob Hay, Marshall Day Acoustics
Weather:	5 – 10°C, overcast, nil wind.
Instrumentation:	Brüel & Kjær Type 2250 analyser, serial 2488377, calibration due 14/04/11 Brüel & Kjær Type 4231 calibrator, serial 2574264, calibration due 18/02/10
Calibration:	Field calibration of the equipment was carried out before measurements, and the calibration checked after measurements. No significant change ( $\leq \pm 0.1\text{dB}$ ) was noted.

Figure 1  
Aerial view of proposed rezoning and measurement locations.



### 3.0 TIMARU DISTRICT PLAN

The Timaru District Plan takes the somewhat unusual step of not specifying a noise limit within Residential Zones. Rather, zones which are considered to be likely producers of noise (for example Industrial or Rural Zones) have limits set on the level of noise they may emit into surrounding zones of greater sensitivity. Industrial zone noise rules are contained in Part D, Section 5.13 of the Plan, while Rural noise rules are given in Part D, Section 5.22. Those rules relevant for noise emissions from Industrial and Rural Zones to Residential Zones are summarised in Table 2 below. Refer to Appendix A for current and proposed extent of all zones.

Any activity that is lawfully established within the proposed Industrial Zone must meet the limits specified in the noise rules. As can be seen from Table 2, for households in the Residential Zone this would not result in any change to the potential level of noise to which they may be exposed by neighbouring activities when compared to that which is currently permitted.

A small number of existing rural households (around five) may potentially be exposed to noise levels of up to 5 dB greater than those to which they may be currently exposed as a result of a change to primarily industrial activity nearby (Table 2).

**Table 2**  
**Summary of applicable District Plan noise rules.**

Zone Producing Noise	Zone Receiving Noise					
	Residential 1 <sup>A</sup>			Rural 1 <sup>B</sup>		
	Daytime	Night-time		Daytime	Night-time	
	dB L <sub>A10</sub>	dB L <sub>A10</sub>	dB L <sub>AFmax</sub>	dB L <sub>A10</sub>	dB L <sub>A10</sub>	dB L <sub>AFmax</sub>
Rural	50	40	70	50	40	70
Industrial	50	40	70	55	45	75

*A Measured at or within the boundary of the receiving zone.*

*B Measured at the notional boundary of the nearest household.*

*Daytime is 0700 to 2200 hours on any day. Night-time is 2200 until 0700 the following day.*

Should further residential development occur to the north of the proposed industrial zone there will be increased potential for reverse sensitivity due to noise and presumably other effects.

Most of the households potentially affected by noise are those in the Residential 1 Zone. A small number of these households may argue that they have a rural boundary. However, in practice the ambient noise level during the daytime is already moderate to high (47 to 70 dB L<sub>A10</sub>), largely as a result of road noise. While road noise can be reasonably expected to reduce at night, this reduction will be less for houses on or close to SH 1 (at least half of those in the zone) as this highway carries significant numbers of heavy vehicles at night.

Indeed the current zone map is somewhat misleading as to the character of the area. The Rural 1 land to the immediate north has already been taken up in large part of transport and storage yards and buildings, a concrete batching plant and storage of old tyres and demolition waste. The land to the east is given over to varying industrial activities; while the southern tip of the Residential zoned triangle forming the intersection of SH1 and Seadown road has two commercial activities occupying the land. Similarly much of the Residential 1 and 4 zones to the west are in fact occupied by commercial activities. We are aware of only eight households on the west side of this stretch of SH1.

Given that the ambient noise levels measured around this zone we are of the view that if the proposed rezoning goes ahead there would be no increase in the existing noise level over that already being experience or indeed permitted for the current activities.

For Rural properties around Meadows and Aorangi Roads, there is certainly the potential for an increase in noise at some dwellings set well back from the road edge unless additional mitigation is considered.

The site survey and discussion above relate to daytime operation in the proposed industrial zone. Whilst the existing ambient noise levels will be lower at night, there

will also be less activity in the proposed industrial zone. The District Plan noise limits are also correspondingly lower at night.

On the basis of the existing noise environment we predict that the noise effects of activity in the proposed industrial zone would be no more than minor at neighbouring sites, as the standard noise control provisions of the District Plan provide appropriate protection.

#### 4.0 NOISE EMISSIONS

As shown in Appendix A, approximately half of the surrounding land adjacent to the proposed industrial zone, is in Rural or Residential Zones. As these zones have noise rules that are more stringent than at Industrial or Commercial Zone boundaries, special noise control measures will be required to achieve the District Plan noise limits. However, this situation is aided by the separation provided by the width of Aorangi and Seadown Roads at some boundaries.

As a guide, the following gives noise levels can typically be achieved from industrial sites with standard good noise control practice for all elements of an activity.

**Table 3**  
**Typical noise levels achieved by industrial sites.**

Industry	Examples	Noise level at boundary dB L <sub>A10</sub>
Light	Warehouse/storage facilities	55 – 60
Medium	Light workshop facilities, bulk retail	60 – 65
Heavy	Manufacturing, heavy engineering	70 – 75

It can be seen that medium and heavy industry are substantially noisier than the proposed boundary noise limits with Rural and Residential Zones. Industries expected in the Heavy Industrial Zones are described in Part D, Section 4.2.2 of the Plan. However, the proposed zoning is such that there is ample scope for locating noisy activities well away from residential and rural areas.

The proposed zoning is such that only Light Industrial activities as defined in Part D, Section 4.2.1 of the Plan are likely to be present in land adjoining the Residential Zone. For light industry the typical levels in the above table are 5-10 dB above the Residential daytime noise limit and 15-20 dB above the night-time limit. There are several options available when designing the activities on each individual section within the proposed zone to address this situation. The following are typical controls which would be required to allow light industrial activity adjacent to a boundary of a neighbouring Residential zone. In addition to these controls the industrial activities would require general good practice in noise control design.

Daytime operation only

- Either: 1) 50-100 m setback (including the width of roads or drainage easements); OR
- 2) Screening of all noise sources to remove line of sight to neighbours – typically 3-5 m high barrier/bunding. The screening could be provided by an industrial building itself with careful design.

24 hr operation

- Both: 1) 50-100 m setback; AND
- 2) Screening of all noise sources to remove line of sight to neighbours – typically 3-5 m high barrier/bunding

As noted above, these measures are only given for indicative purposes. Each activity should be individually assessed in due course, as a separate exercise to the rezoning application.

The choice of these options is a matter for the detailed design of the individual sections within the Zone and should not in our view form part of the application for rezoning. The important point is that practical methods do exist which allow the required noise limits to be achieved.

## 5.0 TRAFFIC NOISE

In common with all District Plans, the Timaru District Plan excludes traffic noise on roads from the noise rules. This exception accounts for both the fact that everyone uses roads as an essential part of life, and also that it would be difficult to enforce any limit where the noise producer could not be clearly identified (noise from roads is due to a large number of different vehicles). However, when assessing the effect of rezoning this substantial site, the potential increase in noise due to vehicles travelling to and from the site should be considered.

During our site visit we inspected vehicle routes between the site and the State Highway network. Other than the Rooney site, which has access directly to SH1, traffic leaving the proposed zone must use Aorangi, Meadows and Seadown Roads. Excluding households within the proposed zone we observed a small number of households on Seadown Road (in the vicinity of Aorangi Road), and one household a little further north on Meadow Road that may be exposed to this increased level of vehicle traffic. There are a further 14 households within the Residential Zone that face directly onto Seadown Road. While all of these roads currently receive some heavy traffic from existing industrial and farming activities this traffic is only of a frequent nature within the existing industrial area.

We understand that the proposed rezoning will result in additional traffic including a relatively high proportion of heavy commercial vehicles. This will cause a corresponding increase in traffic noise levels on Aorangi, Meadows and Seadown Roads. However, as the southern portions of Seadown and Meadows Roads already have significant heavy commercial vehicle traffic we do not consider that any increase in traffic noise will cause a more than minor noise effect.

Appendix B provides the currently proposed transportation linkages within the proposed zone. Based on this layout we expect that noise effects originating on these proposed new main and secondary roads will be largely internalised within the proposed industrial zone. In any case we believe that the cumulative noise effect, together with increased noise on the existing road network will be no more than minor at or within the boundary of surrounding zones.

We note that no transport linkages are currently indicated for the Rooney site. We assume that such linkages will be required to allow for the further development of the site. The location and layout of these new roads will need to be carefully designed to minimise noise effects on the northern boundary of the residential zone, and must be considered in the context of the nature of any proposed new activities.

## 6.0 CONCLUSIONS

Marshall Day Acoustics has assessed the potential noise effects associated with the proposed rezoning of land adjacent to the north of Washdyke, Timaru.

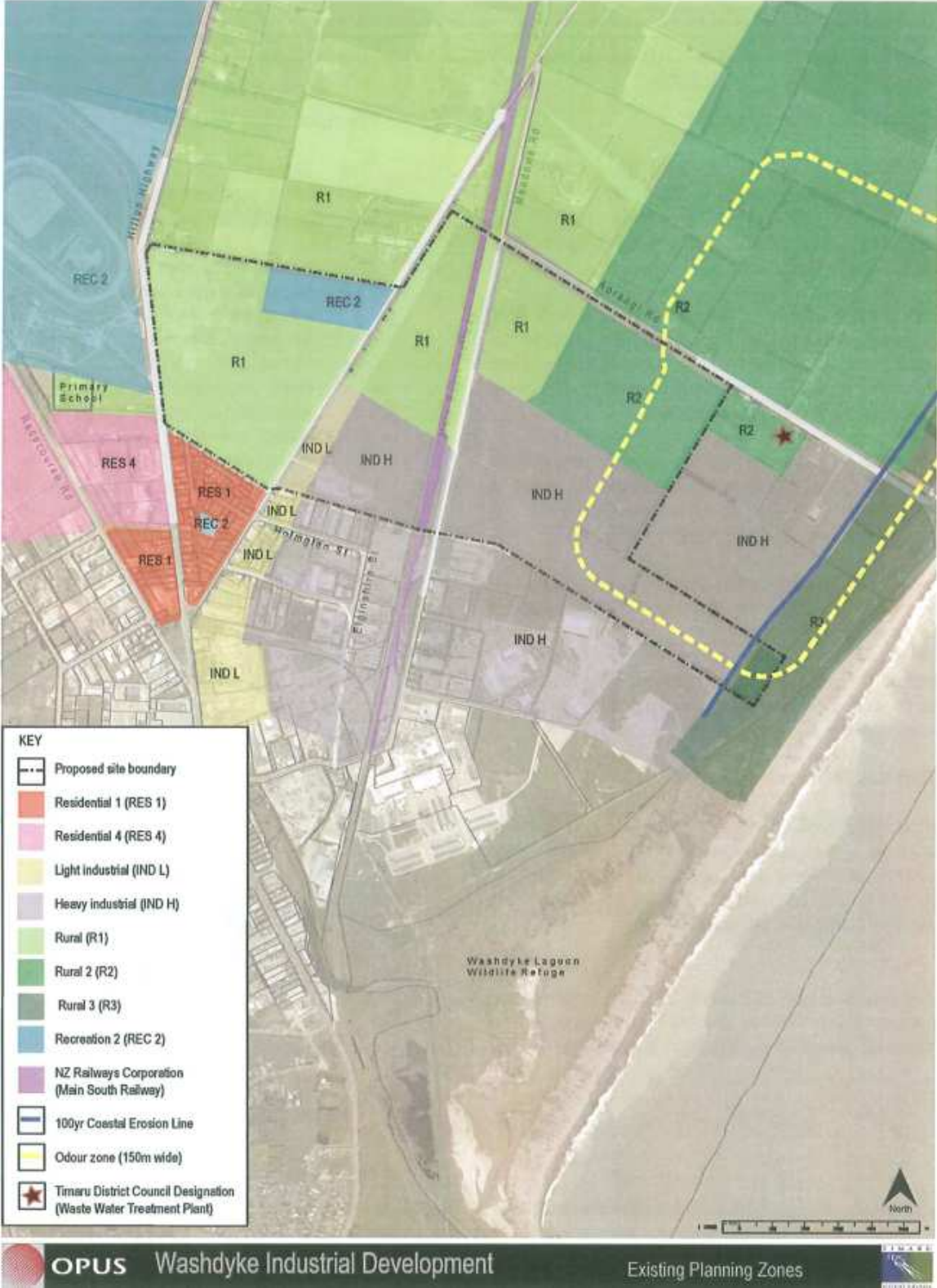
In respect to noise, much of the amenity of the area zoned Residential 1 has already been eroded by noise from SH1 and other major road networks. While our subjective impression was that industrial noise at the boundary with the Residential Zone was compliant, it is probable that vehicle noise masks industrial activity noise to some extent.

For industrial activity on individual sections within the business park it is concluded that the standard noise control provisions in the Timaru District Plan will ensure that the cumulative noise effects of industrial activities and increased activity on transport linkages are no more than minor.

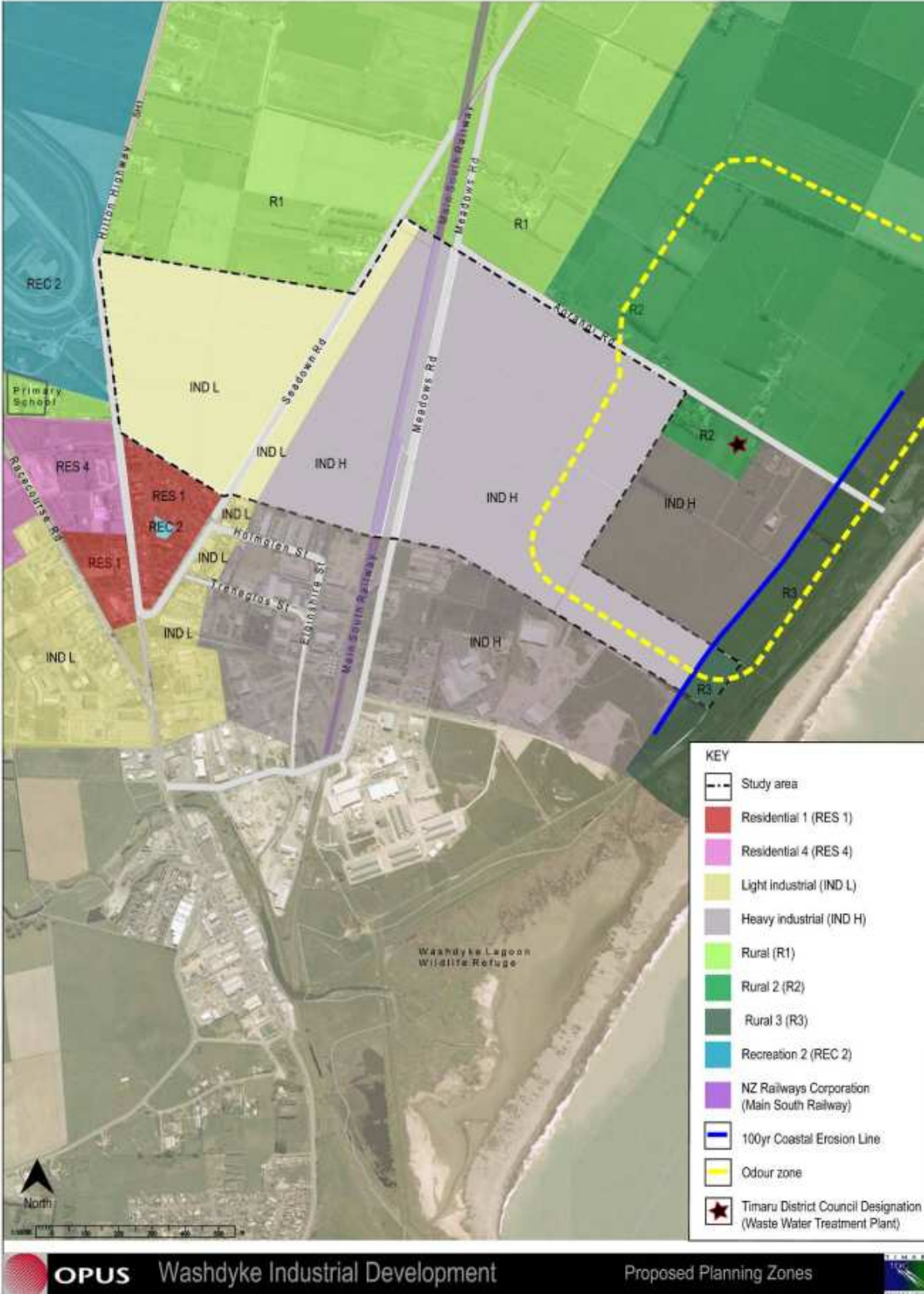
To comply with the District Plan noise rules, activities near boundaries of the proposed industrial zone with Residential 1 Zones will need special attention paid to noise control. This process should occur during the detailed design of specific activities on individual sections. Alternatively, where a larger area of land is to undergo conversion to a specific planned activity or activities, that entire area can be considered as for an individual site.

APPENDIX A EXTENT OF EXISTING AND PROPOSED ZONES

Existing Zoning



Proposed Zoning



APPENDIX B PROPOSED TRANSPORTATION LINKAGES



Proposed Transportation Linkages  
Washdyke Industrial Development