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**Transport Assessment**

**prepared for**

# WESTLAND MINERAL SANDS CO. LTD

**713 Ruatapu Road, Mananui**

**October 2023**

**Integrated Transport Assessment**

**prepared for**

# Westland Mineral Sands Co. Ltd

**713 Ruatapu Road, Mananui**

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| Document Date: | 04/10/2023 |
| Document Version/Status: | Revision C – Final |
| Project Reference: | 746-008 |
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| Reviewed by | Lisa Williams, Senior Transport Engineer and Planner |

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# Introduction

1. Westland Mineral Sands Co. Ltd has commissioned Novo Group to prepare a Transport Assessment (TA) for the development of a mineral extraction site at 713 Ruatapu Road in Mananui, on the West Coast.

2. This report provides an assessment of the transport aspects of the proposed development. It also describes the transport environment in the vicinity of the site, describes the transport related components of the proposal and identifies compliance issues with the transport provisions in the District Plan.

3. It is proposed to undertake mineral extraction and processing at the application site. The material will then be taken by truck for storage or export. Access will be taken from Ruatapu Road (State Highway 6). The site location is illustrated in **Figure 1** and a copy of the site plan is included in **Attachment 1**.


**Figure 1: Site Location**

4. The site is predicted to generate on average 70 truck movements per day (35 inbound plus 35 outbound). The peak hour traffic generation is predicted to be 48 vehicle movements per hour (including light vehicles) and the activity will generate 515 equivalent car movements per day.

# Transport Environment

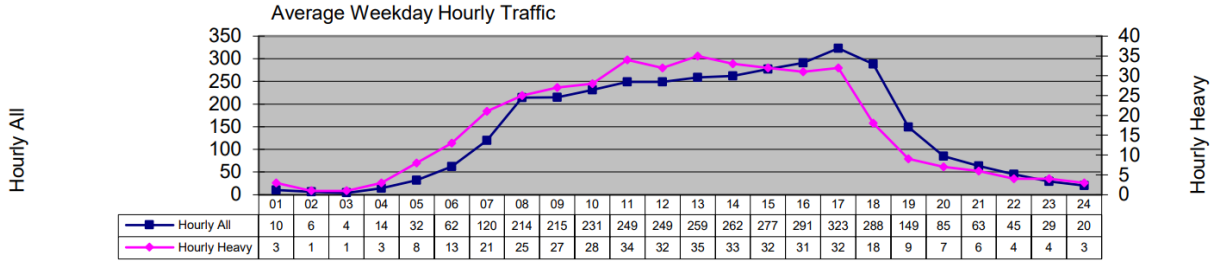
## Road Network

### Ruatapu Road (State Highway 6)

5. Ruatapu Road (SH6) is classified as *State Highway*. This road has a reasonably straight and flat alignment near the site. The road has a carriageway width of approximately 7.2m, plus 0.7m sealed shoulders and wide grass berms. **Figure 2** is photograph showing the typical form of Ruatapu Road in the vicinity of the existing site access.

**Figure 2: Ruatapu Road Looking North from the Site Access**

6. The existing annual average traffic volume on Ruatapu Road is approximately 2,625 vehicles per day (14% heavy traffic)[1]. The Chesterfield Telemetry site is the closest to the Application Site and the daily data set out in **Figure 3** (from that site) suggests the peak hour traffic volumes on SH6 are approximately 10% of the daily volume. This suggests the peak hour traffic on SH6 at the Application Site is 263 vehicles per hour and this occurs at 17:00.




| | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hourly All | 10 | 6 | 4 | 14 | 32 | 62 | 120 | 214 | 215 | 231 | 249 | 249 | 259 | 262 | 277 | 291 | 323 | 288 | 149 | 85 | 63 | 45 | 29 | 20 |
| Hourly Heavy | 3 | 1 | 1 | 3 | 8 | 13 | 21 | 25 | 27 | 28 | 34 | 32 | 35 | 33 | 32 | 31 | 32 | 18 | 9 | 7 | 6 | 4 | 4 | 3 |

**Figure 3: SH6 Chesterfield Telemetry Data**

[1] From the NZ Transport Agency State Highway traffic count spreadsheet 2015 – 2019.

7. The speed limit on SH6 at the site location is 100km/h and observed speeds during our site visit were consistent with this. The mean operating speed in Waka Kotahi's MegaMaps is also 98km/h on this segment of road.

8. SH6 is a Limited Access Road at this location. The site currently has two accesses to SH6, one at the existing dwelling and a second at the southern boundary.

**Crash History**

9. The NZ Transport Agency Crash Analyses System (CAS) has been reviewed to identify crashes that have been reported on Ruatapu Road along the site frontage during the most recent five-year period available (2018 to 2023). A Serious injury crash was reported at the access to 694 Ruatapu Road (near the northern end of the site and on the opposite side of the road). This crash occurred when a southbound Ambulance was overtaking a southbound vehicle in an emergency situation. The southbound vehicle turned right to enter the property and into the path of the overtaking Ambulance, leading to the crash.

10. The above crash is considered to be an isolated incident that does not identify a general concern regarding road safety at this location.

# The Proposal

11. It is proposed to develop the Site as a mine, with extraction of material anticipated to take ten years, although a 15-year consent term is sought to allow for contingencies, site establishment and remediation. The total gross floor area (GFA) of buildings and structures anticipated for the Processing Plant area is approximately 3,335m$^2$.

12. Plans of the proposed activity are included in **Appendix 1**.

13. The following sections set out the transport related components of the proposal.

## Traffic Generation

**Heavy Vehicles**

14. The export route for the extracted material is proposed to be north to the Port of Greymouth. The trucking of material is proposed to occur over 24 hours per day, although a peaking has been included in the hourly traffic volumes to allow for operational flexibility. The truck traffic generation has been based on the following assumptions:

    a. There will be a maximum output of 300,000 tonnes of material per year for transportation;

    b. Each truck would carry 30 tonnes of material, leading to 10,000 truck movements per year; and

    c. With 48 working weeks per year and a six-day week, there would be on average 35 truck loads per day, or 70 truck movements per day (35 departures plus 35 arrivals).

15. As set out above, is it proposed to undertake 24 hour trucking from the Site, although an allowance has been made for additional hourly truck movements to allow for operation flexibility. This leads to the following estimates of hourly truck movements:

    a. Average 24-Hour Truck Movements: Three to four truck movements per hour (two arrivals plus two departures); and

    b. Peak Truck Movements: Four to six truck movements per hour (three arrivals plus three departures).

16. There is also the potential that trucking is undertaken using High Productivity Motor Vehicles, which can accommodate 40 tonnes of material per load. This would reduce the heavy vehicle traffic generation set out above, which would reduce the potential transport effects of the proposed activity. However, the potential for reduced truck volumes is not relied upon in this assessment.

17. The equivalent car movement (ECM) generation from heavy vehicles[2] would be 350 ecms per day.

**Light Vehicles**

18. The traffic generation associated with light vehicles has been based on the following information:

    a. 13 staff work typical employment hours of 08:30 to 17:00[3];

    b. 30 staff work a day shift from 07:00 to 19:00; and

    c. 12 staff work a night shift from 19:00 to 07:00.

19. The peak traffic generation period would occur when shifts change, which would lead to 42 vehicle movements per hour at 07:00 and 19:00. This is on the basis that all staff drive to / from the site.

20. The daily traffic generation associated with the above is 110 vehicle movements per day (i.e. the staff arrive and depart the site once per day). This daily generation has been increased by 50% to account for off-site visitors, such as maintenance activities. Overall, the daily light vehicle traffic generation is assumed to be 165 vehicle movements per day. This is also 165 ecms per day[4].

**Traffic Generation Summary**

21. The above traffic generation data indicates the proposed activity is predicted to generate:

[2] 1 truck and trailer to and from the property = 10 equivalent car movements.
[3] This includes eight staff that are shared across other sites and are unlikely to be at the Mananui site at all times.
[4] 1 car to and from the property = 2 equivalent car movements.

a. A maximum of 48 vehicle movements per hour (six truck and trailer movements plus 42 light vehicle movements), occurring at 07:00 and 19:00;

b. A total of 235 vehicle movements per day (70 truck and trailer movements plus 165 light vehicle movements); and

c. A total of 515 ecms per day.

## Parking Demands

22. The site will include a variety of vehicles and machinery that will all be accommodated on-site. As with most mining projects, there will be sufficient metalled area on-site to accommodate all parking, storage and loading vehicle demands of the activity.

23. The maximum number of staff on site at any given time is anticipated to be 43, which occurs during the day when the 30 day-shift staff are on site as well as the 13 'typical employment' staff are on site. We note that the shift changes between day shift and night shift occurs outside of the 'typical employment' staff hours, so these do not need to be included in the calculation. Given this, the typical maximum car parking demand is estimated to be 43 light vehicles.

24. In addition to the staff, it has been estimated that the site may also attract a parking demand for visitors, such as maintenance staff and other ad hoc visitors. Given this, space for at least 45 light vehicles will be specifically accommodated within the site layout. These car parks will comply with the District Plan layout requirements.

## Access Arrangement

25. A single access is proposed (as identified on the plan in **Attachment 1**) and the existing southern access will be closed. The existing farm / dwelling access will be retained until such time as that portion of the Site is being mined.

26. The proposed access arrangement is illustrated in **Attachment 2** and **Figure 4**.

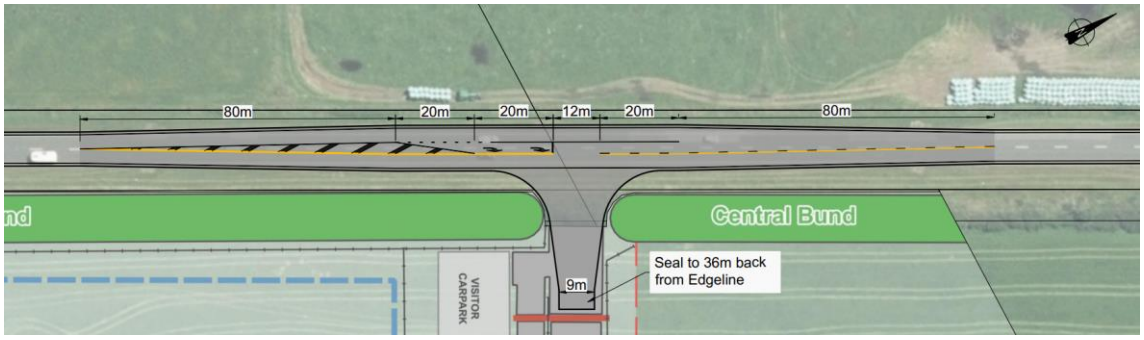



**Figure 4: Proposed Access Arrangement**

27. Following initial consultation with Waka Kotahi, the access arrangement has been designed as an intersection allowing for a design speed on SH6 of 110km/h. This includes the provision of a right turn bay, as per the consultation feedback.

28. The access arm approach to the intersection has been specifically designed to allow truck and trailers to pass each other at the access, as illustrated on the vehicle tracking in **Attachment 2**.

29. A sight distance of at least 282m is achieved in both directions from the access which meets the requirements of the NZTA Planning Policy Manual.

30. The access will be constructed early in the project life to assist in providing safe access for the construction of the mineral extraction plant.

## District Plan Compliance Assessment

31. The site is zoned *Rural* in the District Plan and the proposed activity is understood to be Discretionary. An assessment of compliance against the transport rules of the District Plan has been undertaken and is contained in **Appendix 3**. **Table 1** summarises the non-compliances identified.

**Table 1: District Plan Transport Non-Compliances**

| Rule | Nature of Non-Compliance |
|---|---|
| **8.9.2 Access to a State Highway** | The proposed activity will generate greater than 100 equivalent car movements (494 proposed).<br>Access is not in accordance with Figure 8.1(d)<br>The northern access does provides 178m separation to accesses on the opposite side of the road, where 200m is required. |

## Assessment of Effects

32. The Discretionary nature of the proposed activity means that all transport matters can be considered. The matters for assessment are considered to be:

    a. **Parking and Loading:** The provision of satisfactory on-site car parking and loading such that adverse effects on the road network are avoided;

    b. **Access Safety and Efficiency:** The provision of a satisfactory access such that it will operate safely and efficiently; and

    c. **Wider Network Effects:** The potential effects of the traffic generated by the proposed activity on the wider transport network.

33. These matters, as well as the non-compliances identified in **Table 1**, are assessed in turn in the following sections.

### Parking and Loading

#### Car Parking

34. The predicted parking demand at the activity has been set out in paragraph 23, which identified a demand for 38 car parking spaces. The proposed development includes car parking for at least 45 cars, so there is more than sufficient to meet the predicted parking

demands. There will be additional metalled areas within the site that can accommodate further car parking should the need arise, so no parking will occur on the frontage road (SH6).

35. The proposed car park layout has been designed in accordance with the District Plan. As such, the car park layout is considered to be acceptable.

### Loading

36. Loading of trucks will occur at the main plant location with a drive-through system. There is sufficient space provided to turn a truck at the exit of the loading area. This loading area is sufficiently far into the site such that any waiting loading vehicles will be able to wait on the internal road network without resulting in congestion. No vehicles are anticipated to park on-street.

37. Given the above, the loading provision is considered to be satisfactory.

## Site Access

### Access Safety

38. The first non-compliance identified regarding the proposed access arrangement is that it is not in accordance with Figure 8.1(d) of the District Plan. As set out at paragraph 28, the proposed access arrangement has been designed as an intersection as per initial feedback from Waka Kotahi. The access arrangement includes a right turn bay for traffic turning from SH6 and the access approach arm has been designed to allow an inbound truck and trailer to pass an outbound vehicle. Overall, the proposed access is considered to be superior to the District Plan requirement, which has road safety benefits to the State highway and is therefore considered to have positive effects.

39. The proposed gate is located well within the site and there is ample space to accommodate a truck arriving at the gate clear of the State highway. The access will also be sealed to the gate, giving approximately 36m of seal prior to the State highway. This sealed area will be swept on a regular basis to prevent material from being deposited on the road network.

40. A non-compliance was identified regarding the proximity of the proposed access to an access on the opposite side of the road. The access is on the opposite side of the road and is approximately 178m from the proposed access location. The widening required to accommodate the proposed access does not extend this far, so it does not affect this adjacent access. The available separation means there would be no conflict between movements for the proposed activity and those at the opposite access. There would also be no confusion as to which access is which given the low scale nature of the access opposite and the superior access arrangement proposed to the application site.

41. The straight and flat alignment of SH6 provides more than sufficient visibility for drivers to identify safe gaps to turn into / out of the site. The visibility will more than comply with the 210m required by the District Plan and achieves at least 282m as required by the NZTA's Planning Policy Manual.

42. Given the above, the access is anticipated to operate safely.

### Access Efficiency

43. The efficiency of the accesses has been considered against the requirements set out in Austroads. **Table 2** is an extract from a previous version of Austroads *Guide to Traffic Management, Part 3 – Traffic Studies*, which provides guidelines on the levels of traffic flow that can be accommodated by an intersection without requiring detailed analysis. Although no longer included in Austroads, we consider this table still forms a useful guide when considering the capacity of an access or intersection.

**Table 2: Intersection Volumes below which Capacity Analysis is Unnecessary (Extract of Austroads, Table 6.1)**

| Major Road Type | Major Road Traffic Volume (vph) (SH6) | Minor Road Traffic Volume (vph) (Site Access) |
|---|---|---|
| Two Lane | 400 | 250 |
| | 500 | 200 |
| | 650 | 100 |

44. The hourly traffic volume identified for SH6 in paragraph 6 was 263 vehicles per hour. The busiest site access (the southern access) is predicted to attract no more than 48 vehicle movements per hour. On this basis, the site access does not require detailed analysis because neither of these thresholds are greater than those set out in **Table 2**. As such, the site access is anticipated to operate without any efficiency concerns.

## Wider Network

45. To understand the effects of the proposed activity on the wider road network, the capacity of SH6 in the immediate vicinity of the site has been considered. Austroads Guide to Traffic Management, Part 3 – Traffic Studies also contains a calculation to determine the traffic capacity per lane per hour of roads[5]. SH6 in the vicinity of the application site is considered to have a capacity of 1,282 vehicles per hour per lane[6].

46. The traffic volumes on SH6 are currently approximately 263 vehicles per hour over two lanes and the proposed activity will increase this by 48 vehicle movements per hour (also over two lanes). These combined vehicle numbers are significantly less than the capacity of the road, so the transport effects on the wider network are considered to be acceptable.

[5] Refer to section *4.1.1 Capacity* of that document.
[6] Assuming fw = 0.8, PHV = 12% and EHV = 1.

# Summary and Conclusion

## Summary

47. It is proposed to undertake mineral extraction and processing at the application site. The material will then be taken by truck for storage or export. Access will be taken from Ruatapu Road (SH6). The site is predicted to generate 70 truck movements per day and 48 vehicle movements in the peak hour. The activity will generate an average of 515 ecms per day.

48. The application site will include more than sufficient internal parking and loading areas to accommodate the demand on-site. As such, no parking will occur on SH6.

49. The proposed access has been designed as an intersection (with a right turn bay) following initial feedback from Waka Kotahi. The access arm has also been designed to accommodate vehicles turning to / from the State highway without conflicting. This is considered to be a benefit to the safety and efficiency of SH6 and therefore acceptable. It is noted that the visibility at the access will more than comply with the District Plan and NZTA requirements. In addition, the traffic volumes on SH6 and generated by the activity remain well within acceptable volumes based on the anticipated capacity of the existing road design and the proposed access arrangements.

50. The effects of the proposed activity on the wider transport network have also been considered and there is more than sufficient capacity to accommodate the anticipated traffic generated by the proposal.

## Conclusion

51. Based on the above assessment, the proposed activity is considered to have acceptable and less than minor transport effects.

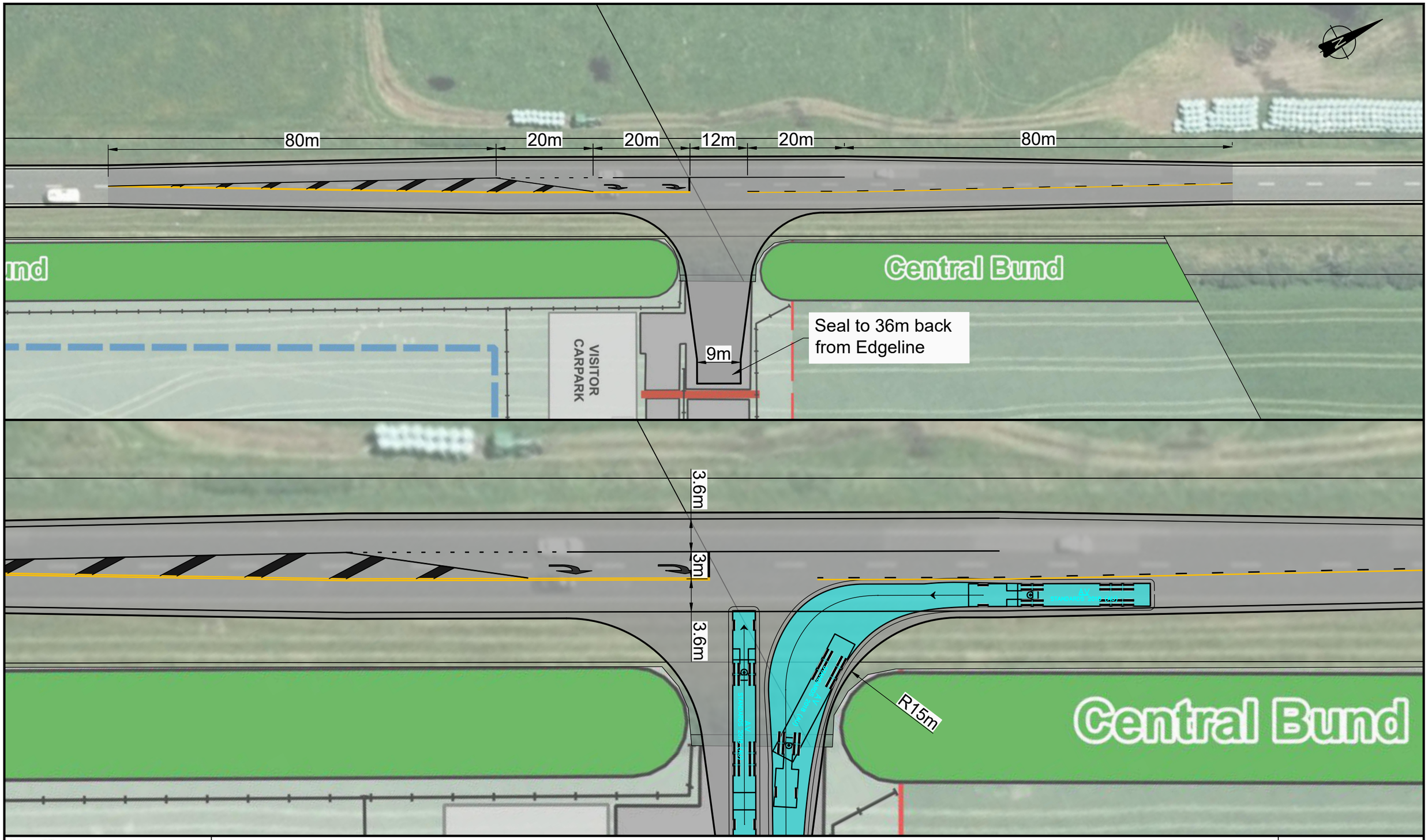
# Appendix 1

# Application Plans


MANANUI PLANT & SITE LAYOUT CONCEPT OVERVIEW
Westland Mineral Sands Co.
N
Central Bund
STATE HIGHWAY EXTENSION AREA
ROAD TRUCK & HEAVY MACHINERY SITE ACCESS
LV SITE ACCESS
VISITOR CARPARK
SITE OFFICE
STAFF CARPARK
WATER TREATMENT AREA
PRODUCT LOADOUT ZONE
ILMENITE STOCKPILE
GARNET STOCKPILE
LV WORKSHOP CARPARK
PLANT WORKSHOP
SITE LAB
WCP PLANT
MINE ACCESS
POWER
MCC
TANKS
LV WORKSHOP CARPARK
MACHINERY WORKSHOP
ROM HANDLING / PUMPING ZONE
MINE ACCESS
FENCES
GATE
12W x 3H Bund
Property Titles
230829_Plant area v2
0
50
100
150
200 m

# Appendix 2

# Access Plans




# Project Mananui
# Westland Mineral Sands Co. Ltd

## Access Arrangement

**For Resource Consent**

Drawing: **746-008_Mananui_DWD100X-C**

Sheet **746-008-DWD1001-B**

Scale @A3 1:750

Date 03/10/2023

By N Fuller

Project # 746-008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# Appendix 3

# Transport Compliance Assessment

| RULE | COMMENT | COMPLIES? |
|---|---|---|
| **8.9 - Access** | | |
| **8.9.1 General**<br>1. Every owner or occupier of land shall provide vehicular access to the site for parking and loading over the site by provision of a vehicle crossing constructed from the carriageway of the road or service lane to the boundary of the site.<br>2. Vehicular access shall be designed, constructed and maintained to ensure that they are able to be used in all weather conditions; stormwater and detritus do not migrate onto the road; and are suitable for the volume and weight of traffic likely to use the access.<br>3. Where vehicular access to the rear of a commercial or industrial site is possible by means of a dedication or use of a service lane, or land over which the rights-of-way are held in respect of that site, such means of access shall be provided for parking and loading spaces in preference to any new vehicular crossing over any footpath. | The proposed access will comply | Yes |
| **8.9.2 Access to a State Highway**<br>A new property access, or the change in character, intensity and scale of the use of an existing access, to a State Highway shall be a permitted activity provided the following criteria are met:<br>a. The traffic generated through the access is less than 100 equivalent car movements per day 1 (average usage).<br>b. No legal access is available from another road.<br>c. Compliance with the performance criteria given in Table 8.9.1 regarding sight distance, clearance from intersections and minimum access spacing.<br>d. Vehicle crossing design and/or localised road widening is provided in accordance with Figures 8.1 (c) and (d).<br>If any one or more of the criteria a, b, c, d above are not able to be met, the access shall be a restricted discretionary activity with the Council's discretion restricted to access considerations specified in Appendix E<br><br>**Requires: 210m sight distance, 200m separation between the State Highway and an access within the site, 200m separation to adjacent accesses on SH6 and 60m separation to adjacent intersections.** | **The proposed activity will generate greater than 100 equivalent car movements per day.**<br>210m sight distance is provided.<br>**Access is not in accordance with Figure 8.1(d)**<br>200m separation is required between accesses. There is sufficient separation to accesses on the same side of the road, **but only 178m separation** to an access on the opposite side of the road.<br>Greater than 60m separation is provided to intersections. | **No** |
| **8.9.3 Access to roads other than state highways.**<br>1. Width of Vehicle Access Strips - Access strips shall not be less than the following widths in Urban zones:<br>- 3.5 metres to one rear lot<br>- 4.0 metres to two or three rear lots<br>- 5.0 metres to four or more rear lots<br>Access strips shall not be less than 6 metres width to all lots in the Rural zone. | Not applicable, as access is to a State Highway. | N/A |
| 2. Location of Vehicle Crossings<br>Vehicle access shall be a minimum of 50 metres from any intersection in the Rural zone. Where the road frontage of any site in the Rural Zone lies entirely within 60 metres of any intersection the access shall be located within 12 metres of the side boundary of the side furthest from the intersection.<br>These distances shall be measured above the road boundary of the site to the (extension of the) nearest road boundary of | Not applicable, as access is to a State Highway. | N/A |

| RULE | COMMENT | COMPLIES? |
|---|---|---|
| the intersecting road.<br>In all other zones no part of a crossing shall be closer than 6m to a street corner. | | |
| 3. Site Distances<br>The minimum sight distances from an access onto or off a roadway shall be as specified in Table 8.9.3. | Not applicable, as access is to a State Highway. | N/A |
| **8.10 – Manoeuvring and Parking Space Dimenions For Cars** | | |
| **8.10.1 General**<br>Every owner or occupier of land shall provide for off-street parking and loading of vehicles used in conjunction with the site. All parking, loading and trade vehicle storage areas, except residential parking areas containing less than six spaces, shall be designed to ensure that vehicles are not required to reverse either onto or off the site.<br>All parking spaces shall be set back from the road at least 5m, measured either as a straight distance from the road boundary or curved.<br>The provision for parking required by the Plan may be made in any case as part of the yard space of any site.<br>Three or more activities on different sites may utilise a parking and loading area for their common use, the total provision to be the sum of their individual requirements. Council reserves the right to reimpose the individual requirement should circumstances change with respect to the right of any person to use the joint parking area. | Complies | Yes |
| **8.10.2 Vehicle Parking Standards**<br>Off street parking places on the site of the activity must be available according to the following requirements. At least one of the spaces required for commercial and industrial activities should be available for loading. Parking spaces must be formed and made available for use if need for them is generated by the activity.<br>(d) Industrial activities:<br>1 space per 100 $m^2$ of gross floor area<br>**Requires 33 car parks based on 3,335$m^2$ GFA of activity** | 33 car parks are required and 45 are proposed. | Yes |