

Graphics Bundle

For resource consent applications by TiGa Minerals and Metals Ltd to establish and operate a mineral sand mine on State Highway 6, Barrytown (RC-2023-0046; LUN3154/23)

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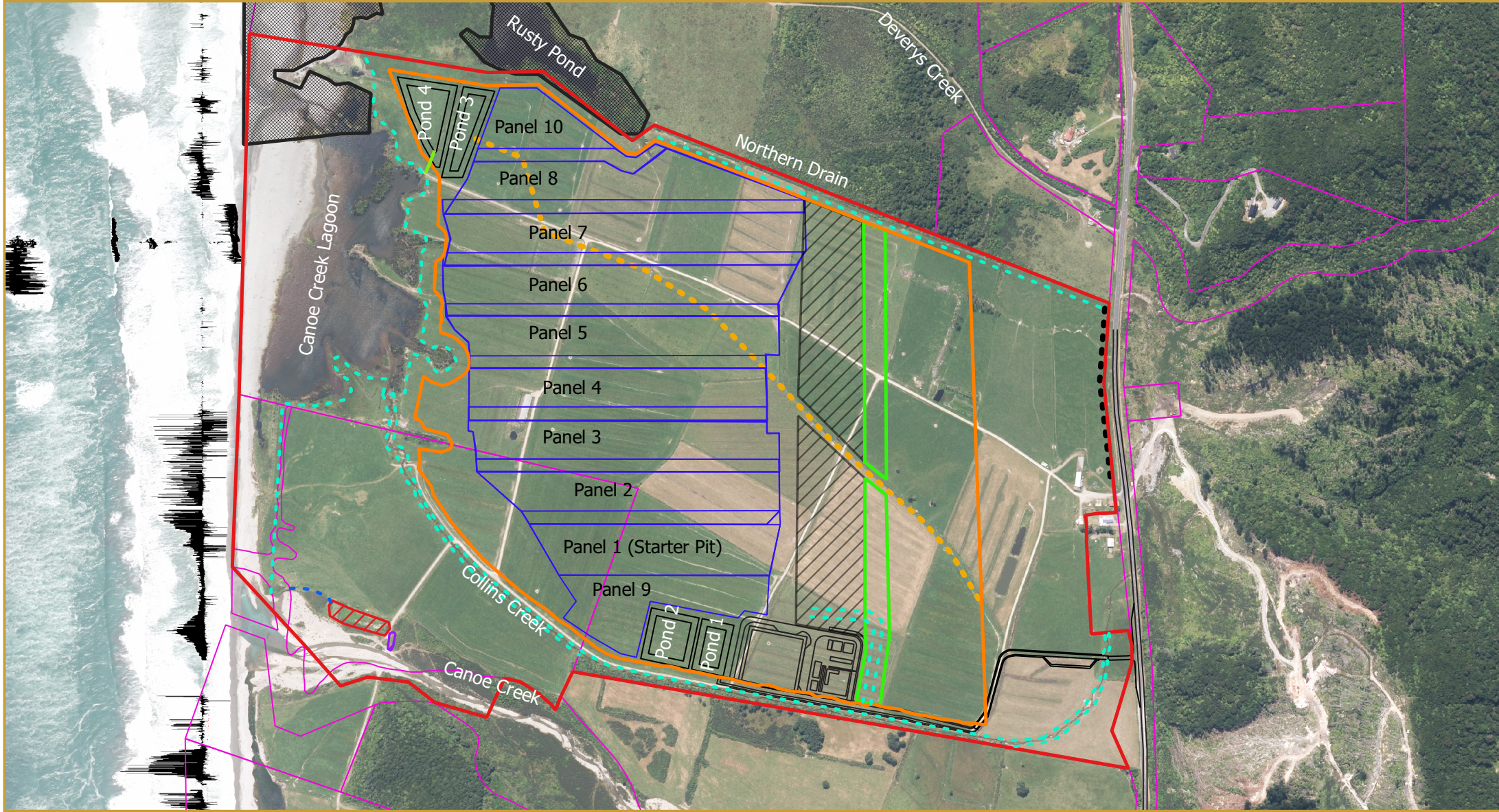
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TiGa Consent Application

Produced for: TiGa
by Luke McNeish on 18/01/2024



0 125 250 m
1:8,000 @ A3

Projection: WGS84 / NZTM2000
Background Imagery: ESRI Satellite
Data Sources: LINZ, Client and or TPRL Data

Legend:

- - - Planting

▨ Stockpile Area

▭ Mining Disturbance Area

▭ TiGa Application Area

— Bund

▭ Gallery Water Take

▭ Premining ore stockpile

- - - Overflow Channel

▭ Canoe Creek Infiltration Basin

• • • Bund and Planting

- - - Central Drain

▨ SNA

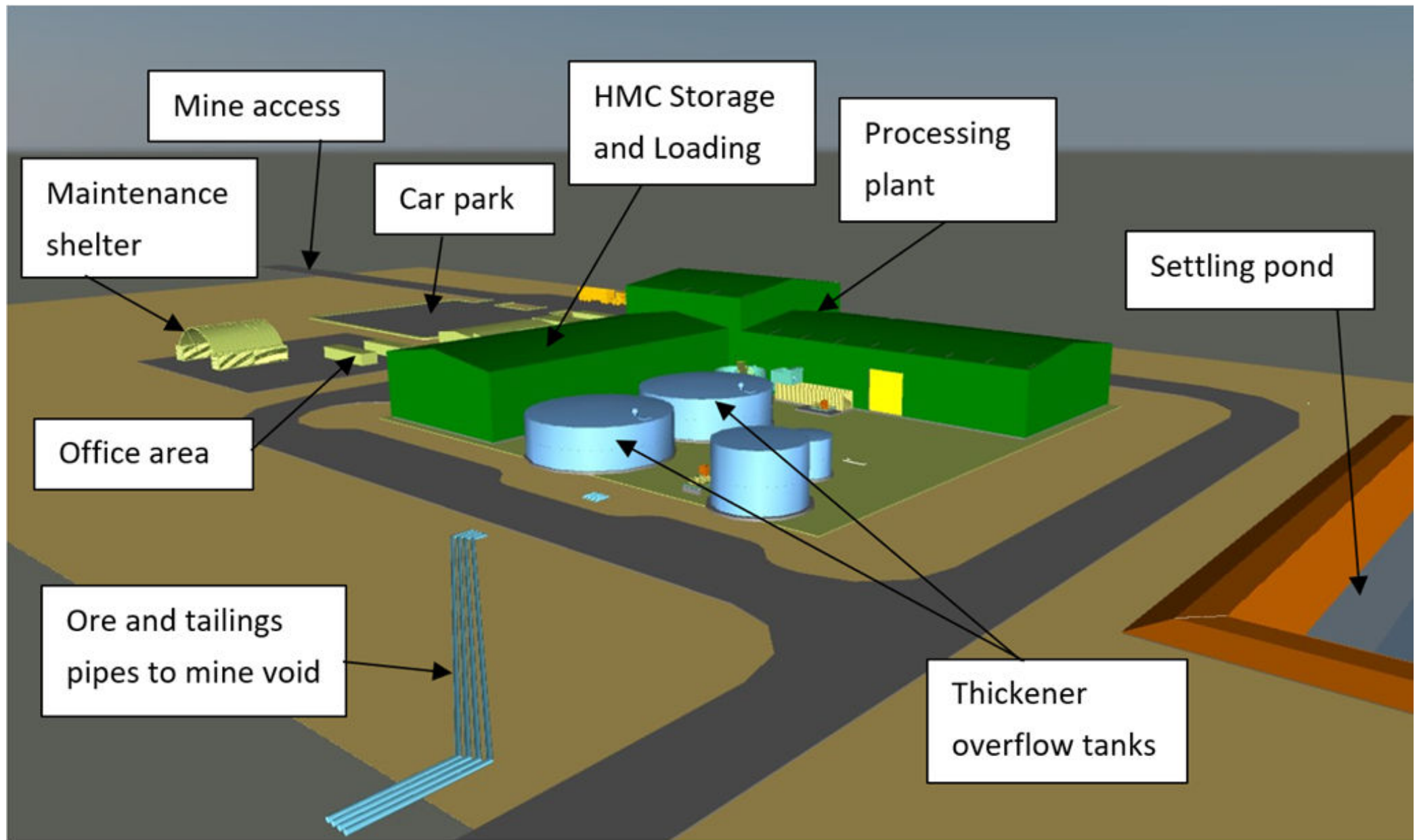
▭ Property Boundaries

— Mine Infrastructure

— Overflow Path

Note: Refer to Landscape Mitigation Plan for detailed information on planting and bunds.

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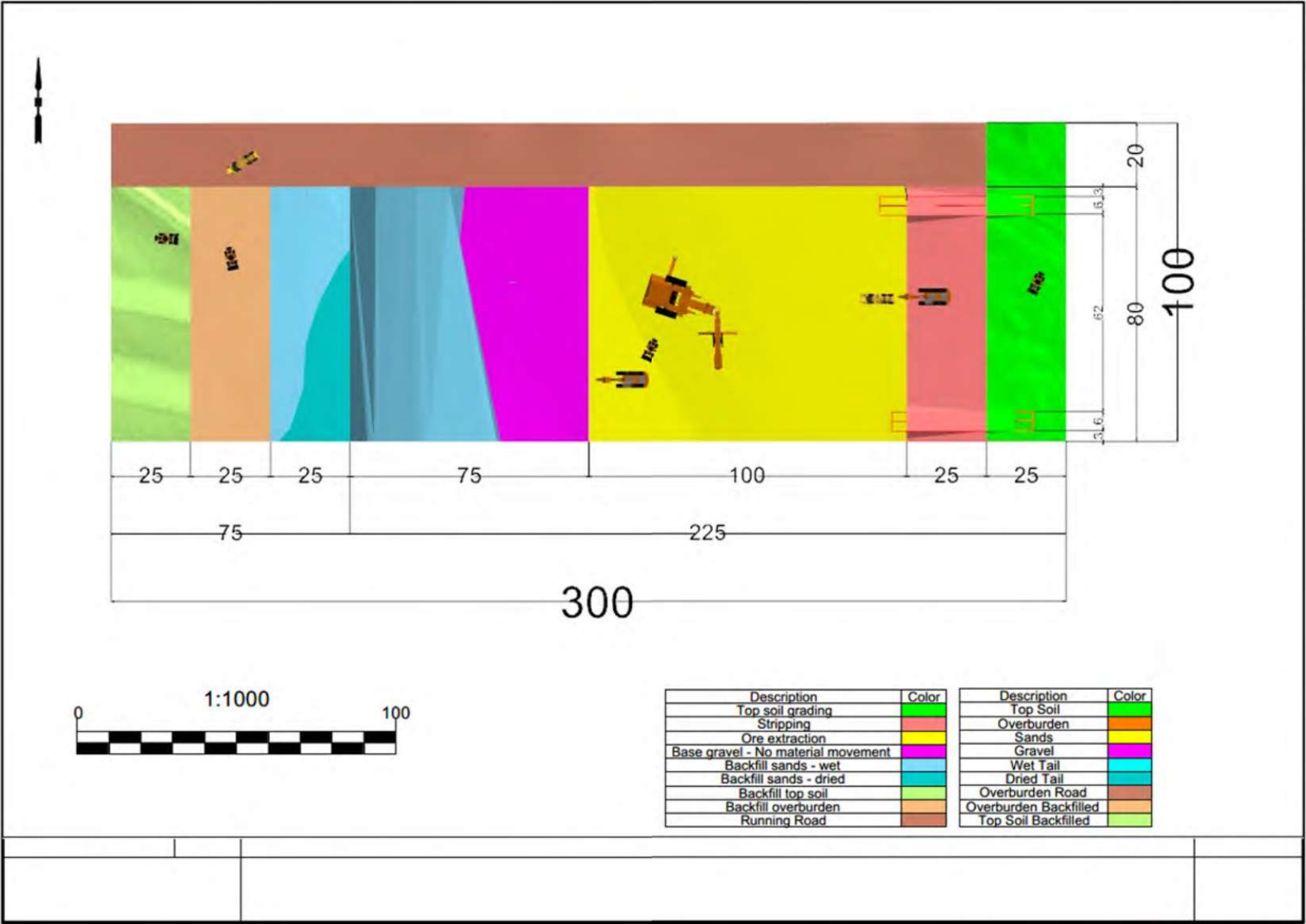
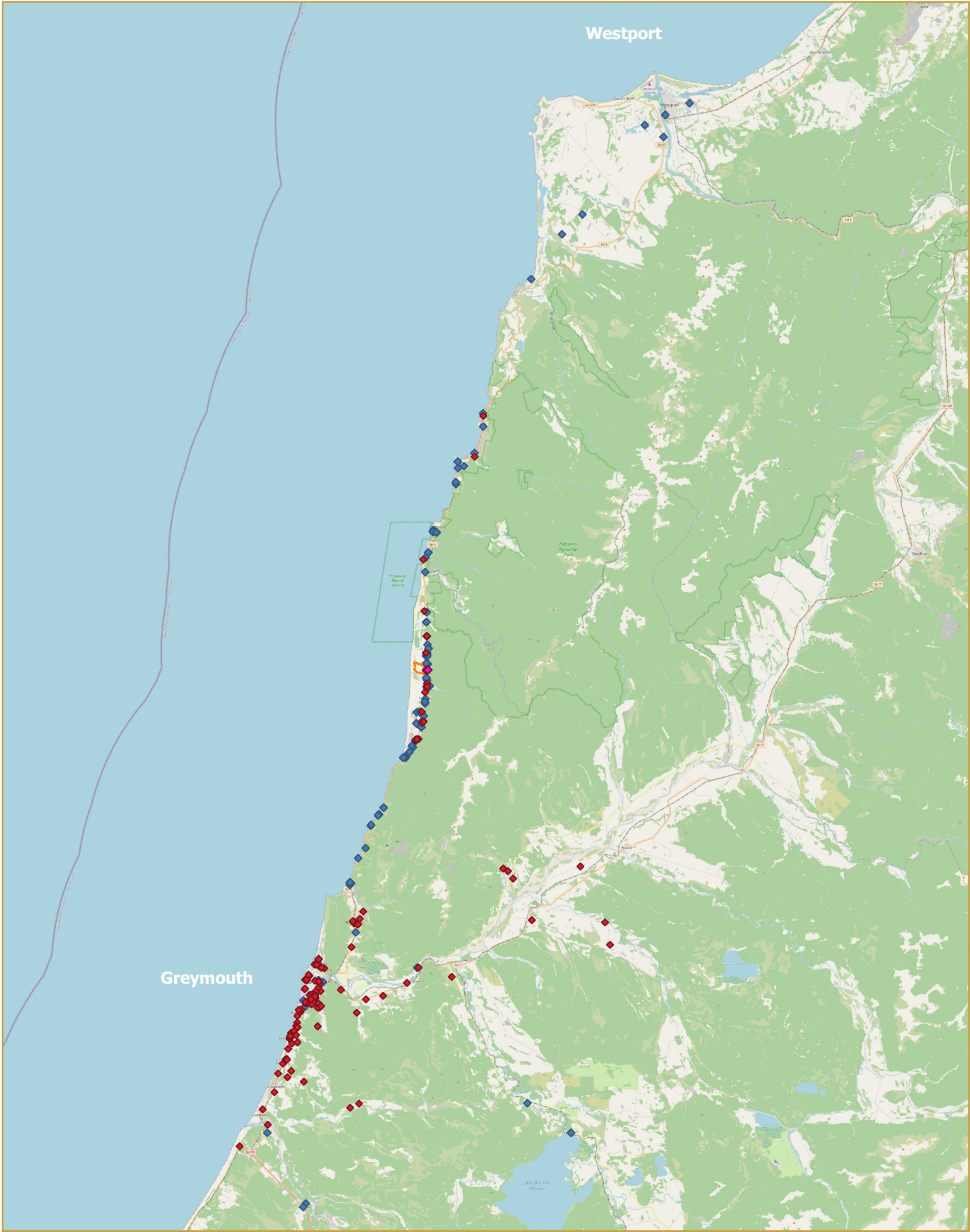


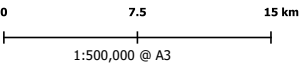
Figure 12.1 Extraction Sequence



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Submitter Location Map

Produced for: TIGA
by Luke McNeish (TPRL) on 19/01/2024



Projection: WSG84 / NZTM2000
Background Imagery: Open Street Map
Data Sources: LINZ, Client and/or TPRL Data

Legend:

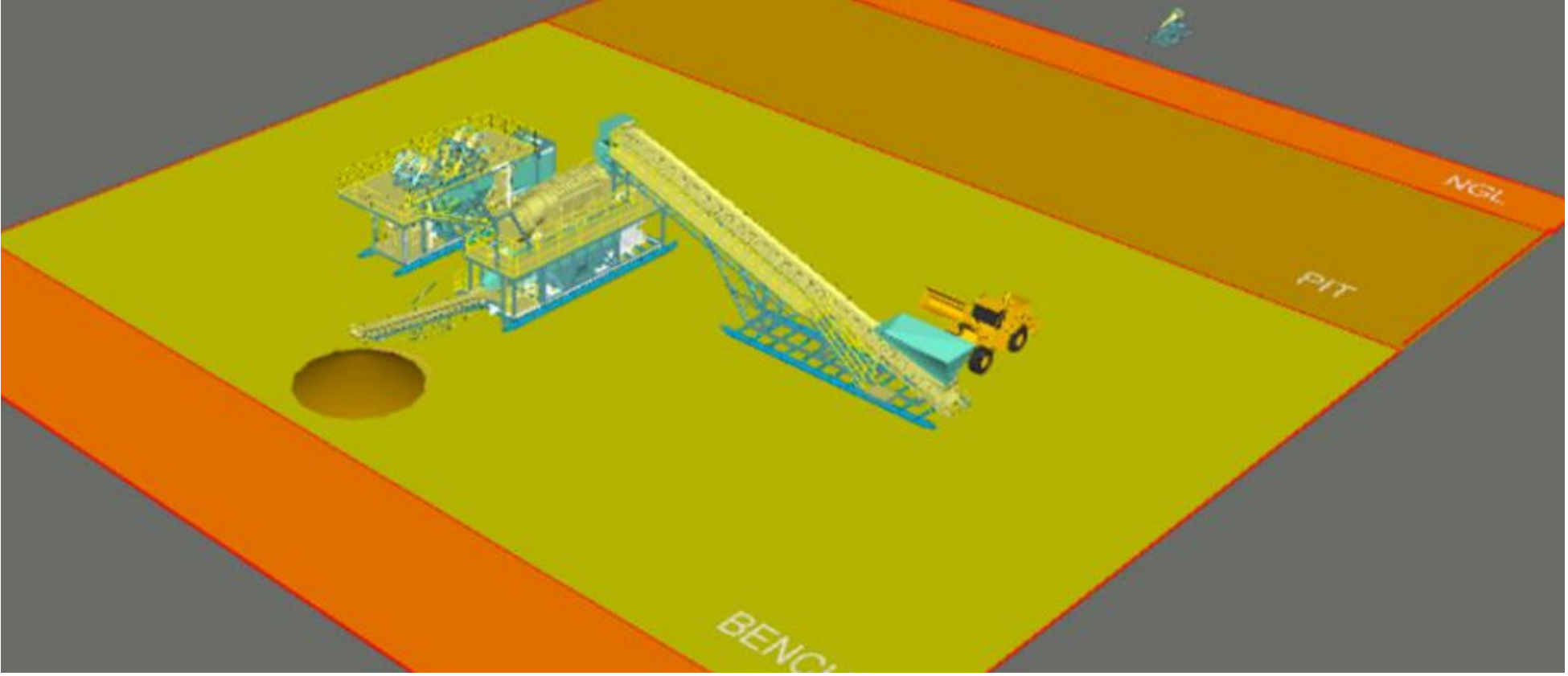
- ◆ Support
- ◆ Affected Party Approvals
- ◆ oppose
- ◆ Mining Disturbance Area
- ◆ Neutral

Section B

Plant design

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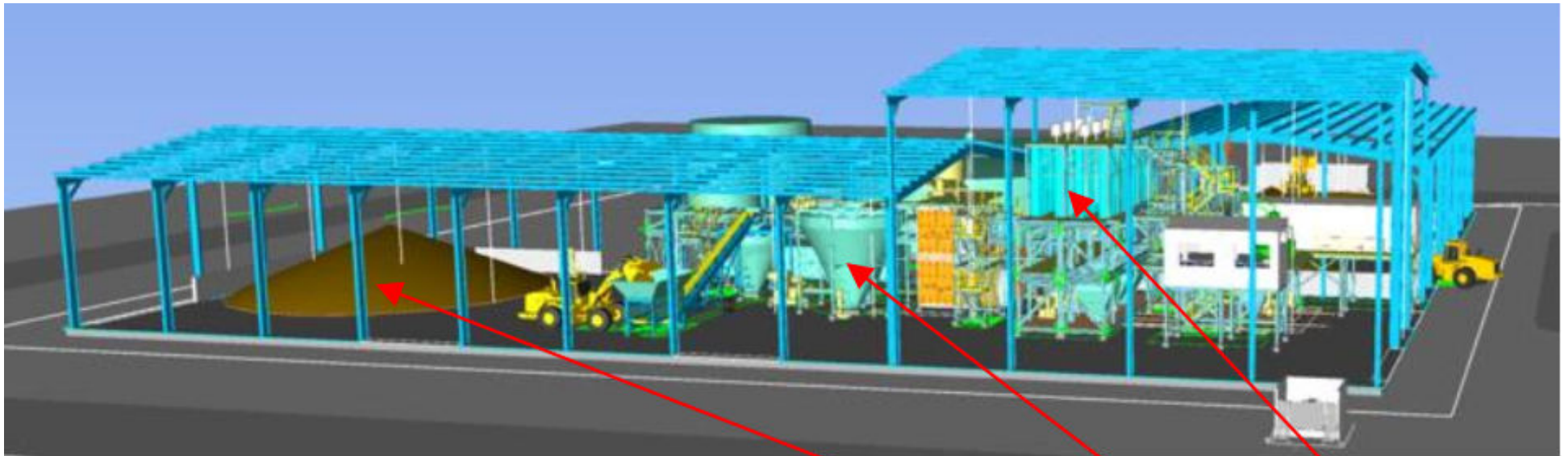


Figure 2: WCP Building (no cladding), Night Pile, CD Tank, Spirals

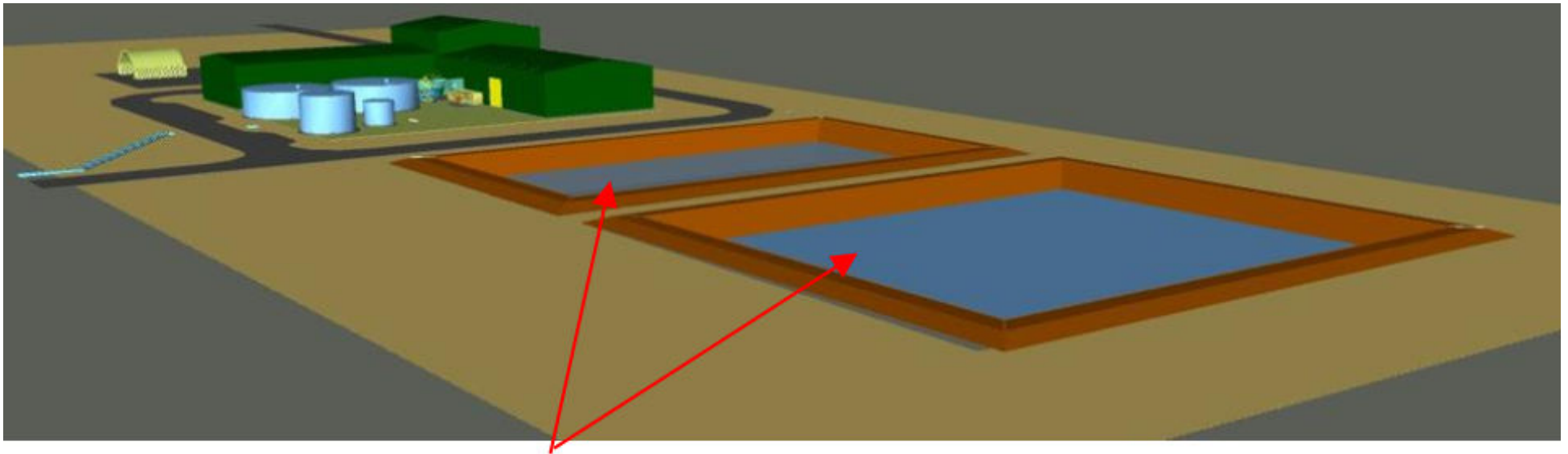


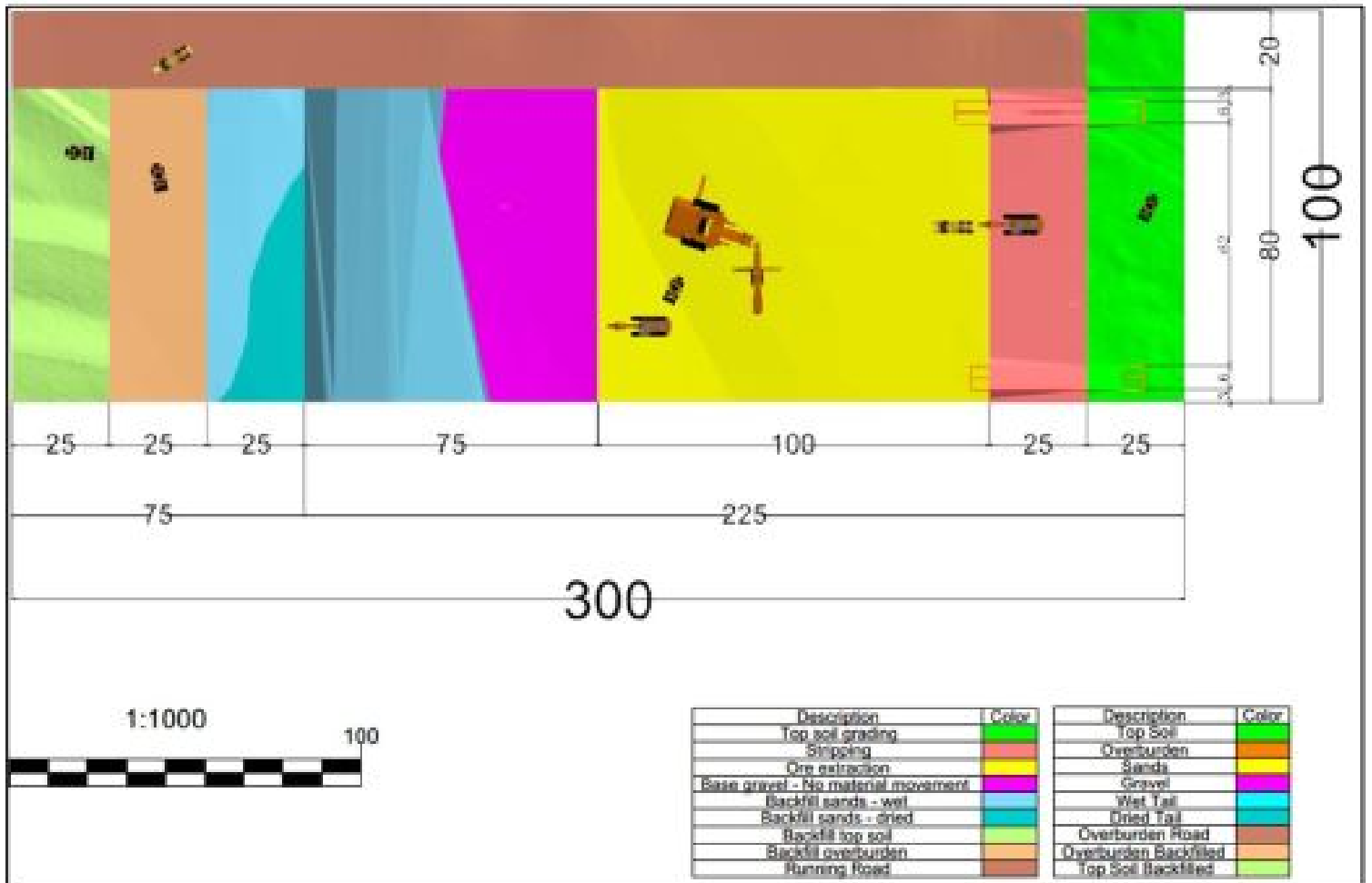
Figure 3: WCP with Mine Water Facility (Pond 1 and 2) in the Foreground

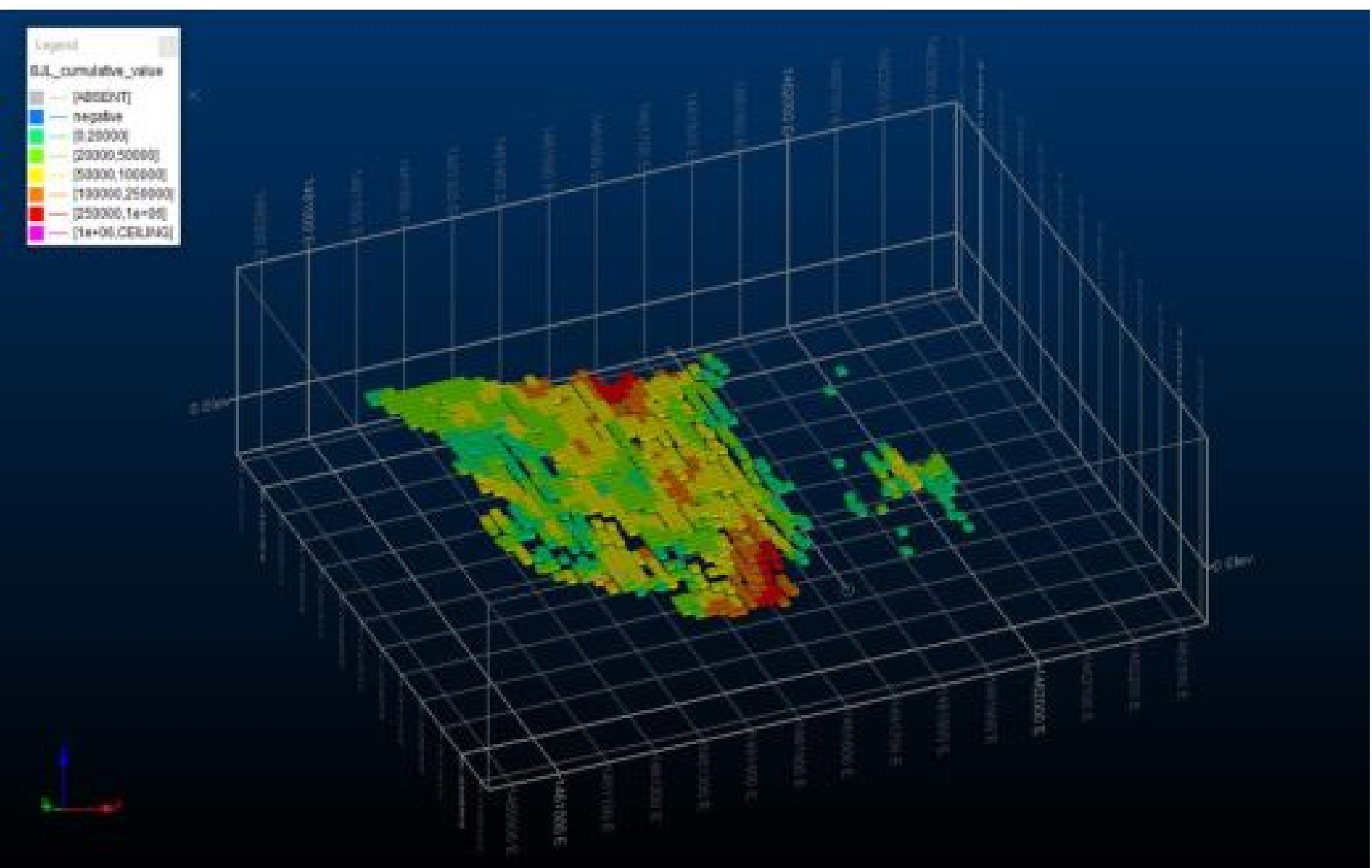
Section C

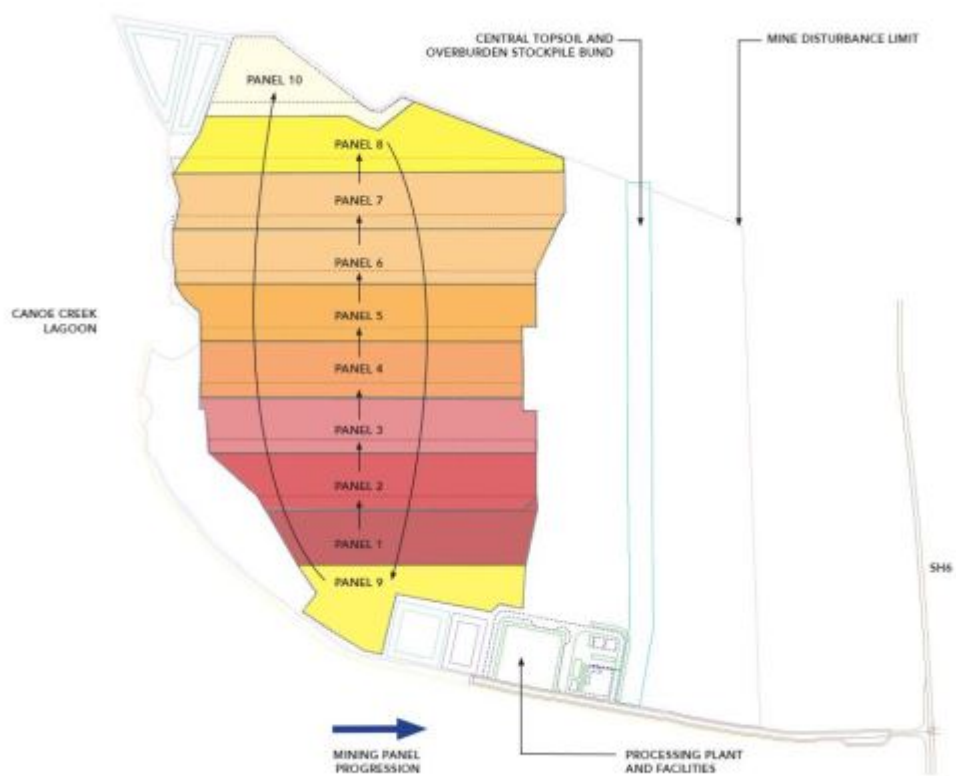
Mine planning

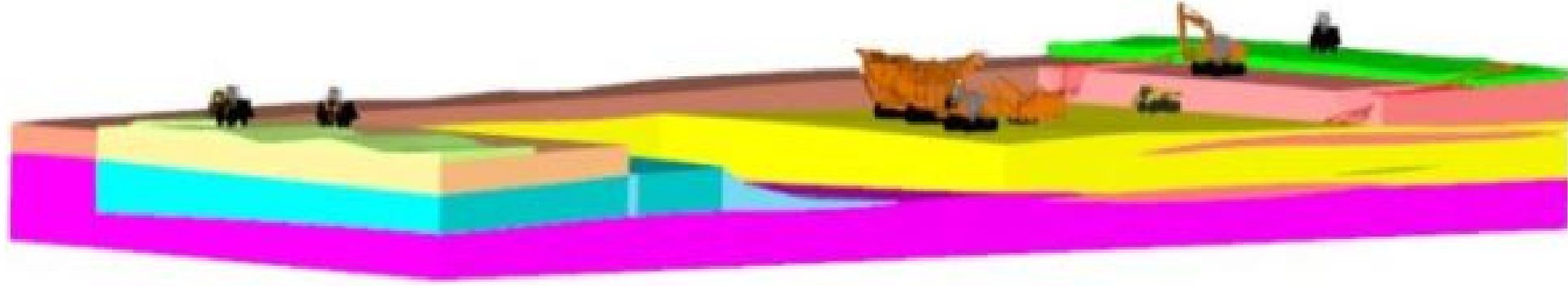
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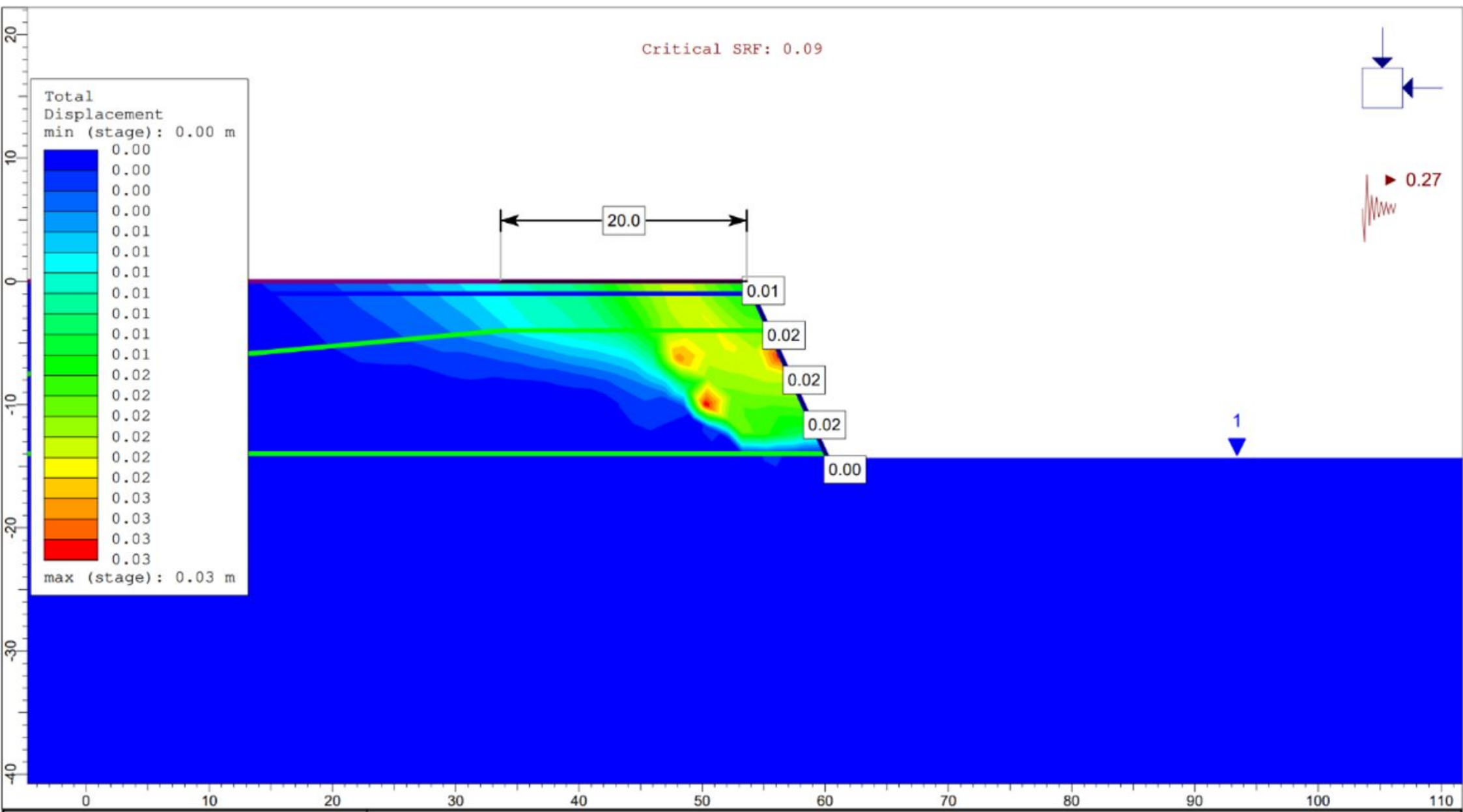






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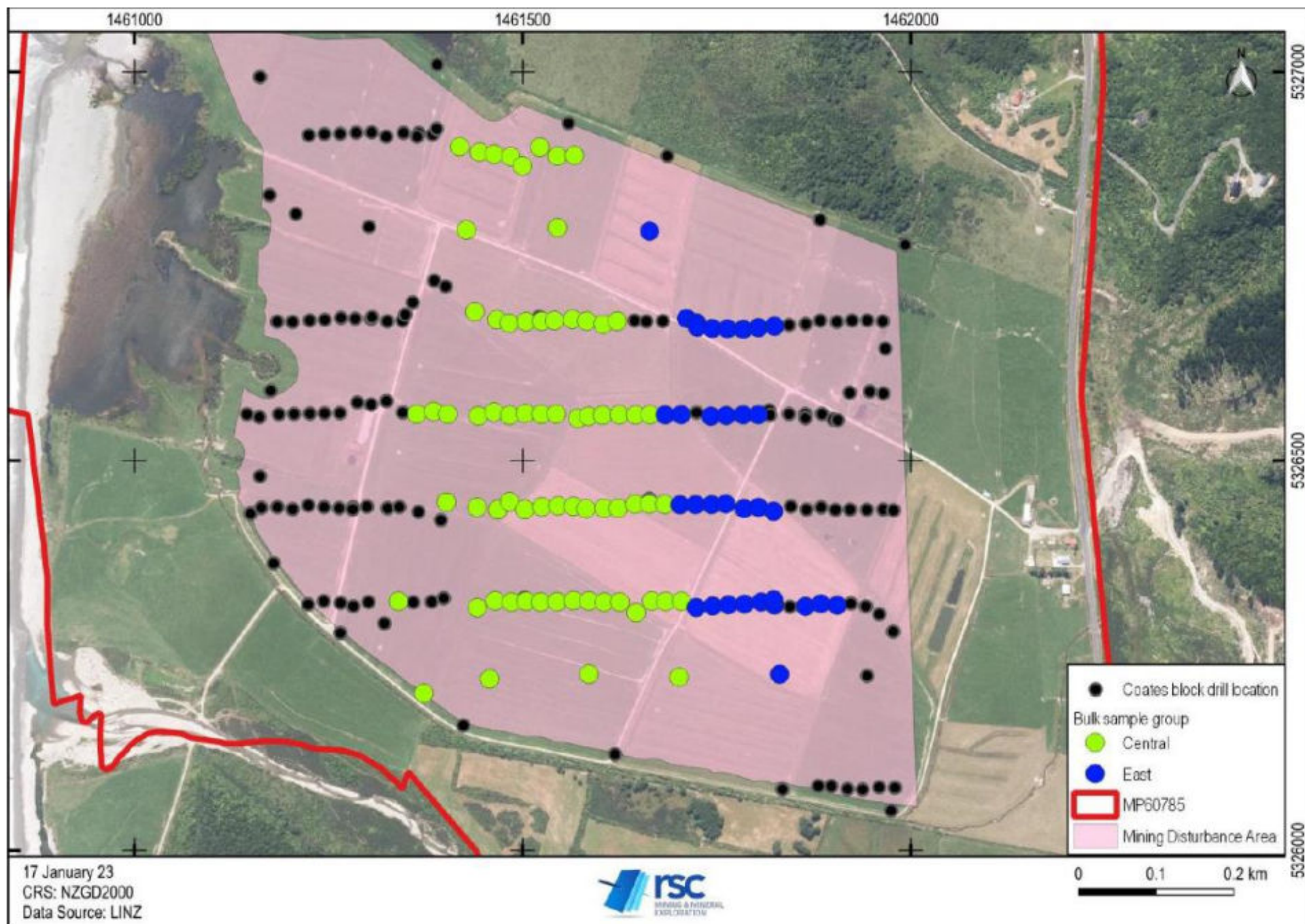


Section E

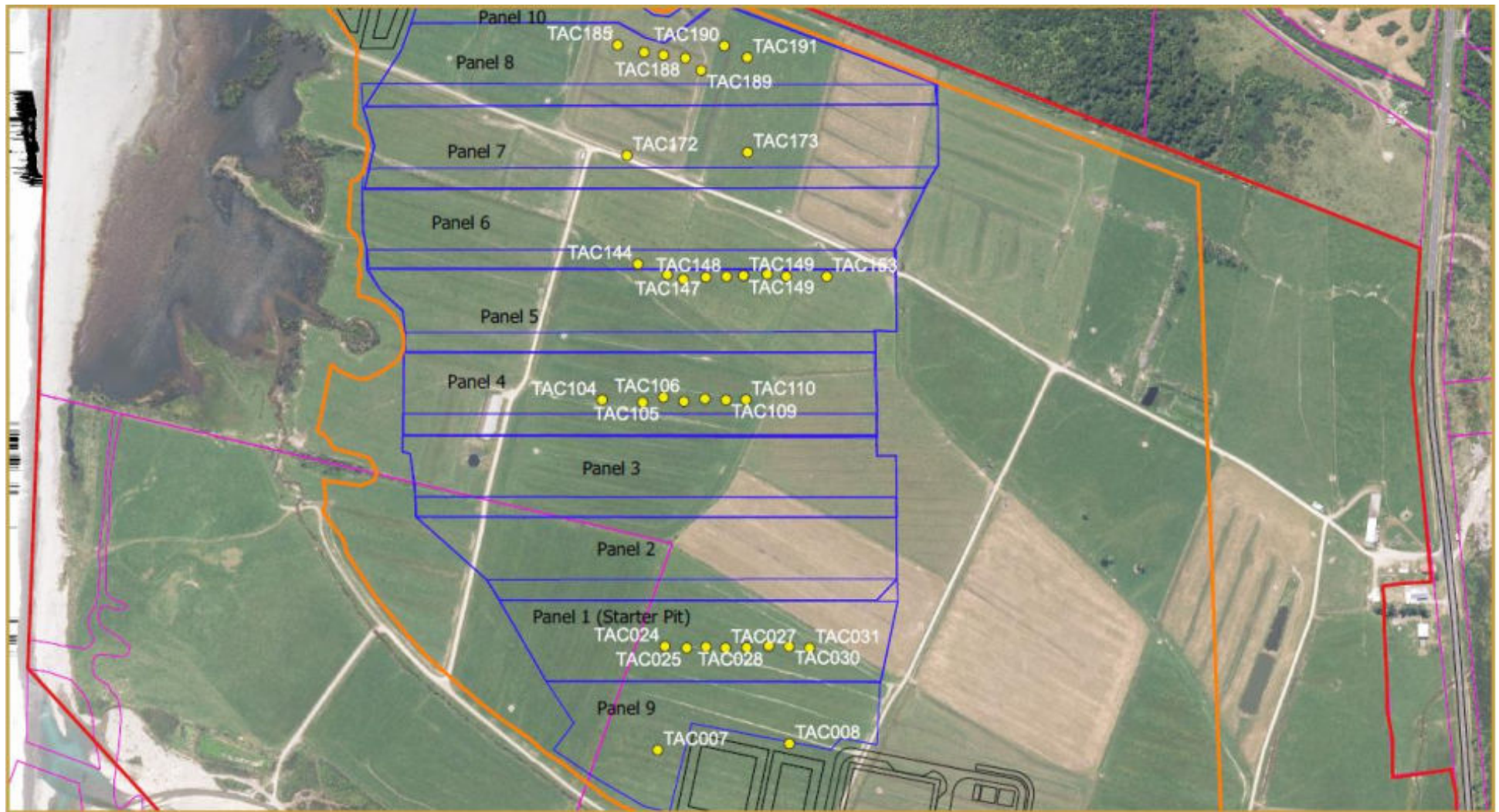
Metallurgy and radiation

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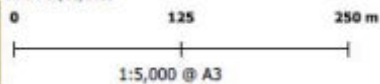




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TiGa Sample Locations Radiation

Produced for: TiGa
by Luke McNeish on 22/03/2023



Projection: WGS84 / NZTM2000
Background Imagery: ESRI Satellite
Data Sources: LINZ, Client and or TPRL Data

Legend:

- Mining Disturbance Limit
- Property Boundaries
- Application Area
- Mining Panels
- Mine Infrastructure
- Radiation Sample Collars

Section F
Terrestrial ecology
Index

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2	Evidence Graphics Bundle-Birds of Conservation Concern	25
3	Evidence Graphics Bundle-SNA	26



- Site boundary
- Mine panels (indicative)
- Water treatment ponds
- Wetlands
- 100m setback - wetlands
- SNA defined in the TTPP
- 100 m setback from SNA
- Watercourses
 - Permanent
 - Intermittent
 - Ephemeral

Proposed Pond 4

Proposed Pond 3

Deverys Creek

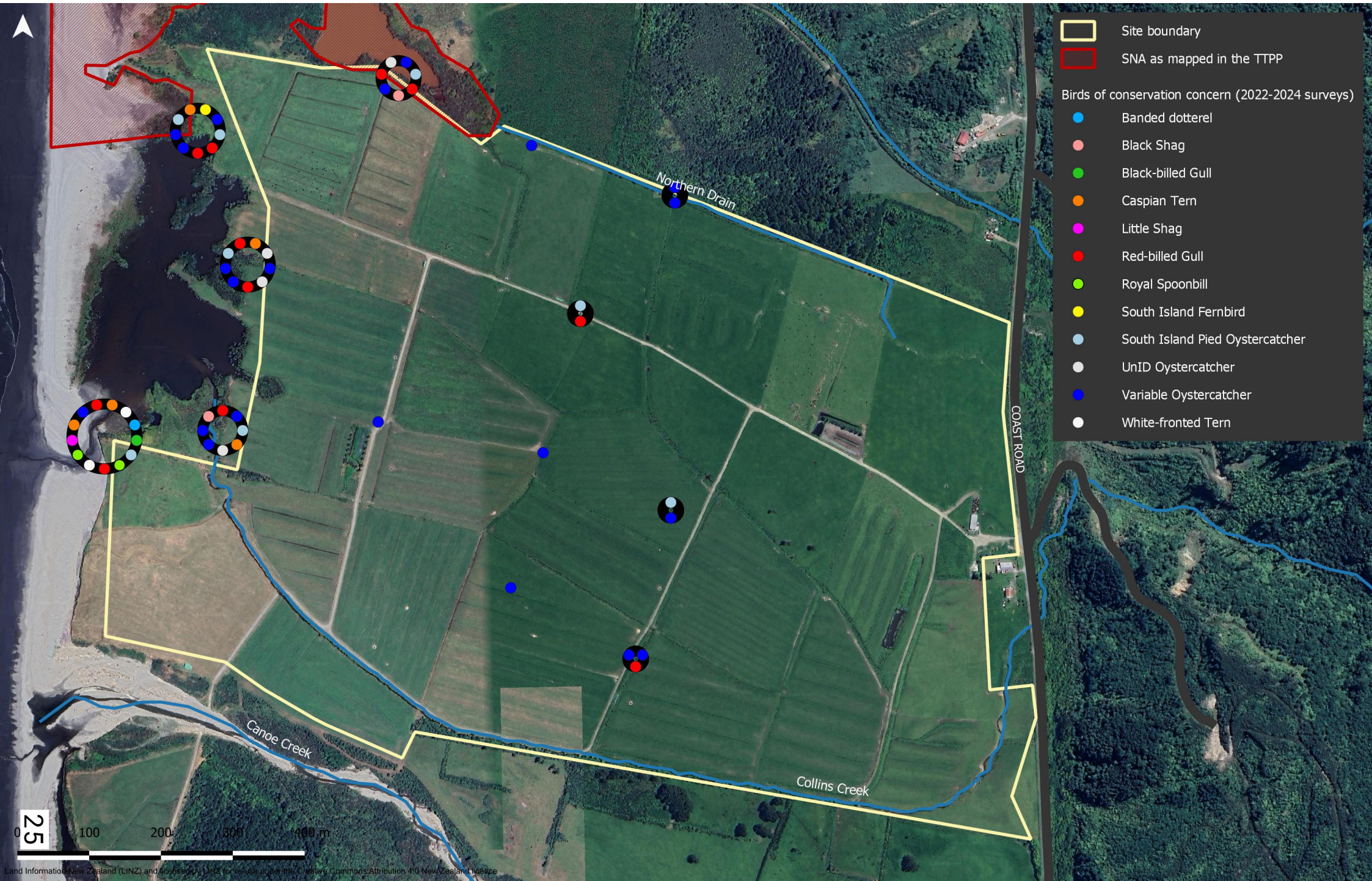
Northern Drain

COAST ROAD

Collins Creek

Canoe Creek

0 100 200 300 400 500 m





- Site boundary
- SNA defined in the TTPP
- Watercourse
- Lagoon

Deverys Lagoon

Rusty Pond

Collins Creek Lagoon

Canoe Creek Dune Slack

BURKE ROAD

COAST ROAD

Deverys Creek

Northern Drain

Collins Creek

Canoe Creek

0 100 200 300 400 m

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Aquatic ecology
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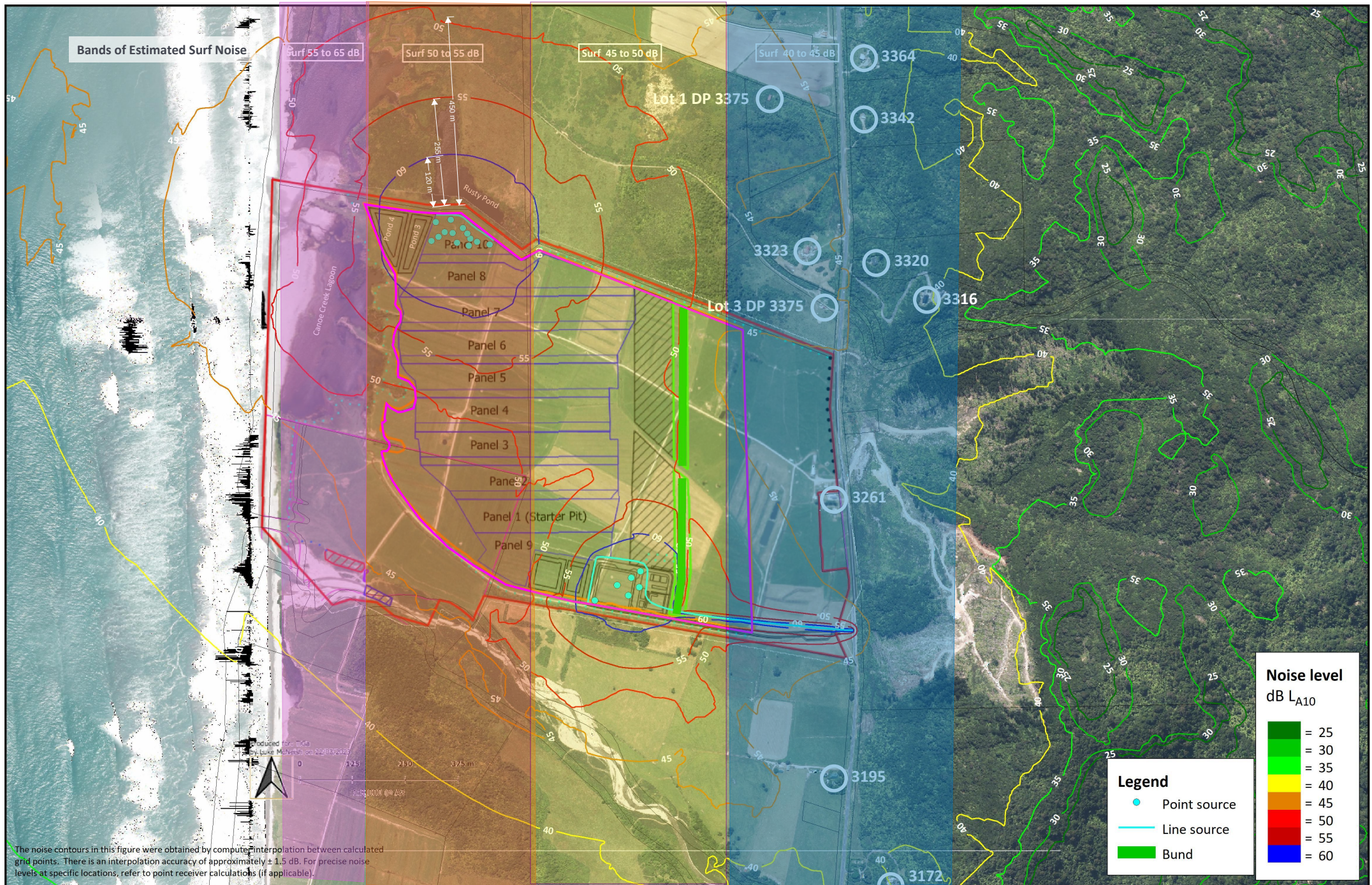


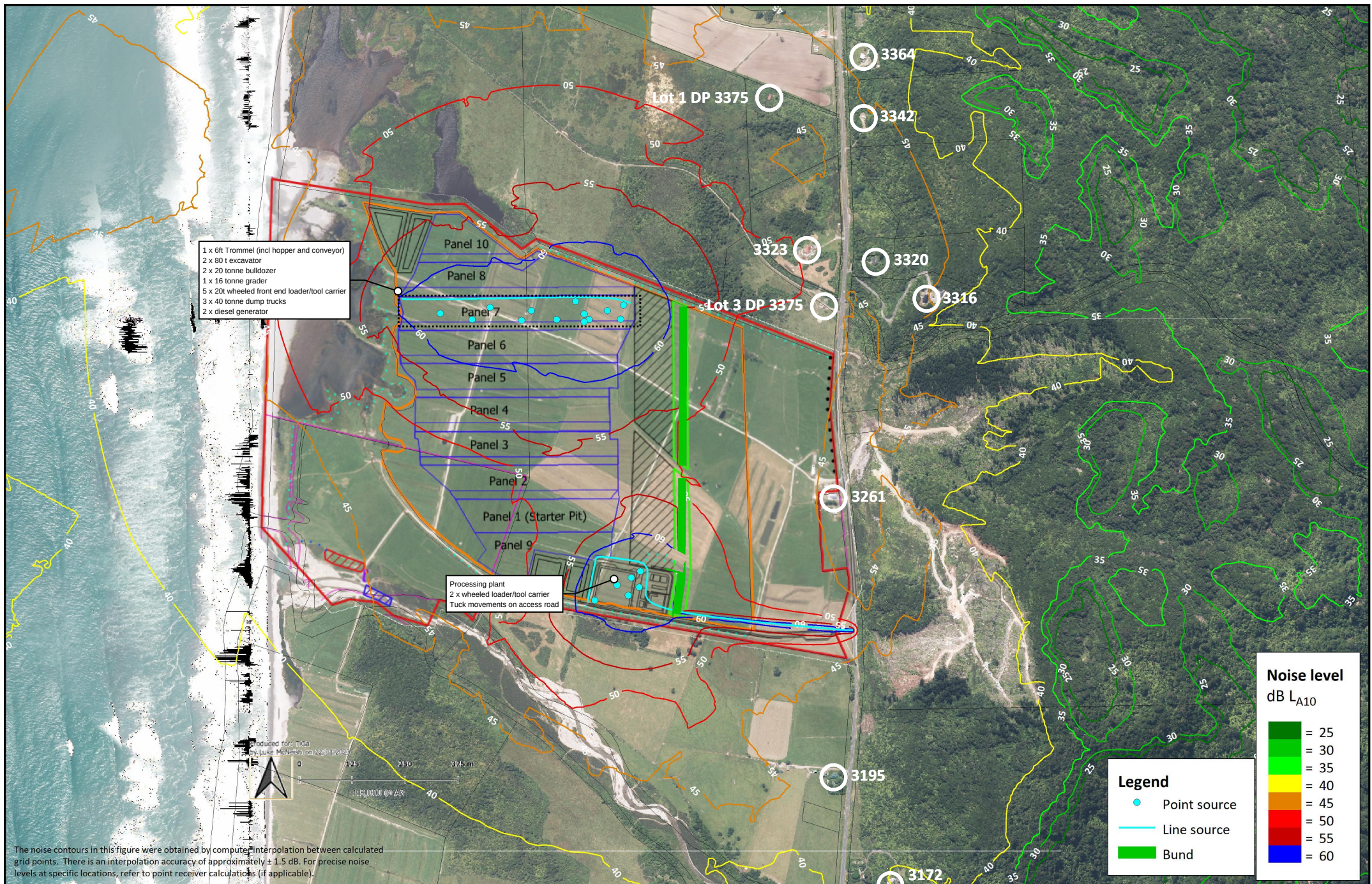
Section H

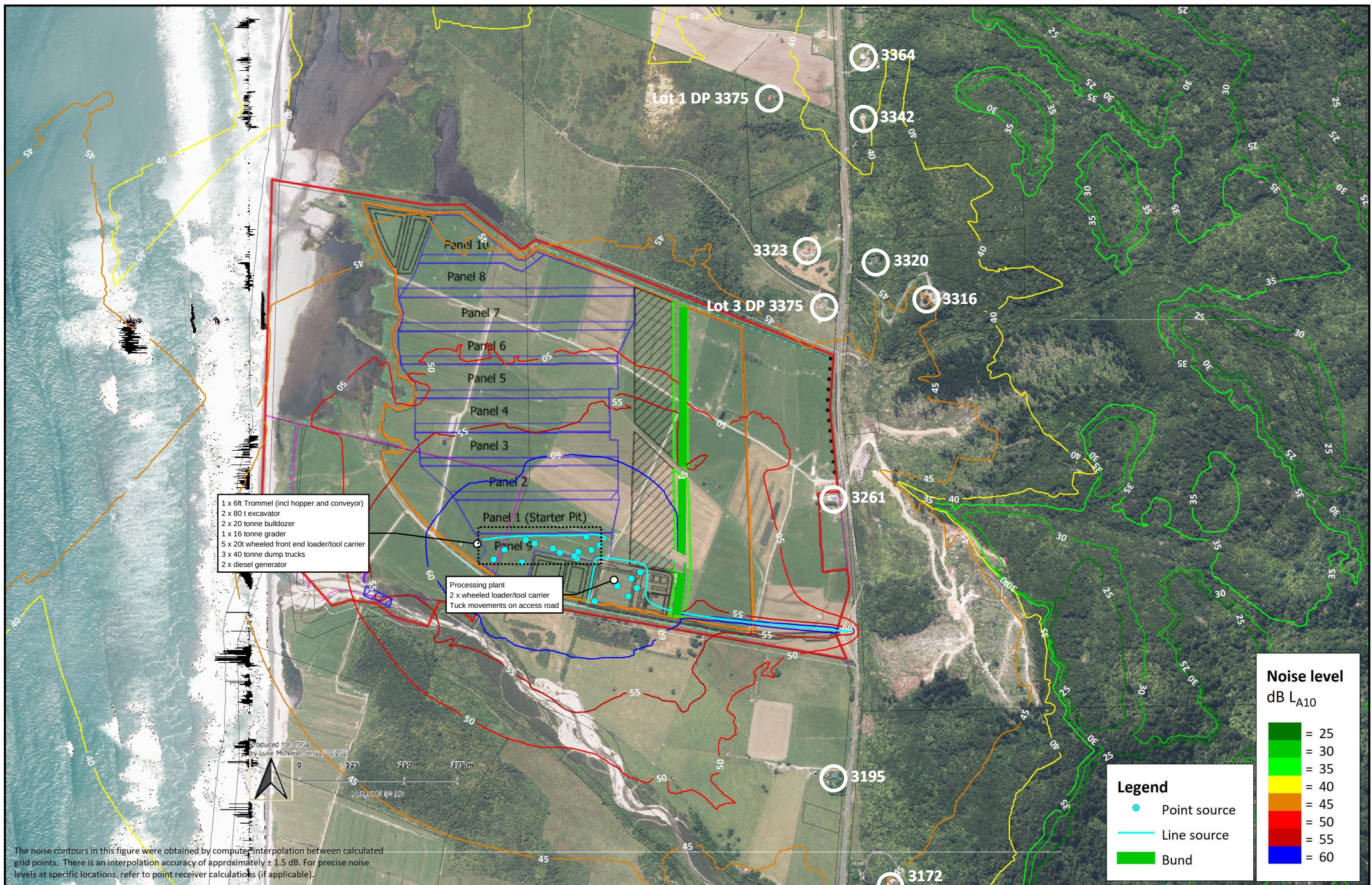
Noise

Index

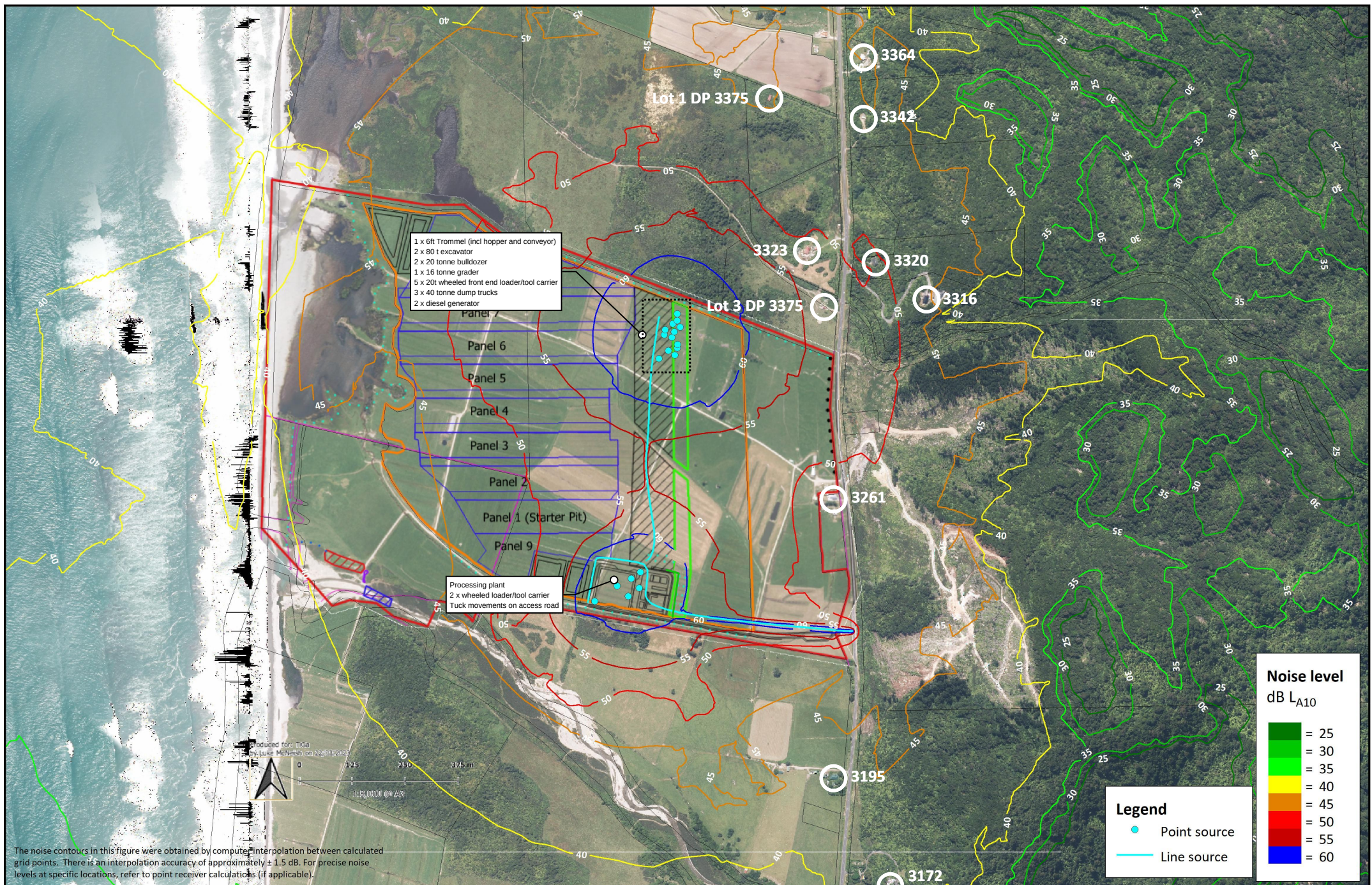
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5	Daytime – Final mining phase – South	32
6	Night-time – Processing Plant	33



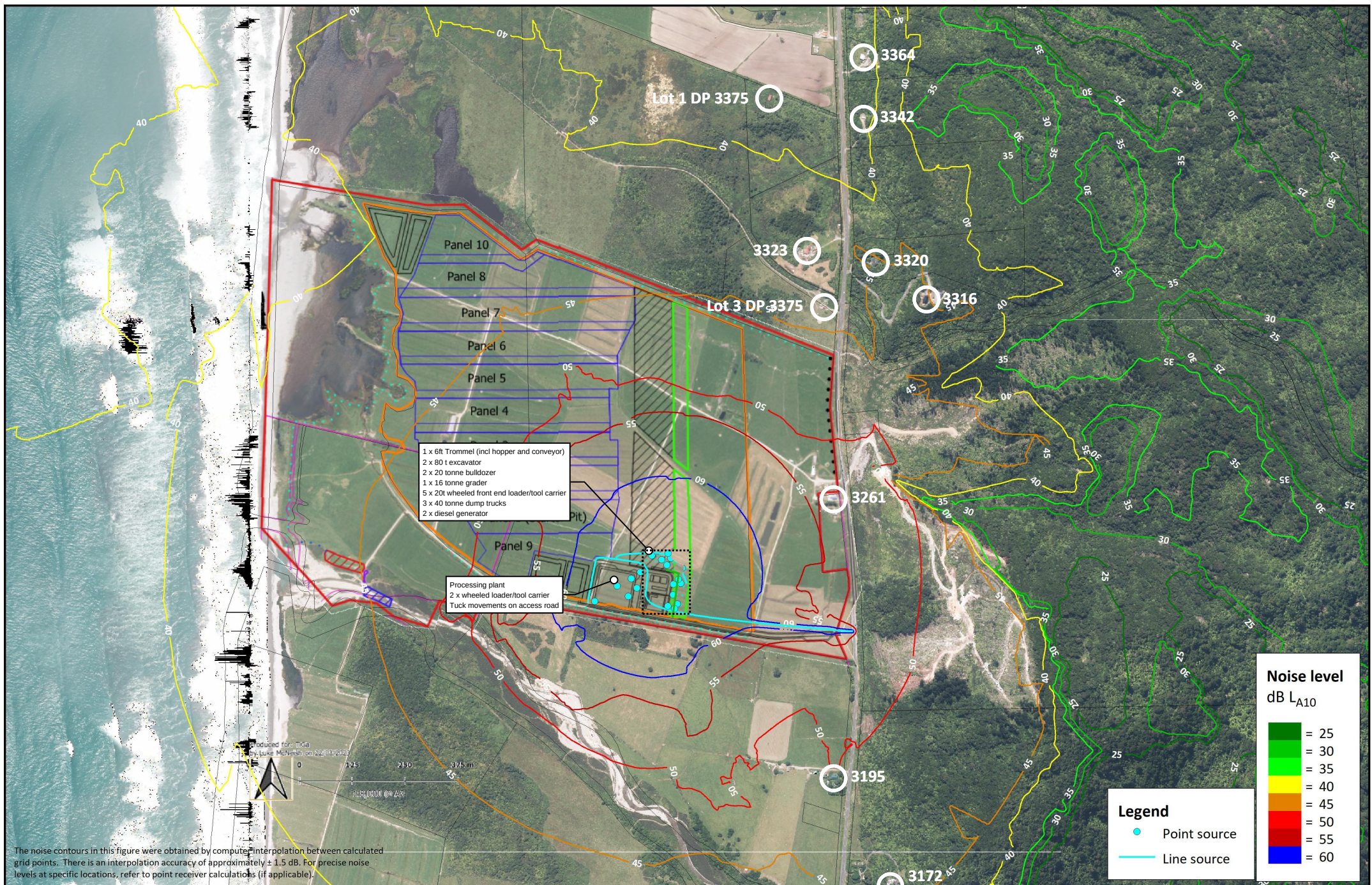


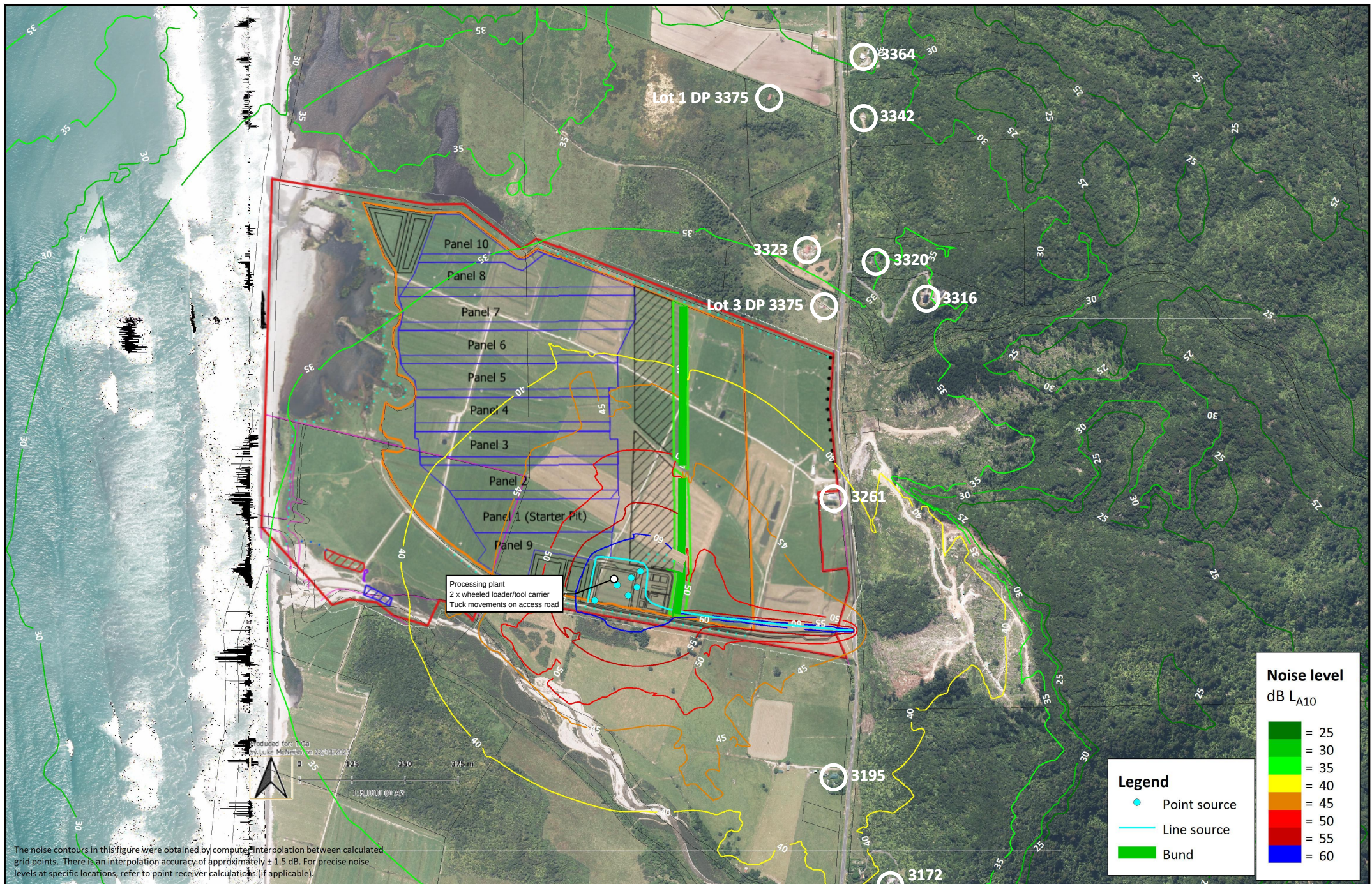


The noise contours in this figure were obtained by computer interpolation between calculated grid points. There is an interpolation accuracy of approximately ± 1.5 dB. For precise noise levels at specific locations, refer to point receiver calculations (if applicable).



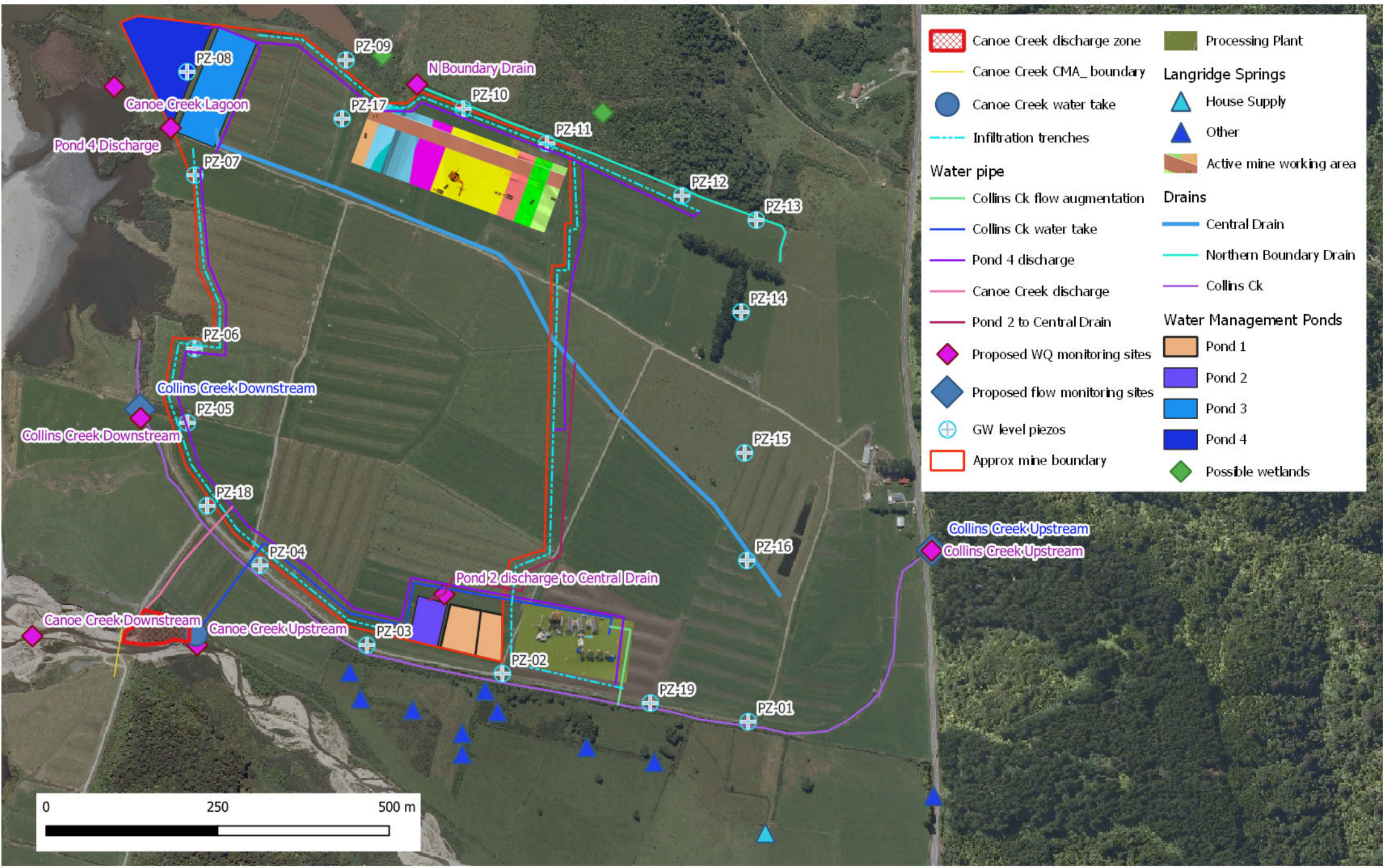
The noise contours in this figure were obtained by computer interpolation between calculated grid points. There is an interpolation accuracy of approximately ± 1.5 dB. For precise noise levels at specific locations, refer to point receiver calculations (if applicable).





Section I Hydrology Index

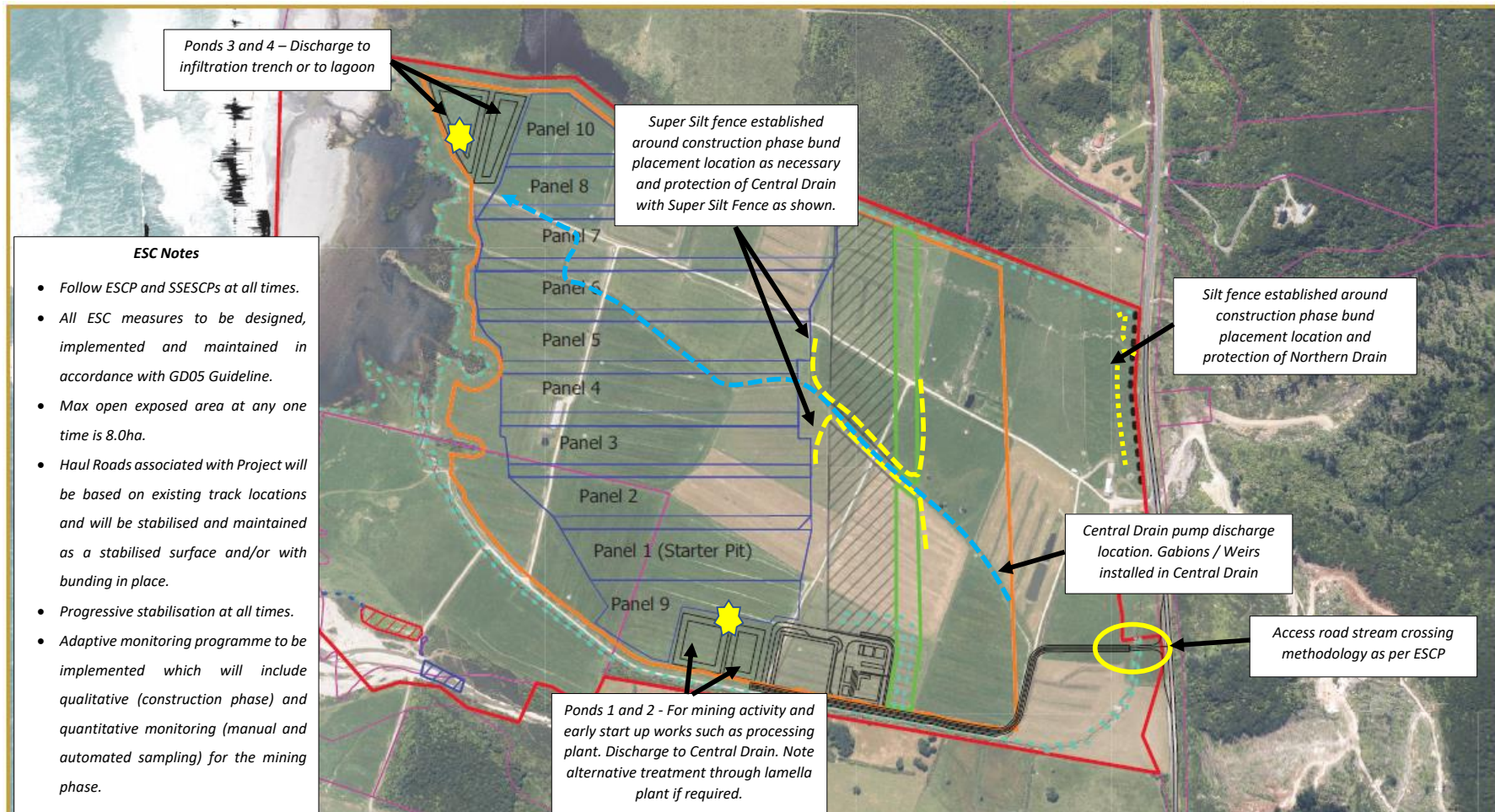
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Erosion and sediment control
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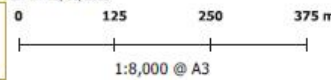
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Barrytown ESCP Overview Concept Plan



TiGa Consent Application
Amended Map

Produced for: TiGa
by Luke McNeish on 12/06/2023



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Projection: WSG84 / NZTM2000
Background Imagery: ESRI Satellite
Data Sources: LINZ, Client and/or TPRL Data

Legend:

- Planting
- TiGa Application Area 21022023
- Bund
- Gallery Water Take
- Watertake Location
- Premining ore stockpile
- Mining Disturbance Area
- Mine Infrastructure
- Overflow Channel
- Water Infiltration Area
- Mining Strips
- Bund and Planting
- Property Boundaries



Automated Sampling Locations

Note: Refer to Landscape Mitigation Plan for detailed Information on Bunds and Planting.

Section K

Coastal

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Gravel barrier



**Lower wider barrier
subject to washover**

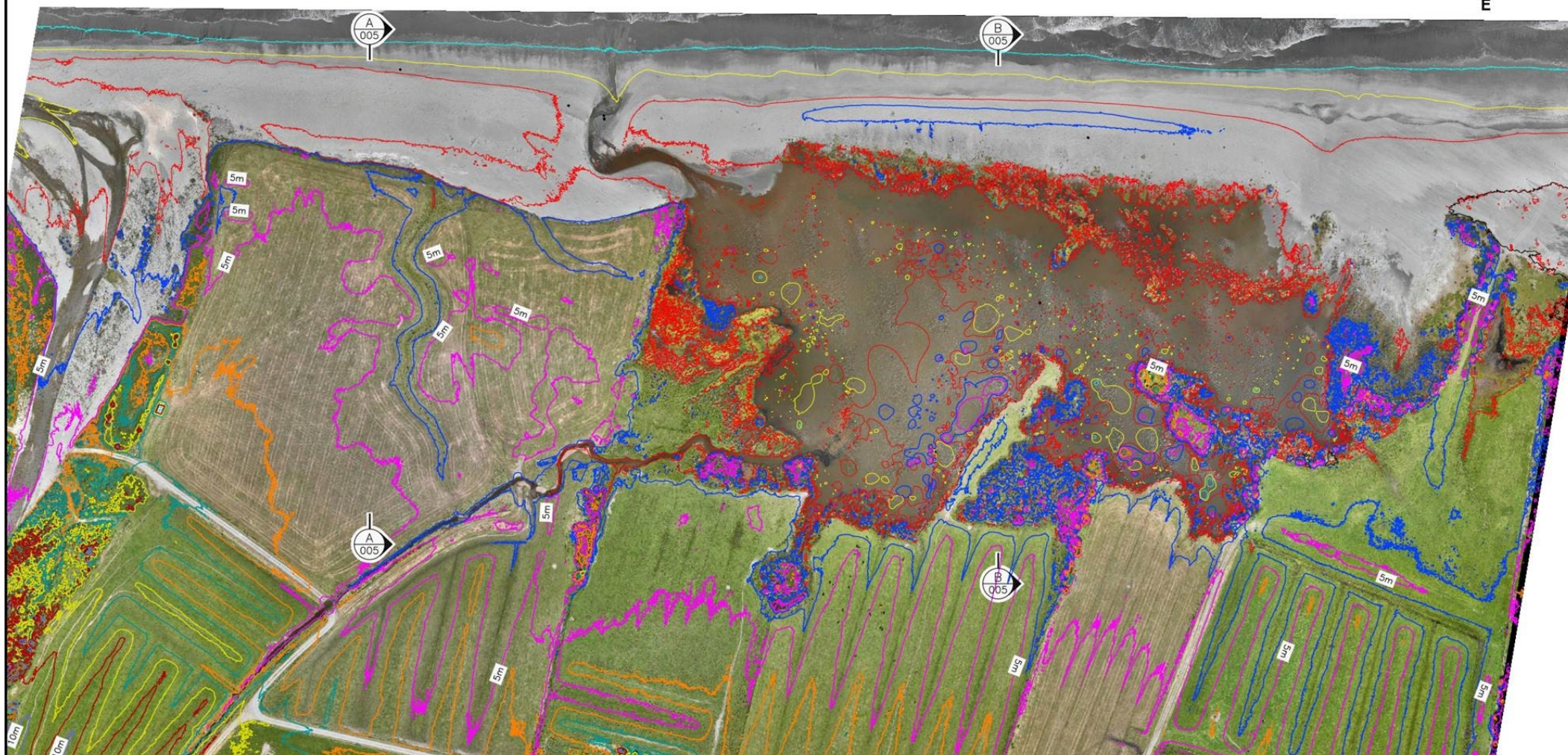


Aerial view of site and its relation to the coast



Littoral drift





CONTOUR PLAN

Scale 1:2500



Scale 1:2500

DO NOT SCALE FROM DRAWING

LEGEND:

1m	9m
2m	10m
3m	11m
4m	12m
5m	13m
6m	14m
7m	15m
8m	

NOTE:

1. AERIAL PHOTOGRAPHY AND TOPOGRAPHY SUPPLIED BY DRONESCANE LIMITED, SURVEY DATE 24/01/2024
2. DRAWING COORDINATES ARE IN TERMS OF NZTM 2000
3. ALL HEIGHTS ARE IN TERMS OF NZVD 2016
4. ORIGIN OF LEVELS LINZ BENCHMARK CODE ADQ1 RL 18.550m NZVD 2016
5. SPOT HEIGHT DENSITY = 2 POINTS PER METRE (0.7m GRID) HIGHER DENSITY DATA IS AVAILABLE UPON REQUEST.
6. MINOR CONTOUR INTERVAL = 1m MAJOR CONTOUR INTERVAL = 5m
7. MHSW = APPROX +1.27m NZVD2016 MLWS = APPROX -2.7m NZVD2016

PRELIMINARY

REVISIONS	Rev'n	Date	Drawn	Issued for
1	29/01/24	RVE	PRELIMINARY	
amendments				

Survey Information
Supplied By
DRONESCANE
AERIAL PHOTOGRAPHY & TOPOGRAPHY

Drawn RVE
Checked
Traced
Approved
Date 01/24



14 Richardson Terrace
Christchurch
New Zealand

OFFSHORE & COASTAL
ENGINEERING LIMITED

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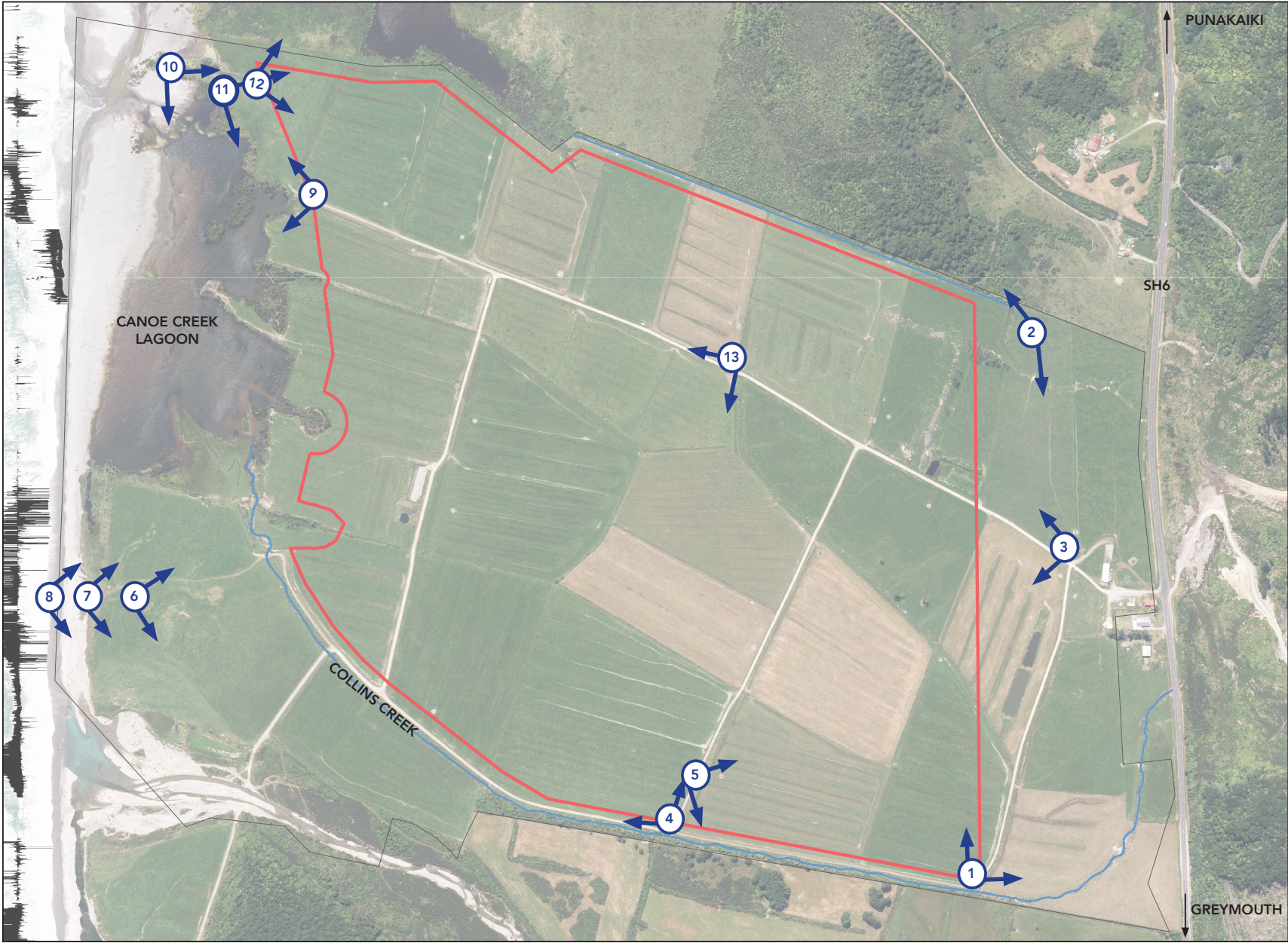
TIGa METALS AND MINERALS
BARRYTOWN SAND MINING SITE
CONTOUR PLAN

Scale (A3)	ACAD Filename
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Drawing No.	Rev.
DR-231202-004	1

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VIEWPOINTS PLAN: INSIDE THE SITE



KEY:

PRIVATE VIEWPOINT

APPLICATION SITE

MINING DISTURBANCE AREA

DRAINAGE AND WATERBODIES

Viewpoints shown on this page correspond with the panoramas shown on the following pages.

Map credits: Land Information New Zealand (LINZ) and Glasson Huxtable

GPS CO-ORDINATES:

Private viewpoint 1:

171°19'41.47"E 42°12'20.13"S

Private viewpoint 2:

171°19'45.71"E 42°11'58.15"S

Private viewpoint 3:

171°19'47.00"E 42°12'7.12"S

Private viewpoint 4:

171°19'25.28"E 42°12'17.63"S

Private viewpoint 5:

171°19'26.49"E 42°12'15.65"S

Private viewpoint 6:

171°18'55.39"E 42°12'8.06"S

Private viewpoint 7:

171°18'54.58"E 42°12'7.79"S

Private viewpoint 8:

171°18'52.13"E 42°12'7.67"S

Private viewpoint 9:

171°19'5.49"E 42°11'51.65"S

Private viewpoint 10:

171°18'57.21"E 42°11'45.67"S

Private viewpoint 11& 12:

171°18'59.75"E 42°11'46.52"S

Private viewpoint 13:

171°19'30.78"E 42°11'59.77"S

VIEWPOINT 1: THE SITE AS VIEWED FROM THE SOUTH EASTERN CORNER



Viewpoint 1: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a private viewpoint. A1 size prints to be viewed at approx. 500mm distance from eye level (recommended), A3 size prints to be viewed at approx. 250mm.

VIEWPOINT 2: THE SITE AS VIEWED FROM THE NORTH EASTERN CORNER

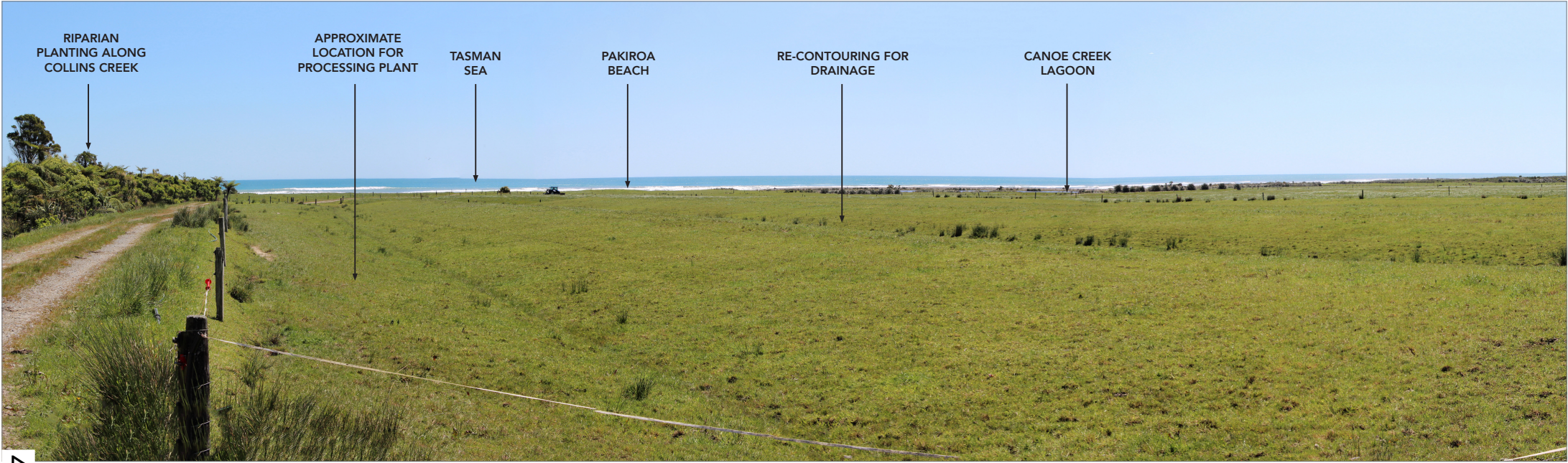


VIEWPOINT 3: LOOKING DOWN THE MAIN FARM ACCESS TRACK ON THE SITE TOWARDS THE COAST



Viewpoint 3: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a private viewpoint. A1 size prints to be viewed at approx. 500mm distance from eye level (recommended), A3 size prints to be viewed at approx. 250mm.

VIEWPOINT 4: THE SITE AS VIEWED FROM NEAR THE SOUTHERN BOUNDARY



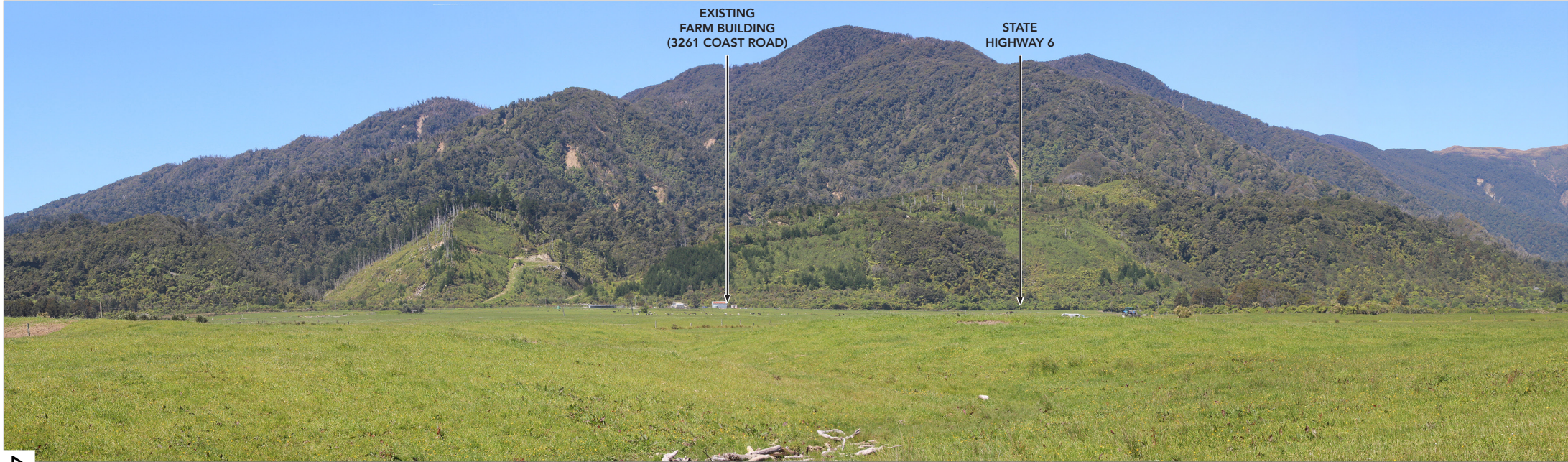
Viewpoint 4: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a private viewpoint. A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINT 5: LOOKING FROM THE SITE TOWARDS THE PAPAROA RANGES



Viewpoint 5: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a private viewpoint. A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINT 6: THE SITE AS VIEWED FROM THE SOUTH-WESTERN CORNER



Viewpoint 6: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a private viewpoint. A1 size prints to be viewed at approx. 500mm distance from eye level (recommended), A3 size prints to be viewed at approx. 250mm.

VIEWPOINT 7: LOOKING TOWARDS THE SITE FROM A DRY STREAM BED ON THE FORESHORE



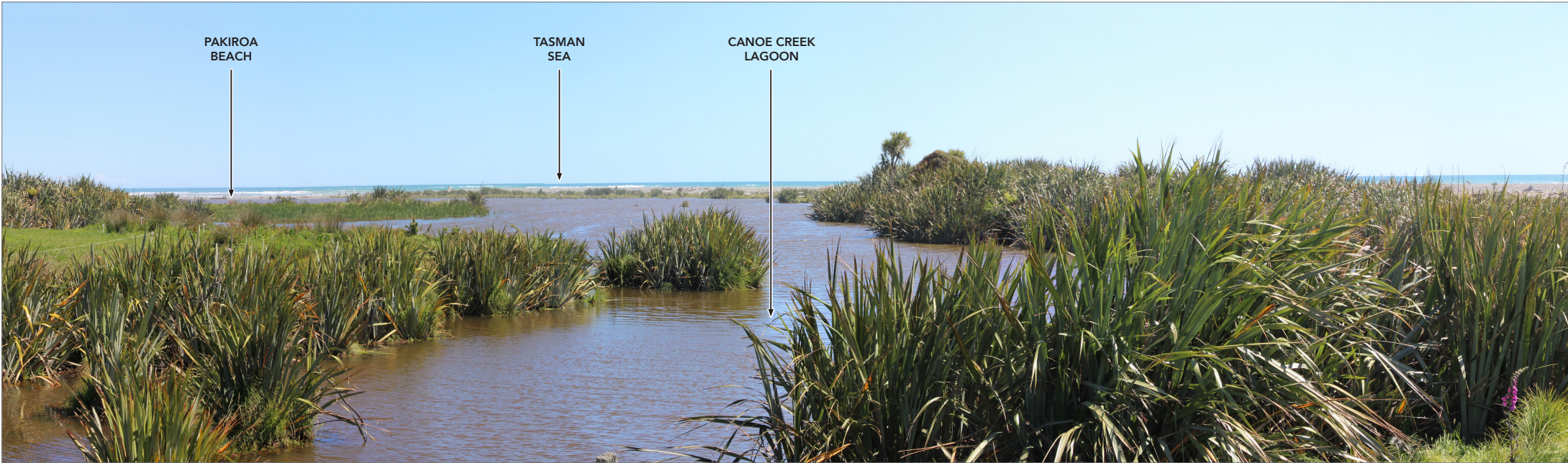
Viewpoint 7: Date taken 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a public viewpoint. A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINT 8: LOOKING TOWARDS THE SITE FROM THE HIGH TIDE MARK ON PAKIROA BEACH



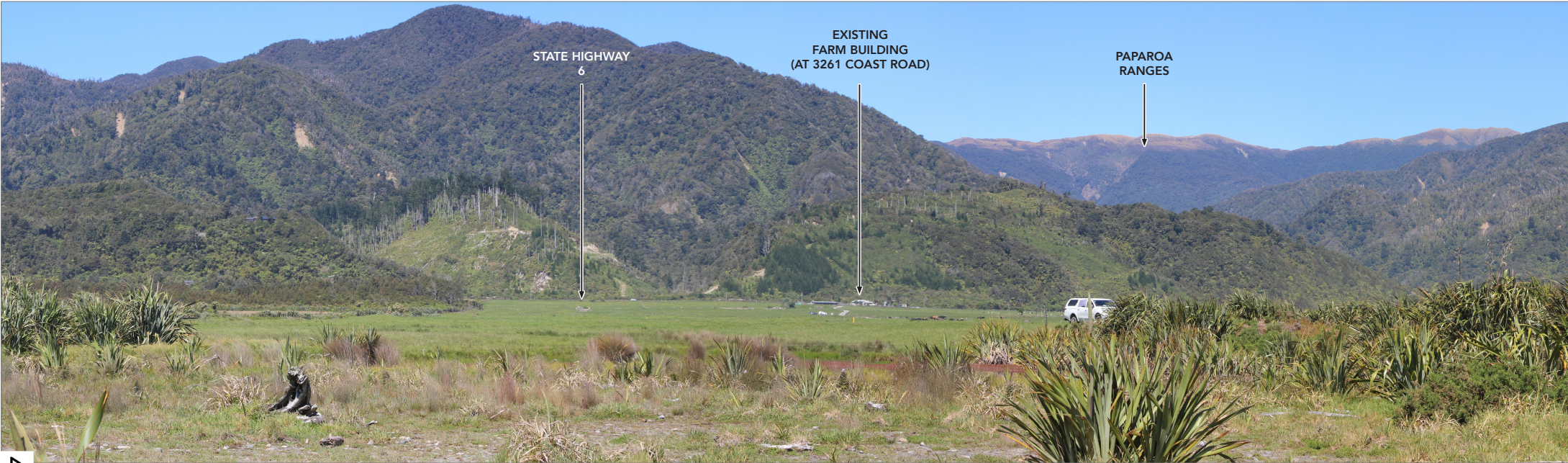
Viewpoint 8: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a public viewpoint. A1 size prints to be viewed at approx. 500mm distance from eye level (recommended), A3 size prints to be viewed at approx. 250mm.

VIEWPOINT 9: CANOE CREEK LAGOON



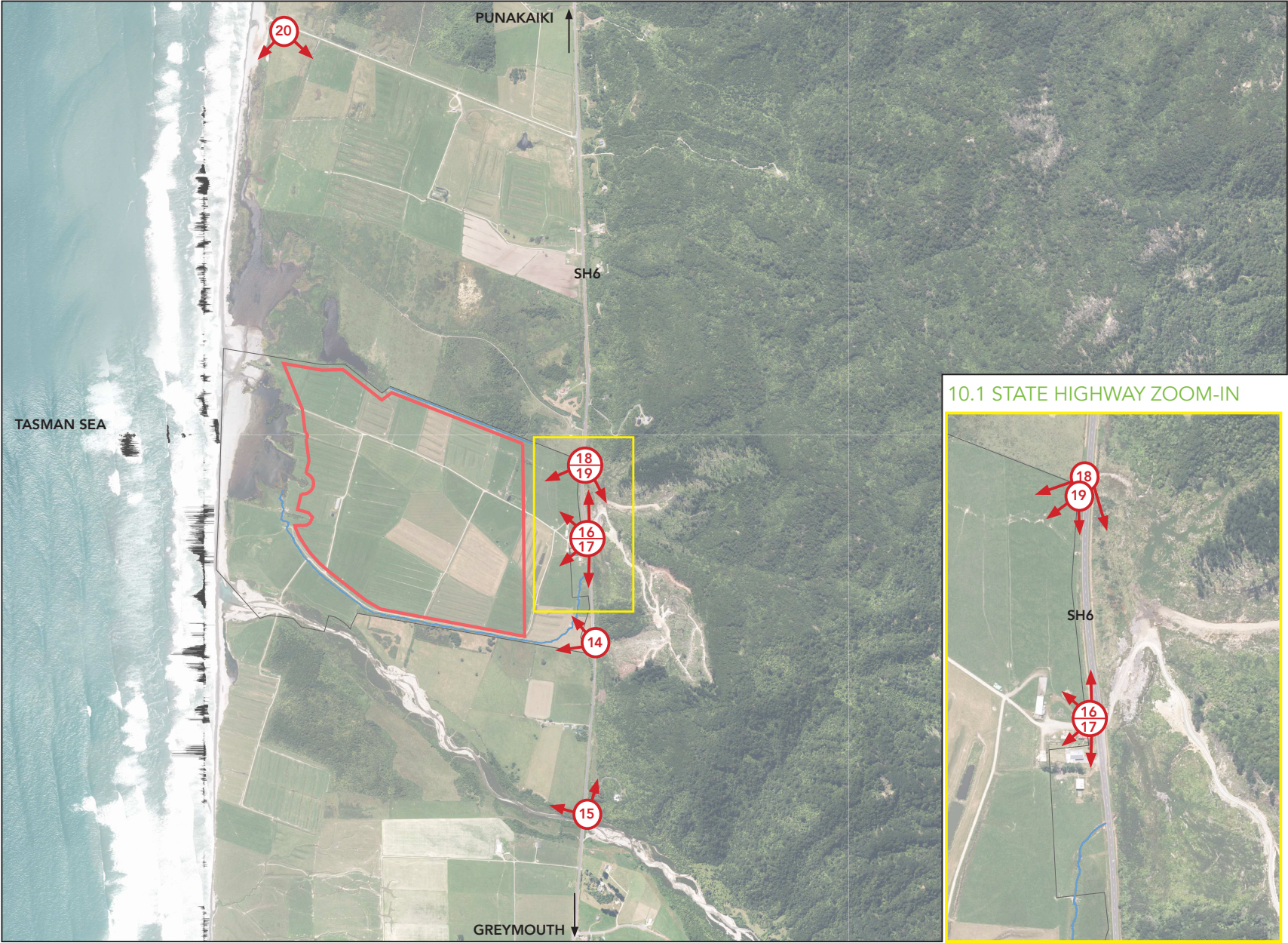
Viewpoint 9: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a private viewpoint. A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINT 10: LOOKING TOWARDS THE SITE AND THE PAPAROA RANGES FROM PAKIROA BEACH



Viewpoint 10: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a public viewpoint. A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINTS PLAN: OUTSIDE THE SITE



KEY:

- PUBLIC VIEWPOINT
- ZOOM-IN
- APPLICATION SITE
- MINING DISTURBANCE AREA
- DRAINAGE AND WATERBODIES

Viewpoints shown on this page correspond with the panoramas shown on the following pages.

Map credits: Land Information New Zealand (LINZ) and Glasson Huxtable

GPS CO-ORDINATES:

Public viewpoint 14:
171°19'52.95"E 42°12'19.60"S

Public viewpoint 15:
171°19'51.33"E 42°12'38.51"S

Public viewpoint 16 & 17:
171°19'51.14"E 42°12'3.63"S

Public viewpoint 18 & 19:
171°19'51.59"E 42°11'57.07"S

Public viewpoint 20:
171°19'3.02"E 42°11'5.61"S

GPS CO-ORDINATES DISTANCES FROM SITE:

Public viewpoint 14: 0.01km
 Public viewpoint 15: 0.54km
 Public viewpoint 16 & 17: 0.01km
 Public viewpoint 18 & 19: 0.01km
 Public viewpoint 20: 1.25km

VIEWPOINT 14: VIEW FROM SH6, LOOKING NORTH WEST ACROSS THE SITE



Viewpoint 14: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a public viewpoint. A1 size prints to be viewed at approx. 500mm distance from eye level (recommended), A3 size prints to be viewed at approx. 250mm.

VIEWPOINT 15: VIEW FROM THE DRIVEWAY OF 3172 COAST ROAD, SOUTHERN APPROACH TO THE SITE



Viewpoint 15: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a public viewpoint. A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINT 16: VIEW FROM SH6, LOOKING NORTH-WEST (SITE IN FOREGROUND)



Viewpoint 16: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a public viewpoint. A1 size prints to be viewed at approx. 500mm distance from eye level (recommended), A3 size prints to be viewed at approx. 250mm.

VIEWPOINT 17: VIEW FROM SH6, LOOKING SOUTH-WEST AT THE SITE



Viewpoint 17: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a public viewpoint. A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINT 18: VIEW FROM SH6 ILLUSTRATING THE NORTHERN APPROACH TO SITE



Viewpoint 18.0: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a public viewpoint. A1 size prints to be viewed at approx. 500mm distance from eye level (recommended), A3 size prints to be viewed at approx. 250mm.

VIEWPOINT 19: VIEW FROM SH6 ILLUSTRATING THE NORTHERN APPROACH TO SITE



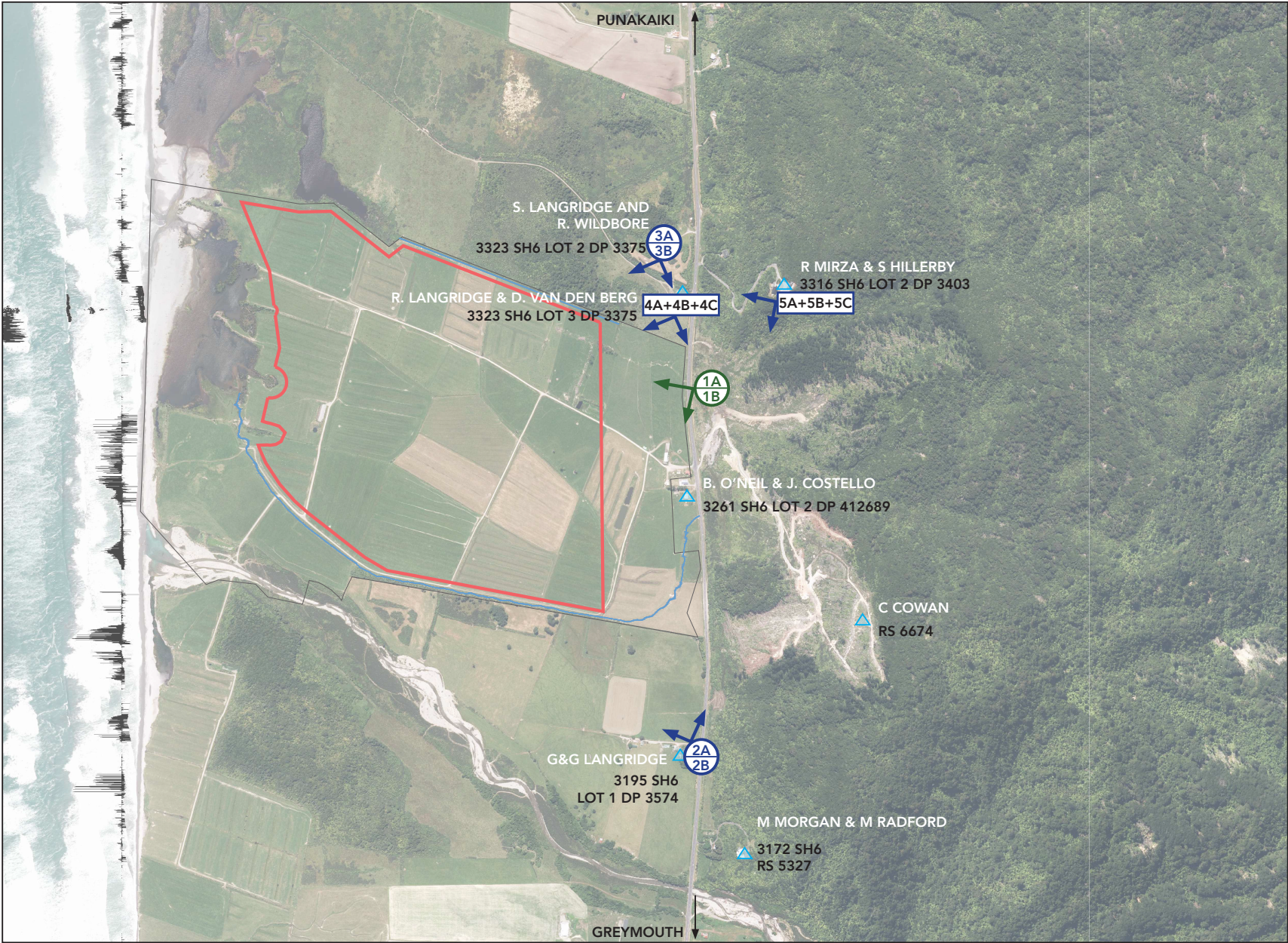
Viewpoint 19.0: Date taken: 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a public viewpoint. A1 size prints to be viewed at approx. 500mm distance from eye level (recommended), A3 size prints to be viewed at approx. 250mm.

VIEWPOINT 20: LOOKING TOWARDS THE SITE FROM THE NORTH WESTERN END OF BURKE ROAD



Viewpoint 20.0: Date taken 14th November 2022. Taken with a Canon 600D camera with a 50mm lens. This is a public viewpoint. A1 size prints to be viewed at approx. 500mm distance from eye level (recommended), A3 size prints to be viewed at approx. 250mm.

VIEWPOINT PLAN - FOR LOCATIONS OF VISUAL SIMULATIONS



KEY:

- APPLICATION SITE
- MINING DISTURBANCE AREA
- NEIGHBOURING PROPERTIES
- DRAINAGE AND WATERBODIES
- PUBLIC VIEWPOINT FROM SH6
- PRIVATE VIEWPOINTS 2-5

NOTE: Visual simulations for each of the identified viewpoints are included on the following pages.

State Highway 6 and Coast Road are synonymous.

Many property owners possess more than one parcel of land. The supplied parcel numbers on the plan relate to the dwelling associated with each address.

GPS CO-ORDINATES:

Public Viewpoint 1A and 1B:
42°11'59.81"S 171°19'51.63"E

Private Viewpoint 2A and 2B:
42°12'31.01"S 171°19'50.30"E

Private Viewpoint 3A and 3B:
42°11'50.75"S 171°19'48.35"E

Private Viewpoint 4A, 4B and 4C:
42°11'54.95"S 171°19'49.78"E

Private Viewpoint 5A, 5B and 5C:
42°11'54.44"S 171°20'0.67"E

DISTANCES FROM SITE:

3172 SH6: 0.54km
3195 SH6: 0.27km
3261 SH6: 0.00km
3316 SH6: 0.25km
3375 SH6: 0.10km
3323 SH6: 0.10km/0.22km

Map credits: Land Information New Zealand (LINZ) and Glasson Huxtable Ltd

VIEWPOINT 1A: THE EXISTING SITE AS VIEWED FROM STATE HIGHWAY 6



Viewpoint 1A: Existing

Location: This is a public viewpoint as viewed from the eastern shoulder of SH6 facing south-west towards the site and bund, 11.5m from the site boundary.

Date: Photos were taken to compile the panorama on the 24th of May 2023

Camera: Canon 600D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINT 1B: VISUAL SIMULATION OF THE PROJECT AS VIEWED FROM SH6



Viewpoint 1B: Proposed

Location: This is a public viewpoint as viewed from the eastern shoulder of SH6 facing south-west towards the site and bund, 11.5m from the site boundary.

Date: Photos were taken to compile the panorama on the 24th of May 2023

Camera: Canon 600D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

Observations:

- A new 1.8m high bund has been placed inside the eastern boundary of the site.
- New native planting has been added to the eastern side of the bund and on top.
- Planting assists to screen the Processing Plant and mining activity from view.
- The simulation is shown at 3 years post planting (year 5 of the project, year 3 of mining).
- Planting is illustrated at between 1.6m and 2.4m in height.

VIEWPOINT 2A: THE EXISTING SITE AS VIEWED FROM 3195 COAST ROAD (G AND G LANGRIDGE)



Viewpoint 2A: Existing

Location: This is a private viewpoint as viewed from 3195 Coast Road (G&G Langridge) facing north towards Collin Creek.

Date: Photos were taken to compile the panorama on the 24th of May 2023

Camera: Canon 600D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINT 2B: VISUAL SIMULATION OF THE PROJECT AS VIEWED FROM 3195 COAST ROAD (G AND G LANGRIDGE)



Viewpoint 2B: Proposed

Location: This is a private viewpoint as viewed from 3195 Coast Road (G&G Langridge) facing north towards Collin Creek.

Date: Photos were taken to compile the panorama on the 24th of May 2023

Camera: Canon 600D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

- Observations:
- A few remnant kahikatea trees within the site have been removed.
 - The new 4.5m high central stockpile bund is visible running across the site with planting around its southern end.
 - Mitigation planting along Collins Creek is also visible with the new access road behind.
 - The new Processing Plant and ancillary facilities can be seen to the left of the image.
 - The simulation is shown at 3 years post planting (year 5 of the project, year 3 of mining).
 - Planting is illustrated at between 1.6m and 2.4m in height.

VIEWPOINT 3A: THE EXISTING SITE AS VIEWED FROM 3323 COAST ROAD (S LANGRIDGE AND R WILDBORE)



Viewpoint 3A: Existing

Location: This is a private viewpoint as viewed from 3323 Coast Road (S Langridge and R Wildbore) facing south towards the site.

Date: Photos were taken to compile the panorama on the 24th of May 2023

Camera: Canon 600D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINT 3B: VISUAL SIMULATION OF THE PROJECT AS VIEWED FROM 3323 COAST ROAD (S LANGRIDGE AND R WILDBORE)



Viewpoint 3B: Proposed

Location: This is a private viewpoint as viewed from 3323 Coast Road (S Langridge and R Wildbore) facing south towards the site.

Date: Photos were taken to compile the panorama on the 24th of May 2023

Camera: Canon 600D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

- Observations:
- The Processing Plant and tanks are visible.
 - The new 4.5m high central stockpile bund is visible running across the site.
 - Retaining the flax in the middle of the image helps to provide some screening.
 - Mitigation planting along the north-eastern boundary is also visible.
 - The simulation is shown at 3 years post planting (year 5 of the project, year 3 of mining).
 - Planting is illustrated at between 1.6m and 2.4m in height.

VIEWPOINT 4A: THE EXISTING SITE AS VIEWED FROM 3323 COAST ROAD (R LANGRIDGE AND D VAN DER BERG)



Viewpoint 4A: Existing

Location: This is a private viewpoint as viewed from 3323 Coast Road (R Langridge and D Van derberg) facing south towards the site. Image was taken from a step stool (at owners request) to replicate the floor height of looking out at the view from their house bus.

Date: Photos were taken to compile the panorama on the 24th of May 2023

Camera: Canon 600D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINT 4B: VISUAL SIMULATION OF THE PROJECT AS VIEWED FROM 3323 COAST ROAD (R LANGRIDGE AND D VAN DER BERG)



Viewpoint 4B: Proposed - With New North-Eastern Boundary Planting

Location: This is a private viewpoint as viewed from 3323 Coast Road (R Langridge and D Van derberg) facing south towards the site. Image was taken from a step stool (at owners request) to replicate the floor height of looking out at the view from their house bus.

Date: Photos were taken to compile the panorama on the 24th of May 2023

Camera: Canon 600D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

- Observations:
- The tallest part of the new Processing Plant is visible.
 - The new 4.5m high central stockpile bund can be seen running across the site with the top of machinery visible behind the bund.
 - Retaining the flax in the middle of the image helps to provide some screening.
 - Mitigation planting along the north-eastern boundary is present and screens trucks using the access road from view.
 - The simulation is shown at 3 years post planting (year 5 of the project, year 3 of mining).
 - Planting is illustrated at between 1.6m and 2.4m in height.



Viewpoint 4C: Proposed - Without North-Eastern Boundary Planting

Location: This is a private viewpoint as viewed from 3323 Coast Road (R Langridge and D Van derberg) facing south towards the site. Image was taken from a step stool (at owners request) to replicate the floor height of looking out at the view from their house bus.

Date: Photos were taken to compile the panorama on the 24th of May 2023

Camera: Canon 600D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

- Observations:**
- The tallest part of the new Processing Plant is visible.
 - The new 4.5m high central stockpile bund can be seen running across the site with the top of machinery visible behind the bund.
 - Retaining the flax in the middle of the image helps to provide some screening.
 - Without mitigation planting along the north-eastern boundary, trucks using the access road will be visible.
 - The simulation is shown at 3 years post planting (year 5 of the project, year 3 of mining).
 - Planting is illustrated at between 1.6m and 2.4m in height.

VIEWPOINT 5A: THE EXISTING SITE AS VIEWED FROM 3316 COAST ROAD (R MIRZA AND S HILLERBY)



Note: The base image for Viewpoints 5A, 5B and 5C is provided by Mr Girvan from Boffa Miskell and used with permission.

Viewpoint 5A: Existing

Location: This is a private viewpoint as viewed from 3316 Coast Road (R Mirza and S Hillerby) facing west towards the site.

Date: Photo was taken by Mr Girvan (of Boffa Miskell) on the 24th of May 2023 (and used with permission).

Camera: Canon EOS 6D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

VIEWPOINT 5B: VISUAL SIMULATION OF THE EXISTING SITE AS VIEWED FROM 3316 COAST ROAD (R MIRZA AND S HILLERBY)



Viewpoint 5B: Proposed - In Year 3 of Mining

Location: This is a private viewpoint as viewed from 3316 Coast Road (R Mirza and S Hillerby) facing west towards the site.

Date: Photo was taken by Mr Girvan (of Boffa Miskell) on the 24th of May 2023 (and used with permission).

Camera: Canon EOS 6D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

- Observations:**
- The Processing Plant, ancillary buildings and new access road is not visible.
 - Part of the new 4.5m high central stockpile bund with temporary stockpiles behind can be seen running across the site.
 - The new triangular shaped Clean Water Facility (CWF) ponds can be seen.
 - New wetland planting is visible around Canoe Creek Lagoon and in-between the Lagoon and the Clean Water Facility.
 - A small amount of new planting along the northern drain is also visible.
 - The simulation is shown at 3 years post planting (year 5 of the project, year 3 of mining).
 - Planting is illustrated at between 1.6m and 2.4m in height.
 - The foreground vegetation in the photo (within the private property) is likely to increase in height and may screen views towards the mine site. However, as this has not been relied upon, it is not shown in the visual simulation.



Viewpoint 5C: Proposed - In Year 5 of Mining (Worse Case Scenario)

Location: This is a private viewpoint as viewed from 3316 Coast Road (R Mirza and S Hillerby) facing west towards the site.

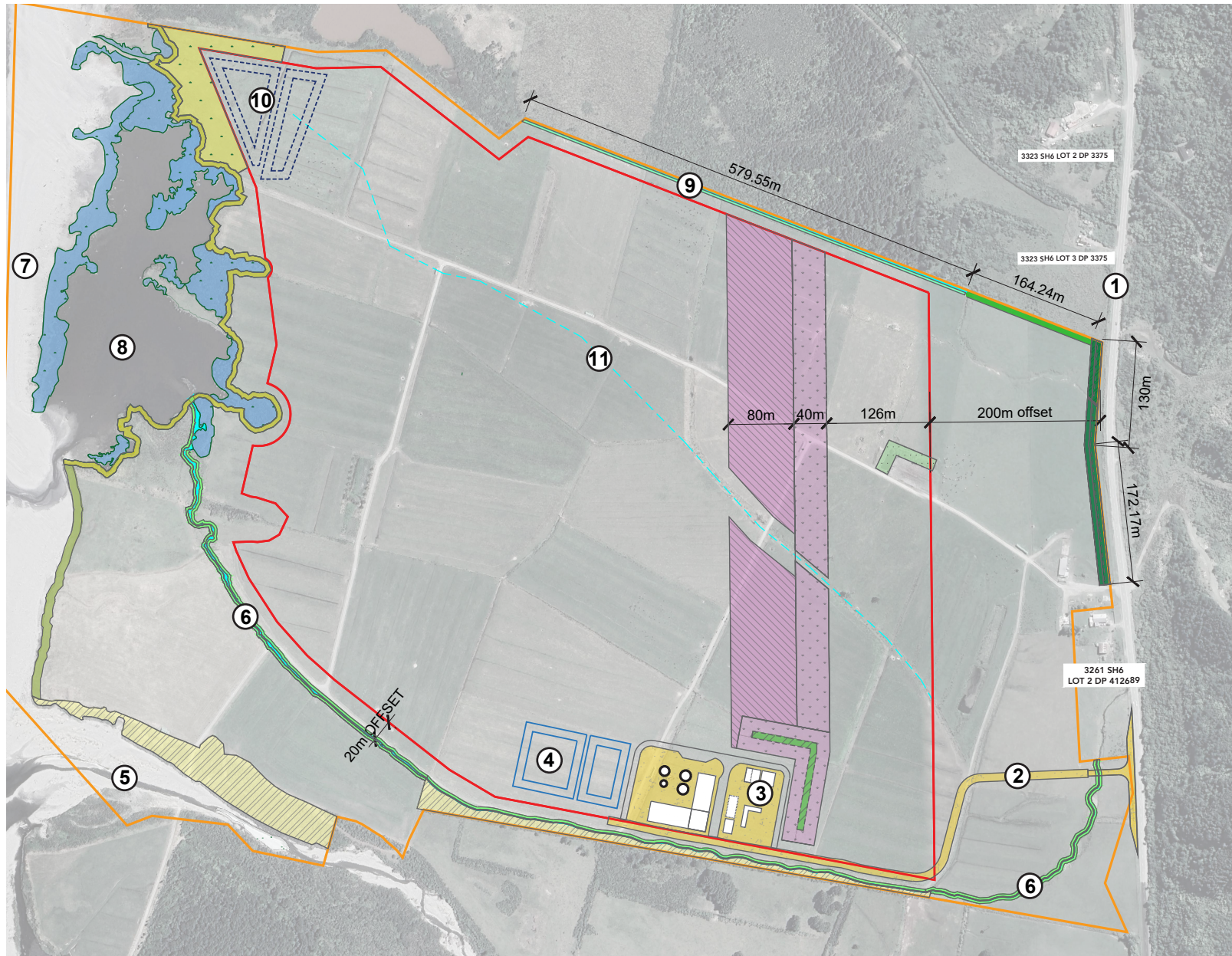
Date: Photo was taken by Mr Girvan (of Boffa Miskell) on the 24th of May 2023 (and used with permission).

Camera: Canon EOS 6D camera with a 50mm lens.

Viewing Distance: A1 size prints should be viewed at approx. 500mm distance from eye level (recommended), A3 size prints should be viewed at approx. 250mm.

- Observations:**
- The Processing Plant, ancillary buildings and new access road is not visible.
 - Part of the new 4.5m high central stockpile bund with temporary stockpiles behind can be seen running across the site.
 - The new triangular shaped Clean Water Facility (CWF) ponds can be seen.
 - New wetland planting is visible around Canoe Creek Lagoon and in-between the Lagoon and the Clean Water Facility.
 - A small amount of new planting along the northern drain is also visible.
 - A 300m x 100m mining area is also shown to indicate what an operational area would appear like from this viewpoint. This has been triple-checked for accuracy in terms of representative size and shape.
 - The simulation is shown at 5 years post planting (year 7 of the project, year 5 of mining).
 - Planting is illustrated at between 1.6m and 2.4m in height.
 - The foreground vegetation in the photo (within the private property) is likely to increase in height and may screen views towards the mine site. However, as this has not been relied upon, it is not shown in the visual simulation.

GENERAL LAYOUT PLAN



LEGEND

- Bund Type A : 1.8m high Eastern Bund - Planted on eastern face and top
- Bund Type B: Planted on top of Central Stockpile Bund
- Ore Stockpile Area
- Bund Type B: 4.5m high Central Stockpile Bund - Grassed
- Coastal Mitigation Planting: (10m wide)
- Wetland Mitigation Planting (6m wide)
- Clean Water Facility (CWF) Planting
- Riparian Planting Types A, B and C: Along Collins Creek (min. 3m wide one/two sides)
- Riparian Planting Type D: Planting along Northern Drain southern side (3m wide)
- Neighbouring Mitigation Planting (8m wide - if required)
- Existing Wetland Planting
- Internal Access Road and Hardstand
- Existing Stand of Flax to be retained
- Existing Riparian Planting
- Mining Disturbance Area
- Application Site

KEY

- ① State Highway 6 / Coast Road
- ② Internal Access Road and Hardstand
- ③ Processing Plant and Associated Facilities
- ④ Mine Water Facility: Pond 1 and 2
- ⑤ Canoe Creek
- ⑥ Collins Creek
- ⑦ Pakiroa Beach
- ⑧ Canoe Creek Lagoon
- ⑨ Existing Northern Drain
- ⑩ Clean Water Facility and Future Wetland Extension
- ⑪ New Central Drain

1:5,000

0 50 100 200 300 400 500M



LANDSCAPE PLANT SPECIES AND INDICATIVE GROWTH RATES

Below are the plant species that will be used for mitigation planting.

- An approximate growth rate of 0.40-0.60m per year has been determined in consultation with the project Landscape Architect [Mrs Crawford] and project Ecologist [Mr Bramley]. The combined experience of these two individuals notes that these plants will sit at a lower growth rate for the first two years following planting, and will have an increase in growth rates in following years. It is also noted that larger individual specimens have a longer 'sitting' period than smaller ones.
- Growth rates can be influenced by seasonal fluctuations, maintenance, moisture/precipitation, exposure, ground conditions, and type of plant species.

Note: The plant species proposed to be used are shown in Schedule of Species below, although other similar species may be used in addition to those listed (e.g., if a particular species is unavailable to source or if for any reason a species is deemed unsuitable at a later stage).

PLANT GROWTH

PROJECT YEAR	MINE STAGE	NATIVE PLANT HEIGHT
1	-	Seed Collection
2	-	0.4 - 0.6m at planting
3	1	0.8 - 1.2m
4	2	1.2 - 1.8m
5	3	1.6 - 2.4m
6	4	2.0 - 3.0m
7	5	2.4 - 3.6m
8	6	2.8 - 4.2m
9	7	3.2 - 4.8m

SCIENTIFIC NAME	COMMON NAME	BUND	RIPARIAN	WETLAND	COASTAL	ULTIMATE SIZE (m) wch
<i>Aristotelia serrata</i>	makomako, wineberry	x	x			3 x 6
<i>Carex geminata</i>	rautahi		x	x		1x1
<i>Carex secta</i>	purei		x	x		1.5 x1.5
<i>Carex virgata</i>	pukio		x	x		0.5 x 1
<i>Coprosma propinqua</i>	mikimiki	x	x	x		2.5 x 5
<i>Coprosma robusta</i>	karamu	x	x	x		2.5 x 5
<i>Cordyline australis</i>	tī kouka, cabbage tree	x	x	x		2 x 6
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine		x	x		5 x 50
<i>Juncus edgariae</i>	edgar's rush		x	x		1 x 1
<i>Metrosideros robusta</i>	northern rata		x	x		3 x 15
<i>Melicytus ramiflorus</i>	māhoe, whiteywood	x	x			2.5 x 8
<i>Phormium tenax</i>	harakeke, korari, New Zealand flax	x	x	x	x	2 x 3
<i>Pittosporum eugenoides</i>	tarata, lemonwood	x	x			3 x 6
<i>Pittosporum tenuifolium</i>	kohuhu	x	x			3 x 6
<i>Typha orientalis</i>	raupō, bull rush			x		1.5 x 2.3

INDICATIVE STAGING PLAN

Below is an indicative staging plan.

* Bund Type A will need to be planted from established nursery plants, not from seed collected.

** Planting time periods can be condensed if necessary depending on the availability of landscape contractors and plants.

	LANDSCAPE PREPARATION AND ESTABLISHMENT										**	ACTIVE MINING								REHABILITATION		
	Year	2023	2024				2025					2026	2027	2028	2029	2030	2031	2032		2033	2034	2035
	Consent Term	Year0	Year 1	Q2	Q3	Q4	Year 2	Q2	Q3	Q4		Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9		Year 10	Year 11	Year 12
Planting Plans																						
Nursery EO1																						
Tender Package																						
Nursery Contract Confirmed																						
Plant Seed Collected																						
Propogation/Growing of Plants																						
Confirmation of Suitable Plants																						
Planting Bund Type A*																						
Planting - Collins Creek																						
Planting - Canoe Creek Lagoon																						
Planting - Northern Neighbour																						
Planting - Coastal																						
Planting - Northern Drain																						
Planting - Bund Type B																						
Planting - CWF																						
Landscape Maintenance During Mining																						
Planting - Enrichment																						
End of Mining - Rehabilitation																						
Planting - CWF Wetland Extension																						
Removal of Stockpile Bund Planting																						

RECOMMENDED EXTERIOR COLOUR PALETTE

One of these Colorcote swatches will be chosen for the exterior (cladding and roofing) of the Processing Plant and ancillary buildings with the site. This will help structures to be viewed as a recessive colour against the background environment.



Recommended colours against views from road (majority).

ColorCote Colour	Hex Value:	LRV*:
Permanent Green	#495d50	10.66%
Rivergum	#6a776a	18.13%
Mudstone	#656663	16.08%
Ironsand	#545250	9.55%



Recommended colours against views from the beach (minority).

ColorCote Colour	Hex Value:	LRV*:
Permanent Green	#495d50	10.66%
Rivergum	#6a776a	18.13%
Mudstone	#656663	16.08%
Ironsand	#545250	9.55%