



# Bay of Plenty Regional Council

## Koapeopeo Canal Remediation

### CLG Monthly Update Report

January 2019

# Executive summary

Dredging was on hold during January 2019 while the water treatment plant was moved from CS1 to CS3 in preparation for dredging recommencement in early February. There was no monitoring or validation sampling undertaken during this period as no sediment was being dredged and focus was on setting up equipment for dredging Section 6 of the canal.

The majority of equipment was removed from CS1 and the site is in need of further tidying and cleaning. The cell at CS1 is dry and the sediment spilled in the cell needs to be contained within the Geobags ahead of the cell closure. The bioremediation team has been inoculating some of the Geobags in CS1 with fungus to start the bioremediation process.

The water treatment plant and office space was moved to CS3 and the pipeline has been laid out to the containment cell.

An articulated forklift (Merlo) overturned into the canal in late January 2019. No one was injured in the accident and WorkSafe New Zealand was notified. An investigation is currently underway by the EnviroWaste Services Limited (ESL) and will be reported on once it is provided to the Independent Monitor (IM).

Dredging will resume in early February. While an extended 14 hour dredging day has been discussed, the contractor is yet to implement this. This change would need to comply with Bay of Plenty Regional Council Resource Consent 67173-AP Condition 33 – Hours of Work. As such, any dredging outside 7 am to 6 pm must not occur within 150 metres of a residential dwelling and must comply with NZS 6803:1999 Acoustics – Construction Noise.

Of the consent conditions in Bay of Plenty Regional Council Resource Consent 67173-AP that were checked by the IM field observer, the Consent Holder may be in breach of Condition 40.1 due to there being sediment within CS1 that is not being kept wet.

February 2019 will see dredging begin in Section 6.

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# 1. Introduction

## 1.1 Introduction

The Kopeopeo Canal is situated on the outskirts of Whakatane, in the Bay of Plenty, New Zealand. The Kopeopeo Canal Remediation Project (KCRP) is a joint venture between Bay of Plenty Regional Council (BoPRC) and central government (Ministry for the Environment (MfE)) in an effort to restore the canals ability to transfer water and to remediate dioxin contamination caused by historic discharges from an adjacent sawmill. The project area is 5.1 km in length between the Kopeopeo and Orini canal confluence and the intersection of State Highway 30 (SH30) and Kope Drain Road (Appendix A).

The Independent Monitor (IM), Andrew Kohlrusch, and Independent Monitor Field Observer, Matt James, provide independent feedback, assistance, and monitoring to the project management team, contractors working on site, and community through the Community Liaison Group (CLG). The objective of this relationship is to continue to build trust between the Whakatane community and the project team, provide independent feedback to the community, and allow the project team to access the extensive technical experience of the IM.

This report is part of the requirements outlined in the Bay of Plenty Regional Council Resource Consent 67173-AP Condition 6 – Independent Monitor.

## 1.2 Purpose

The purpose of the CLG Monthly Update Report (January 2019) is to provide an independent summary of the progress of the Kopeopeo Canal Remediation Project. The CLG Monthly Update Report (January 2019) is commissioned by Bay of Plenty Regional Council for distribution to the CLG and Whakatane community.

## 1.3 Limitations

This report has been prepared by GHD for Bay of Plenty Regional Council (BoPRC) and may only be used and relied on by Bay of Plenty Regional Council for the purpose agreed between GHD and Bay of Plenty Regional Council as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Bay of Plenty Regional Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

GHD has prepared this report on the basis of information provided by Bay of Plenty Regional Council and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The IM and IM field observer are not providing commentary or observations on matters related to project team (or subcontractor) health and safety as part of the IM role for the Kopeopeo Canal Remediation Project.

## 2. Project Progress

### 2.1 CS1

The following summarises the project events at CS1 during January 2019 (Refer to photographs in Table 1: Photograph Progress Log):

- Christmas shutdown completed on 7 January 2019.
- Dredging has been completed in Section 5.
- Bioremediation at CS1 has been ongoing with wood chip being pumped into the bags (Photograph 1). The bioremediation team have then been inoculating the bags with fungus (Photographs 14 to 16).
- The containment cell is awaiting cleaning and closure (Photographs 8, 9, 17, & 18). Dry sediment is sitting within the containment cell (Photograph 17).
- Oversized material bulk bags are awaiting a lift into the containment cell.
- Equipment is being moved from CS1 to CS3 (Photograph 2).

### 2.2 CS3

The following summarises the events at CS3 during January 2019 (Refer to photographs in Table 1: Photograph Progress Log):



- The CS3 cell is being flooded with rainwater to minimise risk of wind damage to the HDPE liner.
- The water treatment plant and associated equipment is being set up at CS3 in preparation for dredging to commence on 11 February 2019 (Photographs 5, 6 & 11).




### 2.3 Project Area

The following summarises the project events across the wider project area during January 2019 (Refer to photographs in Table 1: Photograph Progress Log):

- Keepa Road was closed for a brief period in early January. This closure was not associated with the KCRP (Photograph 4).
- The dredge was moved into the start of Section 6 in preparation for dredging to commence in February 2019.
- A crane removed the Shaw Road boost pump (Photograph 10).
- The Paroa Road boost pump remains in place. The liquid in the bund beneath the fuel tank will require sucker truck removal before it can be moved (Photograph 12 & 13).
- An articulated forklift (Merlo) overturned into the Kopeopeo Canal on 22 January 2019. (Photographs 19 – 25). Two cranes were used to remove the vehicle and no one was injured. An investigation is ongoing and will be reported on once it is provided to the IM.
- Due to the need to maintain a constant water level to move equipment along the canal, both flood control structures (FCS) were largely left closed.
- On-going discussion between project team, consent authority and IM to manage turbidity releases from the project area. Turbidity releases are being monitored through a combination of manual water sampling and live turbidity measurements.

Table 1: Photograph Progress Log

Photograph	Event
	<p>Photograph 1: Loading wood pellet into the Geobags ahead of bioremediation.</p>
	<p>Photograph 2: Moving equipment from CS1 to CS3.</p>

Photograph	Event
	<p>Photograph 3: CS1 containment cell in mid-January awaiting clean up.</p>
	<p>Photograph 4: Keepa Road closure. Closure was not due to KCRP.</p>
	<p>Photograph 5: Equipment being placed at CS3.</p>



Photograph

Event



Photograph 6: Water treatment plant tanks being placed at CS3.



Photograph 7: Installation of monitoring and electrical equipment at CS3.



Photograph 8: CS1 during equipment move.

Photograph

Event



Photograph 9: CS1 containment cell.



Photograph 10: Crane removing the Shaw Road boost pump.



Photograph 11: Crane moving tanks at CS3.

Photograph

Event



Photograph 12: Boost pump at Paroa Road awaiting removal.



Photograph 13: Water in the bund beneath the fuel tank of the Paroa Road boost pump requiring sucker truck removal.



Photograph 14: Bioremediation team inoculating Geobags at CS1.

Photograph

Event



Photograph 15:  
Bioremediation team showing the thickness (5 to 15 cm) of the wood pellet layer on the top of the Geobags.



Photograph 16:  
Inoculated Geobag with CS1.



Photograph 17: CS1 sump awaiting clean up. Note the dry sediment within the containment cell as water levels are very low.

Photograph

Event



Photograph 18: CS1 water treatment area awaiting clean up.



Photograph 19: Merlo overturned in the canal near Keepa Road on 22 January 2019.



Photograph 20: Merlo overturned in the canal near Keepa Road on 22 January 2019.

Photograph

Event



Photograph 21: Building of a temporary stable pad for the cranes to sit on while lifting the Merlo.



Photograph 22: Cranes setting up for lift.



Photograph 23: Cranes lifting the Merlo out of the canal.

Photograph

Event



Photograph 24: Merlo having been placed on the canal bank.



Photograph 25: Crane lifting a section of the sediment transfer pipe out of the canal.

## 3. Community Liaison Group Update

### 3.1 Community Concerns

A CLG meeting was not held during January 2019. The next scheduled CLG meeting is for 26 February 2019.

The project complaints register for January 2019 was reviewed by the IM. Further detail is provided in Section 4.12.



## 4. IM Inspection Summary

This section outlines the observations made during the site inspections undertaken by the IM field observer during January 2019.

### 4.1 Vegetation Clearing, Fauna, Topsoil Management and Rehabilitation & Visual Amenity

#### 4.1.1 Project Area

Topsoil had been disturbed in the areas where the two boost pumps were located adjacent to Shaw Road and Paroa Road. The Shaw Road boost pump has been removed. Both areas are adequately vegetated and do not pose a dust risk.

#### 4.1.2 CS1

CS1 requires tidy up and cleaning ahead of closure. The Principal Contractor (ESL) has stated that this clean up will be completed by the end of February 2019.

#### 4.1.3 CS3

CS3 is currently being set up with equipment for the water treatment plant. It will need to be kept in a tidy and safe state.

### 4.2 Drainage, Sediment & Water Management

#### 4.2.1 Project Area

Flood control structures at the eastern and western ends of the KCRP area are used to maintain optimal water levels for dredging and consent requirements. Due to the need to maintain a constant water level to move equipment along the canal, both flood control structures (FCS) were largely left closed.

The checks of the FCS and side culverts are reported as part of the Flood Management Situation Report prepared by the deputy project manager on a daily basis during dredging as part of the requirements outlined in the Bay of Plenty Regional Council Resource Consent 67173-AP Condition 7 – Flood Management. During January 2019, the Flood Management Situation Report was sent out weekly as no dredging took place. The Flood Management Situation Report is emailed to the following parties:

- BOPRC flood managers and consent authority
- Whakatane District Council
- Kopeopeo Canal Remediation Project site managers and site engineers
- Kopeopeo Canal Remediation Project administrator and contractors
- IM field observer
- BOPRC compliance officer

#### 4.2.2 CS1

Small volumes of sediment have been spilled in the containment cell multiple times over the last 12 months and on each occasion; the IM and project team have both requested that this material be cleaned up. As the cell floor has been covered with water during the filling of the Geobags in CS1, the generation of dust was not likely. However, as January had very low

rainfall, the layer of water that was in the base of the containment cell has evaporated. Beneath this layer of water is a layer of contaminated sediment approximately 1 to 20 cm thick that has accumulated over the previous 12 months. While this material constitutes a minor portion of the total sediment volume safely deposited within the Geobags, it has dried out and as such, this may breach Bay of Plenty Regional Council Resource Consent 67173-AP Condition 40.1 which states that sediment must be kept wet until the time it is covered and stabilised. It is acknowledged that this consent condition was created to manage the dust generation risk under the originally consented excavate and truck method, and as the material is wet pumped directly into the Geobags it has largely been superseded. The condition is beneficial however in that it provides a control to mitigate potential risks of dry sediment in the containment cell being released to the environment in windy conditions. Recent inspections of the material in the base of the cell by the IM field observer did note that it has a hard crust that made it unlikely to generate dust, even in windy conditions. There has been no observed dust released as a result of wind action and there has been no regular site work at CS1.

The IM has issued a request to the project team and the principal contractor asking for the material to be cleaned up or covered with water again. The IM also raised the dust generation risk for any workers involved in the clean up. The material should be disturbed only once it has been dampened. The cell is being cleaned using water and brooms with the material being recirculated into the Geobags and contained.

#### 4.2.3 CS3

Rainfall is collected in CS3 and discharged when necessary into the Kopeopeo Canal. The cell is kept in a semi-flooded state to add weight to the liner in the event of strong winds. No contaminated sediment has been placed into the cell.

### 4.3 Dust Management

#### 4.3.1 CS1

No nuisance-dust monitoring is being undertaken at CS1 although we note that sediment is drying out within the cell and dust may be generated. Three rounds of dioxin ambient air monitoring have been completed as per Bay of Plenty Regional Council Resource Consent 67173-AP Condition 39 – Dioxin & Air Quality Monitoring. The dioxin in air results ranged between 5.89 and 12.4 fg/m<sup>3</sup> (corrected to 0 °C, 101.3 kPa) I-TEQ Upperbound. All three samples were below the consented limit of 30 fg/ m<sup>3</sup> (corrected to 0 °C, 101.3 kPa) I-TEQ Upperbound.

Some of the Geobags are having small flaps (approximately 10 cm) cut into them to allow the fungal inoculant to be added by the bioremediation team. Each cut is immediately covered and stitched up. It is not considered that the short term exposure of the material in the bags poses a risk of generating contaminated dust as the sediment is not exposed (it is beneath a 5 to 15 cm thick layer of wood pellet) and the cut is immediately covered and stitched up. Bay of Plenty Regional Council Resource Consent 67173-AP Condition 39.6 allows for ‘small scale puncturing of the geotextile bags’ provided that all openings are sealed as soon as practicable.

#### 4.3.2 CS3

Visual monitoring for nuisance dust is being undertaken at CS3 as vehicular activities associated with moving equipment have the potential to generate dust. Dust suppression will be used if dust is observed at or beyond the site boundary.

## 4.4 Waste Management and Hazardous Material

### 4.4.1 CS1

Rubbish is collected and removed off site.

Oversized bulk bags are awaiting a crane lift into the containment cell. All potentially contaminated equipment is placed within the bunded area awaiting clean up.

### 4.4.2 CS3

Rubbish is collected and removed off site.

## 4.5 Heritage

As no dredging or excavation was undertaken during January 2019, no Koiwi or Taonga was discovered. A Karakia is planned for 8 February 2019, prior to any sediment being pumped to CS3.

The Cultural Monitor has also presented a draft version of a non-urgent discovery protocol designed to deal with small animal bones in the most practical manner. This protocol was prepared in consultation with Te Rūnanga o Ngāti Awa representatives and BOPRC and is intended to assist the Cultural Monitor in dealing with Koiwi or Taonga. This protocol is in addition to the requirements outlined in Bay of Plenty Regional Council Resource Consent 67173-AP Condition 32.1.

## 4.6 Fire Prevention and Response

No issues pertaining to fires were reported during January 2019.

## 4.7 Weed & Dieback Management

Weed removal was not needed during January 2019 as no dredging was occurring.

## 4.8 Articulated Forklift (Merlo) Overturning Incident

An articulated forklift (Merlo) overturned into the Kopeopeo Canal on 22 January 2019. No one was injured and the incident has been reported to WorkSafe New Zealand. Two cranes were used to remove the vehicle. An investigation is ongoing and will be reported on once it is provided to the IM.

## 4.9 Worker Wellbeing

The only worker injury during January 2019 was a hornet sting to a workers leg. This did not require treatment.

A near miss incident was recorded due to the Merlo overturning into the canal; no one was injured.

Fatigue has been a concern raised by the IM and community members over the last eight months, largely due to the strenuous nature of the work and the long hours for the dredging contractors. To mitigate fatigue risks within the team, the rotating week-off roster system continues to be implemented.

Dredging will resume in early February. While an extended 14 hour dredging day has been discussed, the contractor is yet to implement this. This change would need to comply with Bay of Plenty Regional Council Resource Consent 67173-AP Condition 33 – Hours of Work. Worker wellbeing would be managed through shifts and would be closely monitored.

#### 4.10 Noise

Dredging will resume in early February with an extended 14 hour dredging day. This change must comply with Bay of Plenty Regional Council Resource Consent 67173-AP Condition 33 – Hours of Work. As such, any dredging outside 7 am to 6 pm must not occur within 150 metres of a residential dwelling and must comply with NZS 6803:1999 Acoustics – Construction Noise.

The map in Appendix B shows the areas of Section 6 and 7 that are within 150 metres of a residential dwelling.

#### 4.11 Community Interest

The project team will provide a community update with an expected completion date and a summary of what the community may expect in regards to future vehicle access through CS3. This is expected to be completed in late February 2019.

A bunded area was created by WDC adjacent to Kope Canal Road and is being used for dewatering of liquid sludge. This is not associated with the KCRP.

#### 4.12 Complaints Register

One complaint was received on the project complaints register during January 2019. A member of the community was concerned about the lack of Keepa Road stopbank access through CS3 and requested better communication around the closure of the stopbank access road, when it will be reopened, and that other options to deal with fly tipping be considered, rather than restricting access to all.

The project team contacted the community member immediately and informed the person that there would be no access through the site (except by special request for tangi) until at least July/August 2019 due to pumping of contaminated sediment. This would then be followed by bioremediation and closure of the site. No dates have been set for this phase of work and BOPRC may opt to continue to not permit vehicle access as a solution to the former fly tipping problem.

The project team also agreed to provide a community update with expected completion date and a summary of what the community may expect in regards to future vehicle access through the site.

#### 4.13 Compliance Auditing

No Bay of Plenty Regional Council compliance audits were undertaken in January 2019.

## 5. Monitoring and Validation

The validation and sampling strategy is outlined in the Environmental Monitoring and Validation Plan (EMVP) submitted as a requirement under Bay of Plenty Regional Council Resource Consent 67173-AP Condition 4.5.

During January 2019, no monitoring or validation sampling was undertaken as the dredge was not operational and equipment was being moved to CS3 for restart.

## 6. Consent Monitoring Summary

The following consent monitoring summary is intended as a high level summary of consent compliance from the IM as per BOPRC Resource Consent 67173-AP Condition 6.3 (b). This summary is intended to provide the CLG with visibility and assurance that consent compliance is being achieved. The summary only lists conditions that are relevant at the time of writing this report. This summary is not intended to prove compliance with the BOPRC Resource Consent to a consent authority.

Table 2: Consent Monitoring Summary Table

Condition <sup>1</sup>	Description	Compliance	Details
6.1 – 6.3	Independent Monitor	Yes	Continued on site monitoring and reporting.
7.1 – 7.5	Flood Management	Yes	Flood management undertaken in accordance with FMP.
9.1 – 9.5	Erosion and Sediment Controls for Land Outside Canal	Yes	Compliant within KCRP.
10.1 – 10.2	Erosion and Sediment Controls – Canal Works and Discharges to Water	Yes	There does not appear to be any significant erosion of the canal banks occurring.
11.1 – 11.3	Site Access & Traffic Management	Yes	Traffic management associated with equipment moves in January 2019 has finished.
12.2	Discharges from the Containment Sites (Filtrate and Stormwater)	Yes	Stormwater and filtrate are being released back into the Kopeopeo Canal. Live turbidity monitoring is recording that these releases have minimal sediment loads and no discharges are released above 30 NTU. This is not a consent requirement while the FCS are in place.

<sup>1</sup> Bay of Plenty Regional Council Resource Consent 67173-AP (12 May 2017).

Condition <sup>1</sup>	Description	Compliance	Details
13.1 – 13.3	Water Quality Monitoring in the Kopeopeo Canal Outside the Remediation Zone	Yes	As no activities (dredging) were undertaken that could have disturbed the contaminated material during January 2019, water quality monitoring outside of the remediation was not required.
15.1	Kopeopeo Canal Vegetation Disturbance	Yes	Revegetation of the areas around the two boost pumps adjacent to Shaw Road and Paroa Road is complete.
17.1 & 17.5	Kopeopeo Canal Control Structures	Yes	FCS operating appropriately and mobile pumping stations are established in accordance with the FMP. Due to the need to maintain a constant water level to move equipment along the canal, both flood control structures (FCS) were largely left closed in January 2019.
19.1	Excavation of Sediment - Removal Methodology	Yes	The extraction of sediment from the Kopeopeo Canal is being undertaken in general accordance with the methods in the variation application and the Dredging Management Plan. During January 2019, no sediment was removed from the canal.
20.1	Containment Sites - Sediment Disposal	Yes	The sediment extracted from the Kopeopeo Canal is being transported and deposited at the containment sites in general accordance with the variation application and the Dredging Management Plan. During January 2019, no sediment was removed from the canal.
21.1	Containment Sites - Stormwater	Yes	Stormwater has been appropriately managed and discharged from both containment sites.
22.1 – 22.3	Cleaning of Machinery, Structures and Debris	Yes	Equipment currently stored in CS1 requires cleaning within the bunded area. The Merlo that overturned into the canal was placed on plastic and then had the sediment washed back into the canal using low pressure water.
25.1	Validation Sampling – Kopeopeo Canal	Yes	Validation sampling being undertaken as quickly as is practical.

Condition <sup>1</sup>	Description	Compliance	Details
25.2	Validation Sampling – Kopeopeo Canal	Yes	1 in 20 sediment samples are split and analysed at two different laboratories for the purpose of quality assurance.
25.5	Validation Sampling – Kopeopeo Canal	Yes	Control structures in place.
26.1 – 26.4	Communication – Community Liaison Group	Yes	CLG being adequately informed of project activities through email updates. The project team will provide a community update with expected completion date and a summary of what the community may expect in regards to future vehicle access through CS3.
27.1 – 27.2	Complaints Register	Yes	Complaints register reviewed (Section 4.12).
28.1 – 28.5	Spill Prevention & Response	Yes	No spills have occurred outside the containment cell.
29.1	Hazardous Substances	Yes	No spills of hazardous substances.
30.1	Signage	Yes	Appropriate signage is in place along the length of the sediment transfer pipeline. Signs are in place identifying CS3 is closed to public access and directing the public towards alternative walking access along the eastern boundary of CS3. Signage on the walking access also informs the public that the path is not designed to be used by motorcycles.
31.1 – 31.2	Archaeological Sites	Yes	No Koiwi or Taonga have been discovered.
32.1 – 32.2	Cultural Monitor	Yes	As dredging has not occurred during January 2019, the Cultural Monitor has not been required on site.
33.1	Hours of Work	Yes	Consented hours are 7 am to 6 pm. The consent states 7.30 am; however, permission was gained from the consent authority to start at 7 am.  Dredging will resume in early February with an extended 14 hour dredging day. This change must comply with Bay of Plenty Regional Council Resource Consent 67173-AP Condition 33 – Hours of Work. As such, any



Condition <sup>1</sup>	Description	Compliance	Details
			dredging outside 7 am to 6 pm must not occur within 150 m of a residential dwelling and must comply with NZS 6803:1999 Acoustics – Construction Noise.
34.1	Access for Monitoring	Yes	Access has been provided to BOPRC at their request. No BOPRC Compliance Audits were undertaken during January 2018.
35.1 – 35.6	Water Metering & Reporting – Taking Water	NA	The consent authority stated, “this consent condition is void for the current methodology and BOPRC acknowledges that it is not needed to be complied with”.
36.2	Groundwater Monitoring & Responses	Yes	Groundwater monitoring undertaken as described in the GMP.
36.4	Groundwater Monitoring & Responses	Yes	Bi-monthly (every 2 months) groundwater level monitoring is being undertaken at CS1 and will begin at CS3 when the first sediment is deposited into the containment cell.
36.5	Groundwater Monitoring & Responses	Yes	Background groundwater monitoring is complete for both CS1 and CS3.
36.6 – 36.7	Groundwater Monitoring & Responses	Yes	<p>Groundwater quality monitoring is to be undertaken quarterly for the first 12 months of sediment deposition.</p> <p>The latest round of groundwater quality monitoring for CS1 was undertaken in December 2018. As the 12 months of groundwater monitoring undertaken to date at CS1 has not shown any dioxin concentration greater than 30 pg/L (highest result is 9.53 pg/L), groundwater sampling can now continue at annual intervals for the remainder of the consent.</p> <p>Groundwater monitoring at CS3 on a quarterly basis will begin following the first deposition of sediment on the site.</p>

Condition <sup>1</sup>	Description	Compliance	Details
38.1 – 38.2	Air Quality – General	Yes	Air quality undertaken in accordance with the EMVP.
39.1 – 39.6	Dioxin & Air Quality Monitoring	Yes	Ambient air monitoring complete at CS1 with results being below consent limits.
40.1 – 40.7	Dust Management	No	The containment cell at CS1 is currently dry and contains sediment that has been spilt over the last 12 months. While there is a hard crust to the sediment that makes dust generation unlikely, it is not being kept wet and as such, it may breach Consent Condition 40.1.
42.1 – 42.3	Remedial Action for Dust Emissions at the Containment Sites	Yes	No dust emissions have been identified.
43.1 – 43.4	Odour Management & Monitoring	Yes	No odour identified within either of the containment cells.
44.1 – 44.3	Soil Quality & Monitoring	Yes	Baseline soil sampling undertaken at CS3.
45.1 – 45.3	Aquatic Species	Yes	Suitable fish removal undertaken within the KCRP area.
46.1	Saltmarsh	Yes	Water levels within the canal are not being artificially held above 0.2 m RL (Moturiki Datum).

## 7. Conclusion

Dredging was on hold during January 2019 while the water treatment plant was moved from CS1 to CS3 in preparation for dredging recommencement in early February. There was no monitoring or validation undertaken during this period as no sediment was being dredged and focus was on setting up equipment for dredging Section 6 of the canal.

The majority of equipment was removed from CS1 and the site is in need of further tidying and cleaning. The cell at CS1 is dry and the sediment spilled in the cell needs to be contained within the Geobags ahead of the cell closure. The bioremediation team has been inoculating some of the Geobags in CS1 with fungus to start the bioremediation process.

The water treatment plant and office space was moved to CS3 and the pipeline has been laid out to the containment cell.

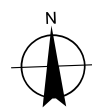
February 2019 will see dredging begin in Section 6.

# Appendices

# Appendix A – Site Plan



Paper Size A4  
 0 25 50 100  
 Metres  
 Map Projection: Transverse Mercator  
 Horizontal Datum: NZGD 2000  
 Grid: NZGD 2000 New Zealand Transverse Mercator



**LEGEND**

- Perimeter drain sample location
- Monitoring well location
- Turbidity monitoring point
- CS1
- FCS West
- Water treatment plant
- Topsoil stockpile
- Property boundary



Bay of Plenty Regional Council  
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Site Plan

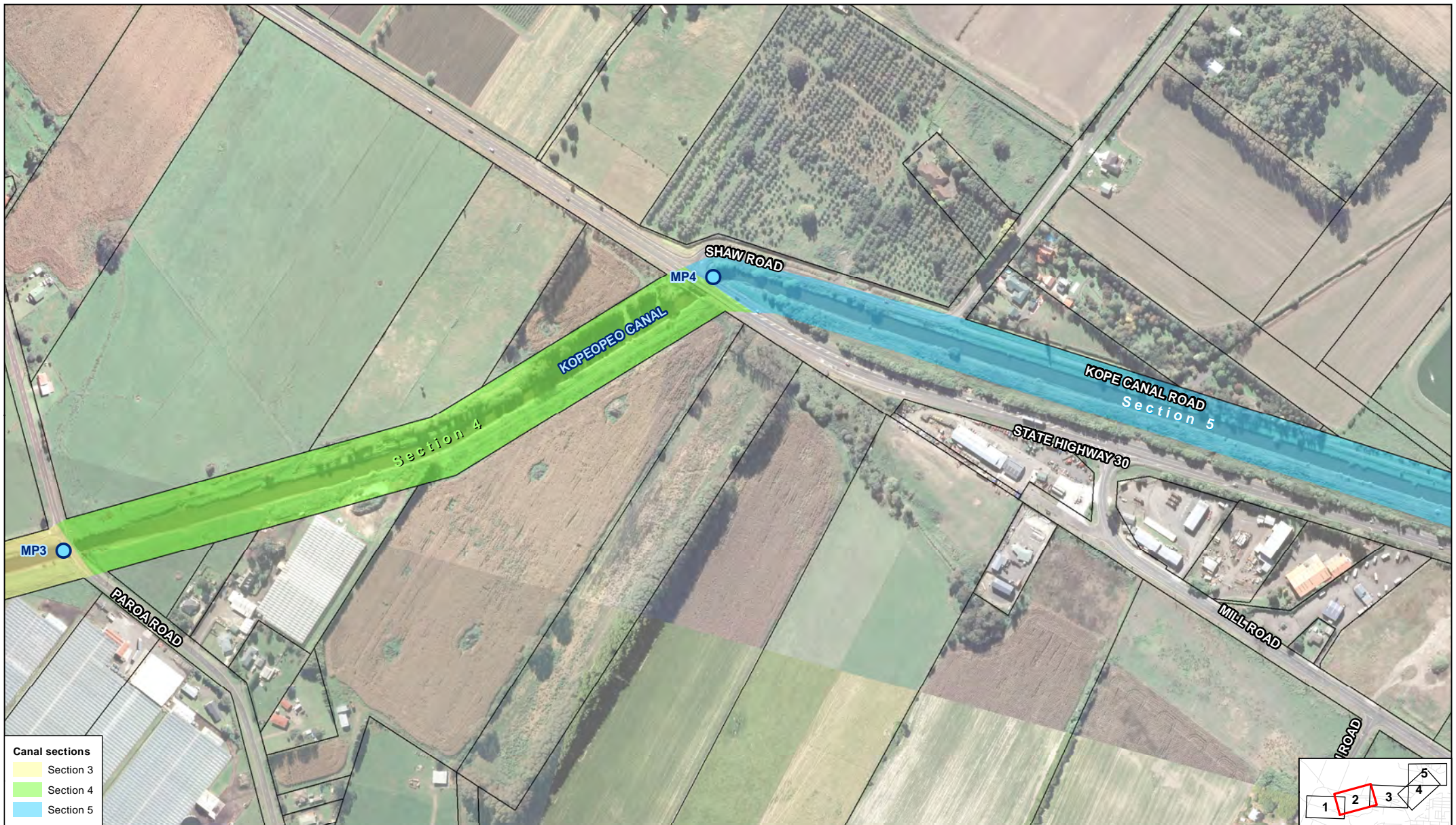
Figure 1

N:\NZ\Auckland\Projects\51\33279\GIS\Maps\Deliverables\51\_33279\_Z001\_SitePlan.mxd

Level 1, 104 Spring Street, Tauranga 3110, New Zealand T 64 7 557 0110 E akimail@ghd.com W www.ghd.com

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Data source: Aerial imager - LINZ 2018 & ESRI 2018; General topo - LINZ 2018. Created by:jrprice



Paper Size A4  
 0 25 50 100  
 Metres

Map Projection: Transverse Mercator  
 Horizontal Datum: NZGD 2000  
 Grid: NZGD 2000 New Zealand Transverse Mercator

**LEGEND**

- Turbidity monitoring point
- Property boundary



Bay of Plenty Regional Council  
 Kopeo Canal Remediation Project

Job Number 51-33279  
 Revision A  
 Date 22 Jan 2019

Site Plan

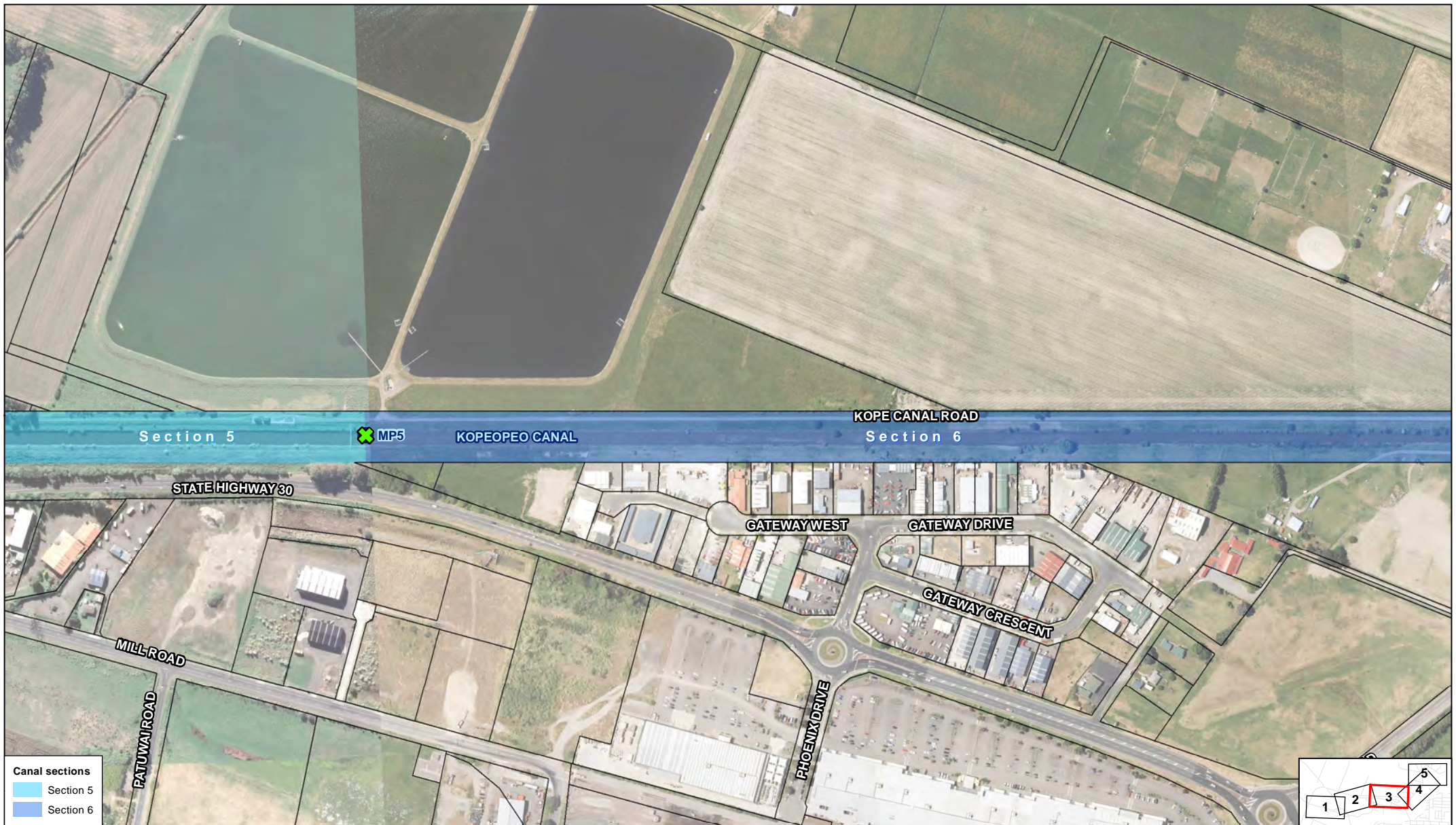
Figure 2

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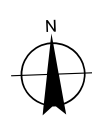
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Data source: Aerial imager - LINZ 2018 & ESRI 2018; General topo - LINZ 2018. Created by:jprice



Paper Size A4  
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 Metres  
 Map Projection: Transverse Mercator  
 Horizontal Datum: NZGD 2000  
 Grid: NZGD 2000 New Zealand Transverse Mercator



LEGEND  
 Turbidity monitoring point  
 Current dredge location  
 Property boundary



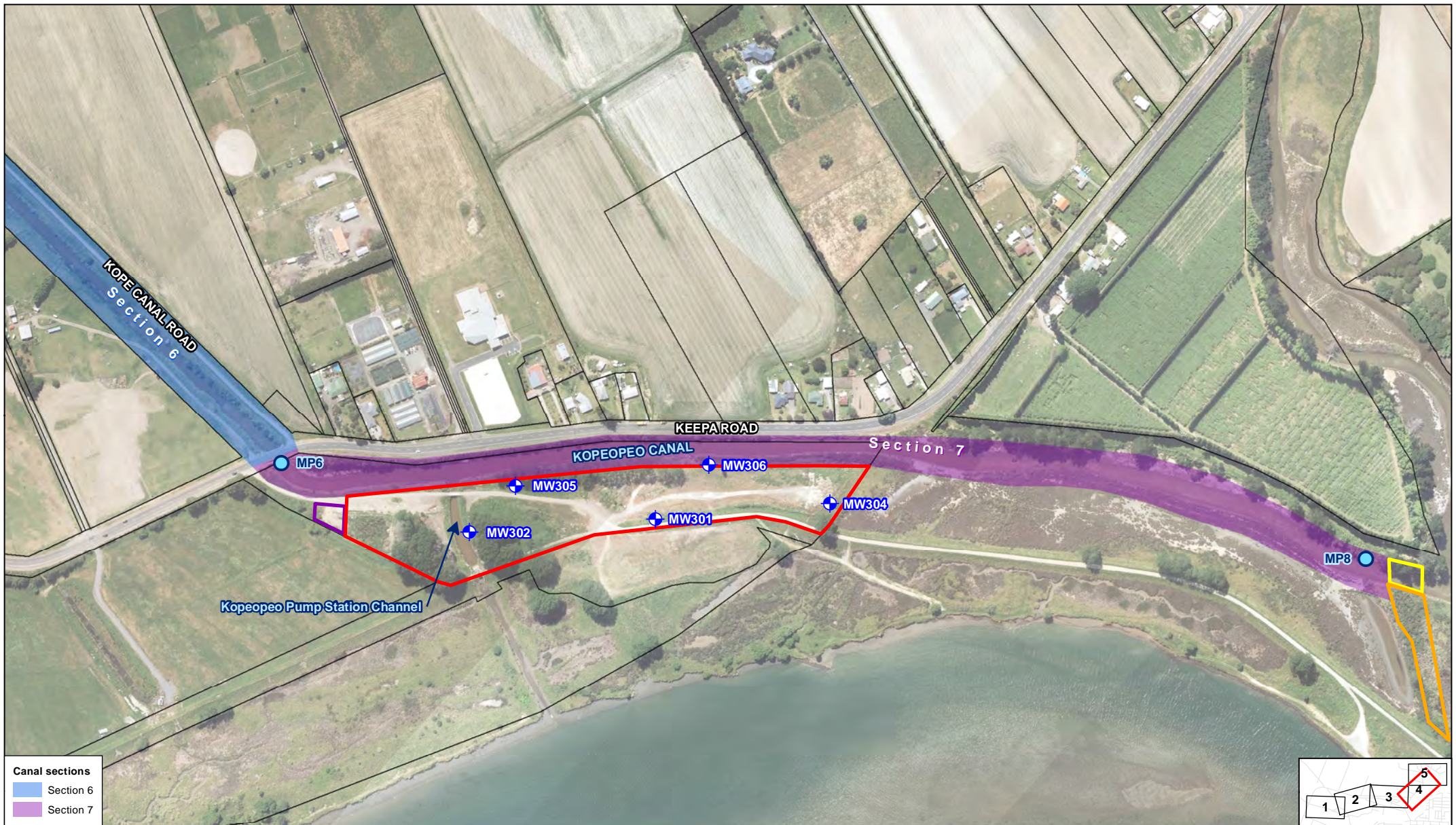
Bay of Plenty Regional Council  
 Kopeopeo Canal Remediation Project

Job Number 51-33279  
 Revision A  
 Date 22 Jan 2019

Site Plan

Figure 3





**Canal sections**  
 Section 6  
 Section 7

Paper Size A4  
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 Map Projection: Transverse Mercator  
 Horizontal Datum: NZGD 2000  
 Grid: NZGD 2000 New Zealand Transverse Mercator



**LEGEND**

- Monitoring well location
- Turbidity monitoring point
- CS3
- FCS East
- Access road built to enable control structure construction
- Property boundary
- Public car park



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Site Plan

Figure 4



Paper Size A4  
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 Metres  
 Map Projection: Transverse Mercator  
 Horizontal Datum: NZGD 2000  
 Grid: NZGD 2000 New Zealand Transverse Mercator



**LEGEND**  
 ● Compliance Turbidity monitoring point  
 ● Turbidity monitoring point  
 □ FCS East  
 □ Property boundary  
 □ Access road built to enable control structure construction



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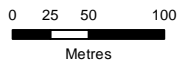
Site Plan

Figure 5

## Appendix B – Residential dwelling noise map



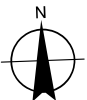
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Metres

Map Projection: Transverse Mercator  
Horizontal Datum: NZGD 2000

Grid: NZGD 2000 New Zealand Transverse Mercator



LEGEND

- Residential dwelling
- Dredging restriction zone
- Property boundary

Canal sections

- Section 5
- Section 6



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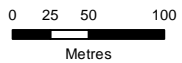
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Dredging Restrictions

Figure 1



Paper Size A4



Map Projection: Transverse Mercator  
Horizontal Datum: NZGD 2000  
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LEGEND

- Residential dwelling
- Dredging restriction zone
- Property boundary

Canal sections

- Section 6
- Section 7



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Dredging Restrictions

Figure 2

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Level 3, GHD Centre  
27 Napier Street

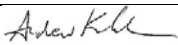
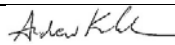
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Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1.0	M. James	A. Kohlrusch		A. Kohlrusch		06/03/19

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