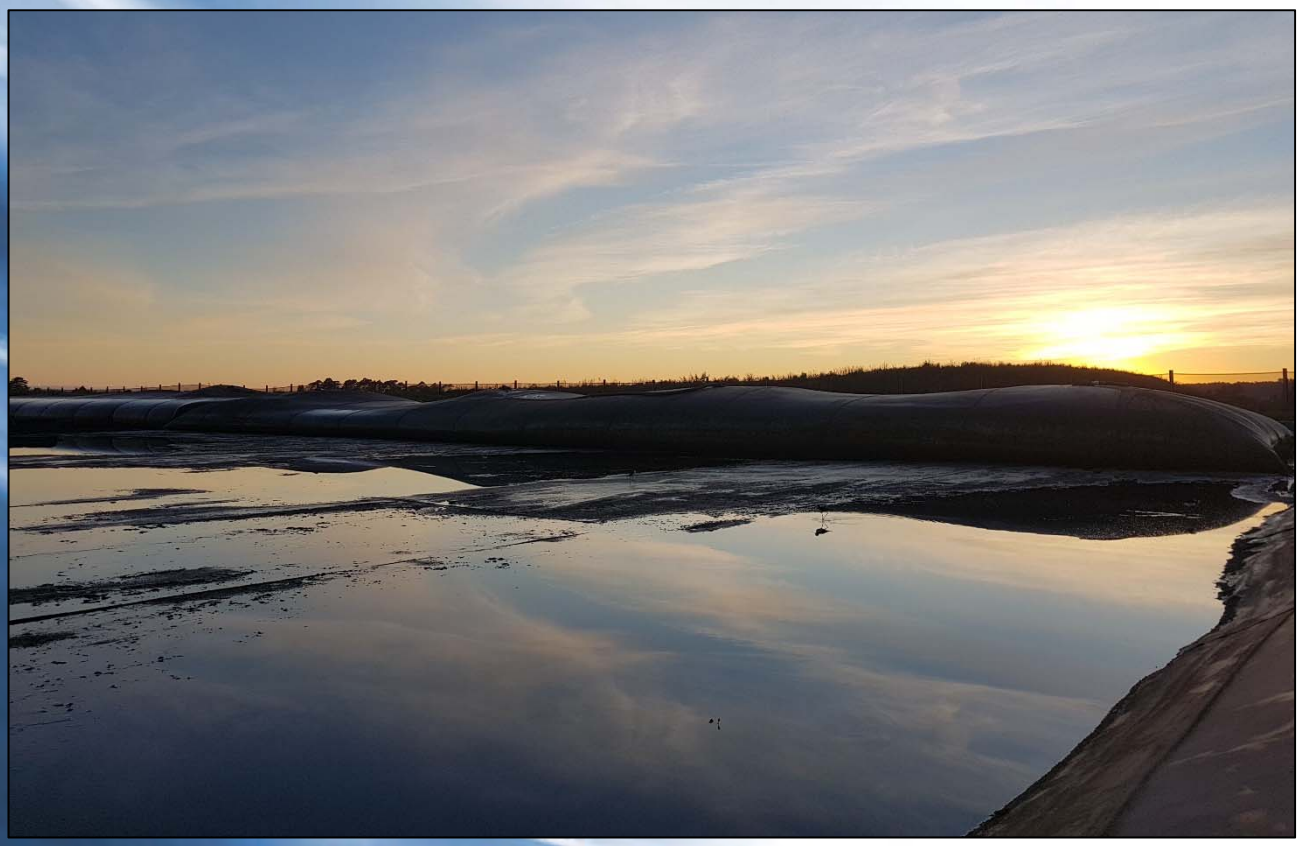

Bay of Plenty Regional Council

Kopeopeo Canal Remediation

CLG Monthly Update Report

February 2019

Executive summary

Dredging of Section 6 of the Kopeopeo Canal began in February 2019 with the sediment being pumped to CS3. This was then followed by the first round of sediment validation in Section 6.

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.

Two spills of contaminated sediment occurred adjacent to the water treatment plant at CS3 and were contained and cleaned appropriately.

Flood management in the canal continued throughout February with no significant rainfall events.

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. The investigation is complete and the corrective actions outlined in the report have been implemented.

March will see continued dredging through Section 6 along with work to tidy and clean CS1, continued bioremediation preparation at CS1 and commencement of CS1 for closure.

During February 2019, the following analytical sampling was undertaken and reported:

Canal Sediment Validation

In February 2019, dredging of Section 6 of the Kopeopeo Canal began, with subsequent sediment validation sampling. Four validation samples (KC085 – KC088) were taken from behind the dredge within Section 6 (See Validation Plan in Appendix B). The Total PCDD/F (dioxin) I-TEQ Upperbound results were between 27 and 380 pg/g. Of the four samples analysed, only one dioxin result (KC088) of 380 pg/g, triggered the need for redredging in accordance with the EMVP. The remaining three samples had dioxin results of 27, 46, and 48 pg/g, which is below the remedial target of 60pg/g. The 95% UCL was calculated as being 37 pg/g for the length of the canal chemically validated as at 28 February 2019.

Groundwater and Perimeter Drain Sampling

Groundwater sampling was undertaken at CS3 and perimeter drain soil samples were taken at CS1. These results are pending and will be documented in the March 2019 CLG Report.

The following report is based upon the observations and commentary by the Independent Monitor Field Observer (Matt James) with support from the Independent Monitor (Andrew Kohlrusch). This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.3 and the assumptions and qualifications contained throughout the Report.

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Appendices

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 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 canal's 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 (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 this Community Liaison Group (CLG) Monthly Update Report (February 2019) is to provide an independent summary of the progress of the Kopeopeo Canal Remediation Project. The CLG Monthly Update Report (February 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 February 2019 (Refer to photographs in Table 1: Photograph Progress Log):

- Bioremediation is underway at CS1 with the bioremediation team continuing to add fungal inoculant to the Geobags.
- CS1 is in an untidy state as it awaits clean up following the transfer of equipment to CS3 (Photograph 10).
- Sediment has been spilled within the containment cell at CS1 and is yet to be contained within the Geobags (Photograph 11).
- Soil that was removed from a drain adjacent to the Kopeopeo Canal is being stored within the bunded area and will be added into the containment cell (Photograph 7). This material is not from the Kopeopeo Canal.

2.2 CS3

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

- Dredging and pumping of contaminated sediment to Geobags began (Photographs 1 and 3). What appears to be iron precipitate is forming on the surfaces of the containment cell and on the Geobags (Photograph 12). This is likely due to temperature, pH, or salinity changes during warm weather that was also experienced at CS1 in 2018.
- Bird bones were found and the discovery protocol was enacted by the Cultural Monitor (Photograph 6).
- Oversized material being separated during the dredging process has consisted of predominantly bark and saw dust in the early part of Section 6 (Photograph 15). This material is likely to have entered the canal through the stormwater network from the Whakatane mill.
- Two releases of canal water containing sediment occurred outside of the water treatment area bund (Photograph 9). One was caused by one of the shakers turning off and the other was caused by a valve vibrating closed during pumping. All of the areas where water and sediment spilt were scraped using an excavator and placed into oversized bulk bags for placement into a containment cell (Photograph 13).
- Two boost pumps are operating along Kope Canal Road to move sediment to CS3 (Photographs 2, 4 and 5).

2.3 Project Area

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

- Noise monitoring is being undertaken around the project area (Photograph 4).
- The first round of canal sediment validation was undertaken by Golder Associates Limited (GAL) in Section 6 (Photograph 14).
- The Paroa Road boost pump is not operating and is awaiting removal (Photograph 8).

- Both flood control structures (FCS) were used to manage optimal canal water levels for dredging and consent requirements.
- 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
	Photograph 1: Dredge operating in Section 6. The dredge head is being checked for blockages in this photo.
	Photograph 2: One of the boost pumps in the foreground with the dredge working along Section 6 in the background.
	Photograph 3: Sediment being pumped to the first Geobag in CS3. The water treatment plant is visible in the background.

Photograph	Event
	Photograph 4: Noise monitoring being undertaken at one of the boost pumps adjacent to Kope Canal Road.
	Photograph 5: Boost pump situated behind the industrial properties off Gateway Drive.
	Photograph 6: Bird bones discovered in the water treatment plant.

Photograph	Event
	Photograph 7: Material removed from drains adjacent to Kopeopeo Canal is stockpiled within the bund at CS1. This material is not from the Kopeopeo Canal.
	Photograph 8: Inspecting the inactive boost pump at Paroa Road.
	Photograph 9: Area where contaminated water spilled outside the bunded water treatment area.

Photograph	Event
	Photograph 10: Used oil containers at CS1 awaiting disposal.
	Photograph 11: Sediment dried hard within CS1 awaiting clean up.
	Photograph 12: Iron precipitate forming on the Geobags and CS3 liner. The water flowing into the sump is clear.

Photograph	Event
	Photograph 13: Material stockpiled after a spill of sediment from the water treatment plant. This material is to be placed into bulk bags, which will then be transferred to the containment cell.
	Photograph 14: Golder Associates Limited (GAL) undertaking the first round of validation in Section 6.
	Photograph 15: Bark and saw dust coming out of the water treatment plant as oversized material. This is likely to have come from the Whakatane mill through the stormwater system.

3. Community Liaison Group Update

3.1 Community Concerns

A CLG meeting was held on 26 February 2019 and the following points were discussed:

- KCRP website interaction, with approximately 2600 unique page visits in the last 12 months.
- Project turn around and set up at CS3 update.
- A member of the community made a submission to the CLG, including the request that the submission was also presented to the Project Steering Group (PSG). This submission included research papers. The chair of the CLG and the IM noted that a response to the submission will be provided.
- The IM provided an update on validation in Section 5.
- The project team provided an update on intended progress for the next period.
- The contractor provided information on the Merlo overturning incident and the various environmental and dust challenges being managed.
- Members of the community raised concerns around project timelines, specifically around the removal of the control structures within the canal.

The project complaints register for February 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 February 2019.

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

4.1.1 Project Area

Virgin quarry rock has been placed on the Kopeopeo Canal stopbank opposite Kope Canal Road. This material is forming a stable working platform for one of the boost pumps and will be shaped and compacted once the pump is no longer required.

Tree and shrub removal is planned for the stopbanks along Section 6. This is to allow the barge more room to safely work and remove the weight of vegetation from the stopbank to increase stability.

4.1.2 CS1

CS1 is currently undergoing the final stages of the set up for bioremediation including the loading of wood pellet into the Geobags, and the addition of fungal and bacteria inoculant. Topsoil capping will then be placed over the Geobags and trees will be planted on it.

4.1.3 CS3

Odour from the sediments at the CS3 treatment plant has been noted in close proximity to the equipment, but not beyond the site boundary. Odour neutralisers are available if required and will be placed around the water treatment plant should odours be detected outside the CS3 boundary.

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 dredge effectively, both flood control structures (FCS) were largely left closed.

The flood control structures are checked daily and the side culverts of the canal are checked weekly. These checks are reported as part of the Flood Management Situation Report prepared by the deputy project manager on a daily basis as part of the requirements outlined in the Bay of Plenty Regional Council Resource Consent 67173-AP Condition 7 – Flood Management. 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

Real time turbidity monitoring equipment is operational within the Kopeopeo and Orini canals and within the sumps at CS1 & CS3.

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; both the IM and project team have 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 and February 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 consent Condition 40.1 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 is 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 that 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 clean up has begun and the methodology involves using water and brooms to recirculate the material into the Geobags where it is securely contained.

4.2.3 CS3

Rainfall collected in CS3 is discharged as part of the Geobag dewatering process into the Kopeopeo Canal.

On two occasions during February 2019, water containing contaminated sediment spilled outside the water treatment plant bunded area. These spills were caused by one of the oversized material shaker screens turning off, and by a valve vibrating closed. The areas of the spills were marked immediately using paint and then an excavator was used to scrape down the contaminated areas and place the material into bulk bags. These bags are then stored within the containment cell.

4.3 Dust Management

4.3.1 CS1

No nuisance-dust monitoring is being undertaken at CS1 although it is noted that sediment is drying out within the cell and dust may be generated.

4.3.2 CS3

No nuisance-dust monitoring is being undertaken at CS3 as no dust generating activities are taking place.

4.3.3 Project Area

Nuisance dust monitoring is being undertaken adjacent to Kope Canal Road following multiple dust complaints from members of the community. The complaints are associated with nuisance dust from vehicles travelling along Kope Canal Road and not related to Project activities. A temporary speed limit is also being enforced by the project team in this area and contractors have been asked to keep vehicle movements to a minimum. This road is also used by vehicles that are not associated with the KCRP, and as such, enforcing these measures will be a challenge.

4.4 Waste Management and Hazardous Material

4.4.1 CS1

Rubbish is collected and removed off site.

Oversized material bulk bags are currently sitting outside the bunded area at CS1 awaiting a crane lift into the containment cell. The area beneath these bulk bags will also require validation to confirm that contaminated material does not leak from the bags during this process.

4.4.2 CS3

Rubbish is collected and removed off site.

Oversized material coming off the water treatment plant as part of the sediment dredging process is being stored on site in one-tonne bulk bags. These bags are then lifted into the containment cell. Approximately 1200 bulk bags have been filled with oversized material from along the entire canal length dredged to 28 February 2019. Approximately 1000 of these bulk bags are stored at CS1.

4.5 Heritage

During February there were no artefacts identified by the Cultural Monitor or archaeologist as Koiwi or Taonga. Small bones are being bagged and reported as they come across the screens on the water treatment plant or are found on the barge. The Cultural Monitor or her representative is notified of all dredging activity to allow monitoring of the oversized material.

The Cultural Monitor 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 February 2019.

4.7 Weed & Dieback Management

Weed removal was not needed during February 2019, as the area being dredged did not have a significant build-up of weed.

4.8 Articulated forklift (Merlo) overturning incident

On 22 January 2019 at 11.34 am, an articulated forklift (Merlo) slipped into the Kopeopeo canal while pulling pipework on the canal stopbank. No workers were injured during the incident as

the driver managed to jump out of the vehicle before it entered the canal. Emergency services, environmental authorities, and WorkSafe New Zealand were notified of the incident. Worksafe New Zealand did not attend the site and the case is now closed.

An EnviroNZ Serious Incident Investigation Report (Incident Form No. 03799) was provided to BOPRC and the IM. The immediate cause of the incident, outlined in the investigation, was the right-hand front wheel of the Merlo travelling over the edge of the canal stopbank causing the vehicle to fall uncontrollably into the stream. The Merlo was being operated too close to the edge of the canal stopbank even after identifying stopbank edge stability as a hazard in toolbox meetings and preparing a JSA.

The following corrective actions were outlined in the investigation report:

- Ensure stability is recognised as a hazard in all appropriate JSA's and suitable controls (including a three metre safe work zone) are implemented.
- Regularly supervise and or audit that the three metre working zone is being adhered to.
- Complete daily stopbank integrity checks before commencing any work on or near the stopbank.
- Review suitability of the Merlo for pipe pulling activities.
- Ensure all operators are competency trained and tested for all vehicles they will operate on site.

4.9 Worker Wellbeing

A worker cut his hand on 24 February 2019 and first aid was administered on site. The injury was minor.

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.

An extended 14 hour dredging day has been considered, but has not yet commenced. This change must comply with Bay of Plenty Regional Council Resource Consent 67173-AP Condition 33 – Hours of Work. Worker wellbeing is being managed through shifts and will be closely monitored.

4.10 Community Interest

The pedestrian track around the outside of CS3 has undergone maintenance including rolling to level the track. The project team asks that community members please do not ride motorbikes along the track or up the stairs as it is a health and safety risk.

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.

4.11 Noise

The water treatment plant at CS3 is operating using mains power opposed to the diesel generator that was used at CS1. The operation at CS3 is now significantly quieter.

A variation to Bay of Plenty Regional Council Resource Consent 67173-AP Condition 33.1 was received by BOPRC on 12 February 2019. This variation removed the following wording from the consent:

- "where the dredging operation is located no closer than 150 m from the nearest residential dwelling'

This variation allows the dredge to operate within 150 m of a residential dwelling as long as the dredging operation complies with NZS 6803:1999 Acoustics – Construction Noise.

4.12 Complaints Register

The project complaints register for February 2019 was reviewed by the IM and the following complaints and actions were recorded:

Date	Complaint	Action
08/02/19	A member of the public complained that there were dead fish in the Kopeopeo Canal near FCS West.	Project team opened the FCS gates to allow water to flow through the project area, increasing the dissolved oxygen and lowering the water temperatures, creating a better habitat for the fish.
12/02/19	Nuisance dust complaint from vehicles travelling along Kope Canal Road.	Project team has installed a temporary dust monitor adjacent to the complainants' property to provide live dust monitoring. The addition of dust suppressant to Kope Canal Road is being investigated. A speed restriction is being put upon the road and all project and Whakatane District Council (WDC) staff working in the area have been told to go as slowly as possible. Monitoring to date has shown dust levels well below consented targets.
13/02/19	Nuisance dust complaint from vehicles travelling along Kope Canal Road.	
18/02/19	Nuisance dust complaint from vehicles travelling along Kope Canal Road.	

4.13 Compliance Auditing

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

5.1 Canal Sediment

The Bay of Plenty Regional Council Resource Consent 67173-AP Condition 25.4 states that "The remediation zone within the Kopeopeo Canal shall be deemed as being remediated when the 95% Upper Confidence Limit ('UCL') for dioxin concentration is determined to be at or below 60 pg I-TEQ-g using the validation methodology set out in the Environmental Monitoring and Validation Plan required by condition 4.5". The technical definition of a 95% UCL is "a number that one can be 95% confident that the true mean (average) concentration of the population is below that value".

During February 2019, four validation samples (KC085 – KC088) were collected from behind the dredge within Section 6 (See Validation Plan in Appendix B). The Total PCDD/F (dioxin) I-TEQ Upperbound results were between 27 and 380 pg/g. Of the four samples analysed, only one dioxin result (KC088) of 380 pg/g, triggered the need for redredging in accordance with the EMVP. The remaining three samples had dioxin results of 27, 46, and 48 pg/g, which is below the remedial target.

The 95% UCL was calculated as being 37 pg/g for the length of the canal chemically validated as at 28 February 2019.

5.2 CS3 Groundwater

Groundwater sampling was undertaken by GAL at CS3 on 27 February 2018. The results are pending and will be presented in the March 2019 CLG Report.

5.3 CS1 Perimeter Drain

Soil sampling was undertaken by GAL at CS1 on 27 February 2018. The results are pending and will be presented in the March 2019 CLG Report.

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[1]	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	Signage has been placed at the exit of CS3 to remind project traffic of the pedestrian and cycle traffic risk. The project team has also asked all project traffic using Kope Canal Road to travel slowly enough as to not generate any dust.
12.2	Discharges from the Containment Sites (Filtrate and Stormwater)	Yes	Stormwater and filtrate are being released back into the Kopeopeo Canal from CS3. Live turbidity monitoring is underway from both of the sumps at CS3 in an effort to keep turbidity in discharge water as low as possible. This is not a consent requirement while the FCS are in place.

[1] Bay of Plenty Regional Council Resource Consent 67173-AP (12 May 2017).

Condition[1]	Description	Compliance	Details
13.1 – 13.3	Water Quality Monitoring in the Kopeopeo Canal Outside the Remediation Zone	Yes	Real time turbidity monitoring shows that turbidity in the water released from the KCRP area into the Orini/Kopeopeo confluence was no greater than 20% above background.
15.1	Kopeopeo Canal Vegetation Disturbance	Yes	Tree and shrub removal is planned for the stopbanks along Section 6.
17.1 & 17.5	Kopeopeo Canal Control Structures	Yes	FCS operating appropriately and mobile pumping stations are established in accordance with the FMP.
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.
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.
21.1	Containment Sites - Stormwater	Yes	Stormwater is being stored in CS1 to assist with dust suppression and stormwater is being released from CS3 as part of the dredging filtrate discharges.
22.1 – 22.3	Cleaning of Machinery, Structures and Debris	Yes	Equipment is being appropriately cleaned.
25.1	Validation Sampling – Kopeopeo Canal	Yes	Validation sampling is undertaken as quickly as is practical.
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 are in place.

Condition[1]	Description	Compliance	Details
26.1 – 26.4	Communication – Community Liaison Group	Yes	CLG being adequately informed of project activities.
27.1 – 27.2	Complaints Register	Yes	Complaints register reviewed (Section 4.12).
28.1 – 28.5	Spill Prevention & Response	Yes	Water containing contaminated sediment was spilled outside the water treatment cell bund on two occasions during February 2019. Both spills were contained and remediated adequately.
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. Signage has also been installed at the exit of CS3 to warn project traffic of the risk of pedestrian and cycle traffic.
31.1 – 31.2	Archaeological Sites	Yes	No Koiwi or Taonga have been discovered.
32.1 – 32.2	Cultural Monitor	Yes	The Cultural Monitor or an appropriately trained representative is on site to provide oversight during the dredging.
33.1	Hours of Work	Yes	Working 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. A consent variation received in February 2019 allows the dredge to operate within 150 m of a residential dwelling as long as the dredging operation complies 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 February 2019.

Condition[1]	Description	Compliance	Details
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.
36.5	Groundwater Monitoring & Responses	Yes	Background groundwater monitoring is complete for both CS1 and CS3.
36.6 – 36.7	Groundwater Monitoring & Responses	Yes	Groundwater quality monitoring is to be undertaken quarterly for the first 12 months of sediment deposition. 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. Groundwater monitoring at CS3 on a quarterly basis began in February due to the deposition of the first sediment into the containment cell.
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

Condition[1]	Description	Compliance	Details
			sediment that makes dust generation unlikely, it is not being kept wet and as such, it may breach Consent Condition 40.1.
41.1	Dust Monitoring	Yes	Dust is being appropriately monitored using visual means.
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	Slight odour identified within CS1, but no odour identified outside the site boundary.
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

In February 2019, dredging of Section 6 of the Kopeopeo Canal commenced, along with subsequent sediment validation sampling following dredging of 100 metres of Section 6. Four validation samples (KC085 – KC088) were taken from behind the dredge within Section 6 (See Validation Plan in Appendix B). The Total PCDD/F (dioxin) I-TEQ Upperbound results were between 27 and 380 pg/g. Of the four samples analysed, only one dioxin result (KC088) of 380 pg/g, triggered the need for redredging in accordance with the EMVP. The remaining three samples had dioxin results of 27, 46, and 48 pg/g, which is below the remedial target. The 95% UCL was calculated as being 37 pg/g for the length of the canal chemically validated as at 28 February 2019.

Groundwater sampling was undertaken at CS3 and perimeter drain soil samples were collected around CS1. These results are pending and will be reported in the March 2019 CLG Report.

Cleaning and tidying of CS1 is still ongoing and there remains dry sediment in the base of the containment cell. This material is being cleaned up by Waiotahi Contractors and is expected to have been fully contained by the end of March 2019.

The IM identified a potential breach of Consent Condition 40.1 in relation to sediment being left within CS1 in a dry state. All remaining consent conditions checked by the IM appeared to be compliant.

Two spills of contaminated sediment occurred adjacent to the water treatment plant and were contained and cleaned appropriately.

Flood management continued throughout February with no significant rainfall events.

March will see continued progress dredging through Section 6 along with continued work to tidy and clean CS1, continue bioremediation, and start preparing the cell for closure.

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

N

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
Kopeopeo Canal Remediation Project

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Date	19 Mar 2019

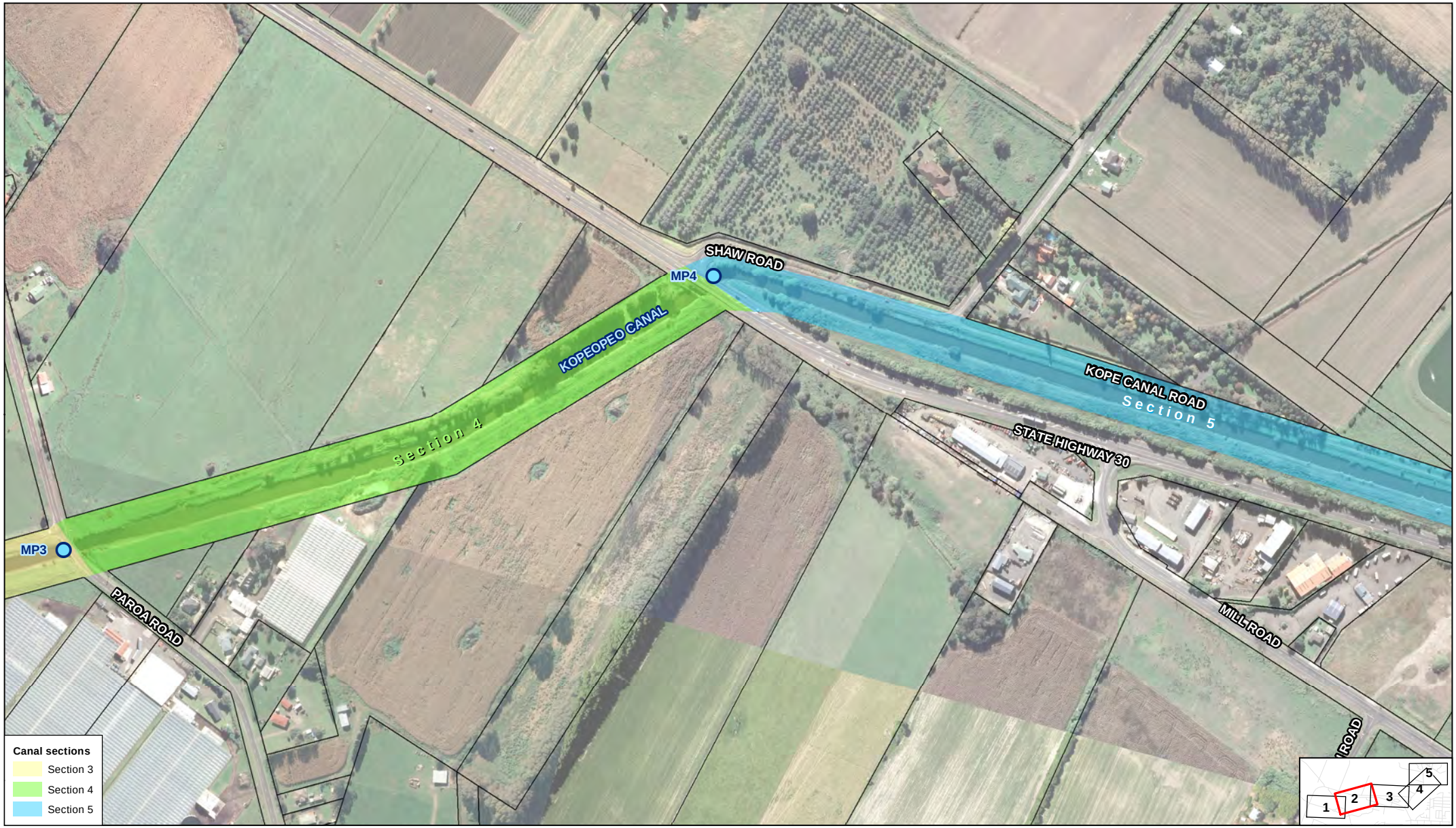
Site Plan

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 aklmail@ghd.com W www.ghd.com

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

N

LEGEND

Turbidity monitoring point

Property boundary

Bay of Plenty Regional Council
Kopeopeo Canal Remediation Project

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Date	19 Mar 2019

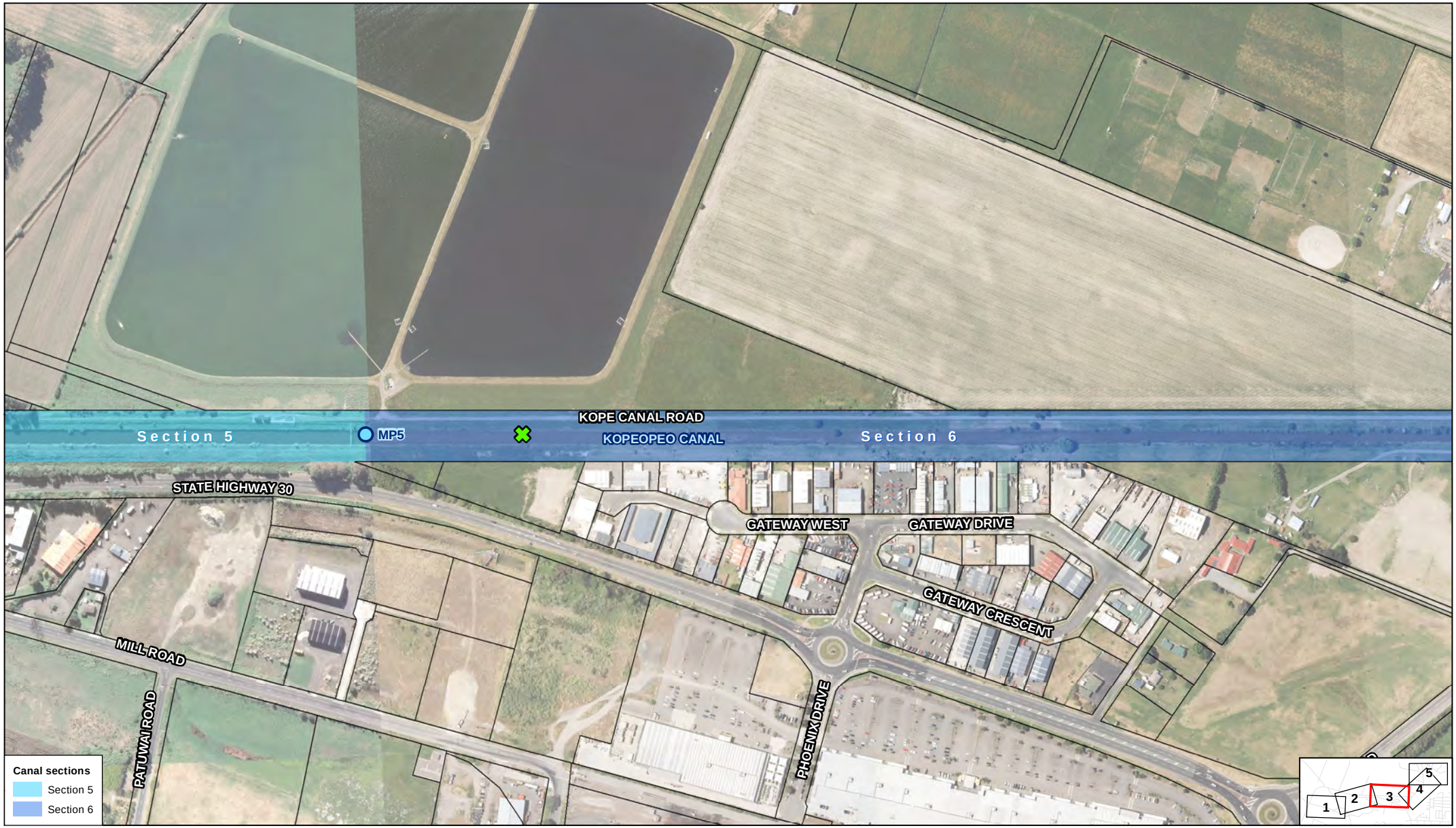
Site Plan

Figure 2

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** aklmail@ghd.com **W** www.ghd.com

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



Paper Size A4

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Metres

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

N

LEGEND

- Turbidity monitoring point
- Current dredge location
- Property boundary

Bay of Plenty Regional Council
Kopeopeo Canal Remediation Project

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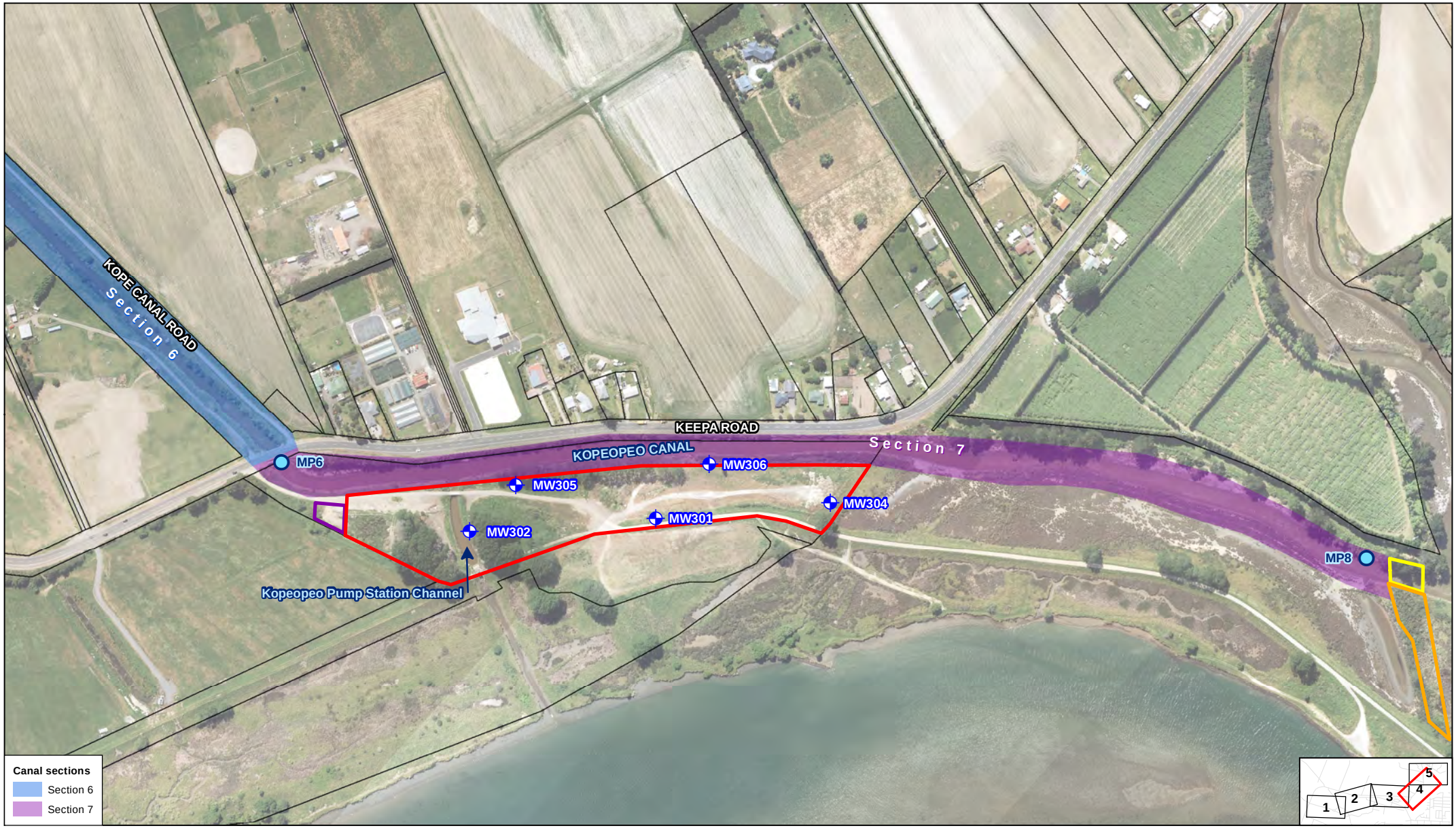
Site Plan

Figure 3

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** aklmail@ghd.com **W** www.ghd.com

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



Paper Size A4

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Metres

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

LEGEND

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

Bay of Plenty Regional Council
Kopeopeo Canal Remediation Project

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Site Plan

Figure 4

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 aklmail@ghd.com W www.ghd.com

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

Paper Size A4

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Metres

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

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LEGEND

- Compliance Turbidity monitoring point
- Turbidity monitoring point
- Access road built to enable control structure construction
- FCS East
- Property boundary

Bay of Plenty Regional Council
Kopeopeo Canal Remediation Project

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Revision A
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Site Plan

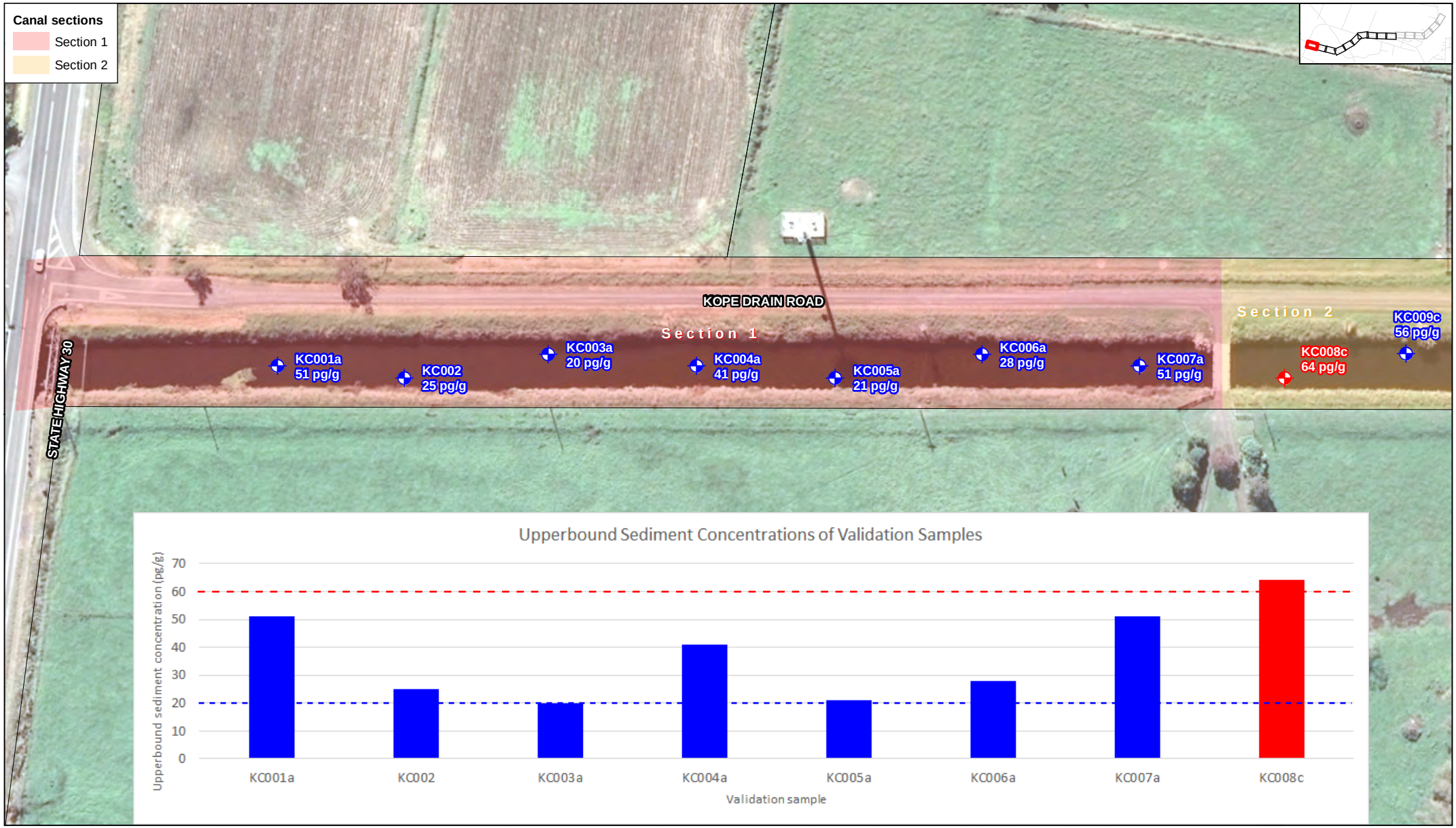
Figure 5

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 aklmail@ghd.com W www.ghd.com

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

Appendix B – Canal Sediment Validation Locations



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Metres

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

LEGEND

- Validation samples (upperbound sediment concentration < 60 pg/g)
- Validation samples (upperbound sediment concentration > 60 pg/g)
- Property boundary

Canal Sediment Validation 95% UCL of 36.52 pg/g
Remedial target = 60 pg/g

Bay of Plenty Regional Council
Kopeopeo Canal Remediation Project

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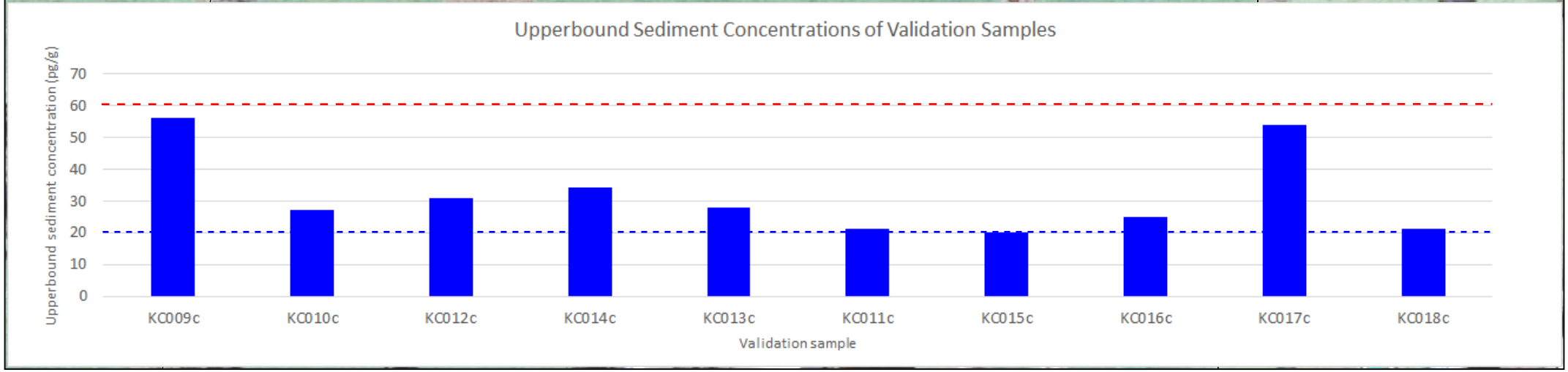
Validation Samples

Figure 1

N:\NZ\Auckland\Projects\51\33279\GIS\Maps\Deliverables\51_33279_Z002_ValidationSamples.mxd

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

Data source: Aerial imagery - LINZ 2017 & ESRI 2019; General topo - LINZ 2018; Validation samples - Golder. Created by:jrprice



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Metres

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

N

LEGEND

Validation samples (upperbound sediment concentration < 60 pg/g)

Property boundary

Canal Sediment Validation 95% UCL of 36.52 pg/g
Remedial target = 60 pg/g

Bay of Plenty Regional Council
Kopeopeo Canal Remediation Project

Job Number	51-33279
Revision	A
Date	14 Mar 2019

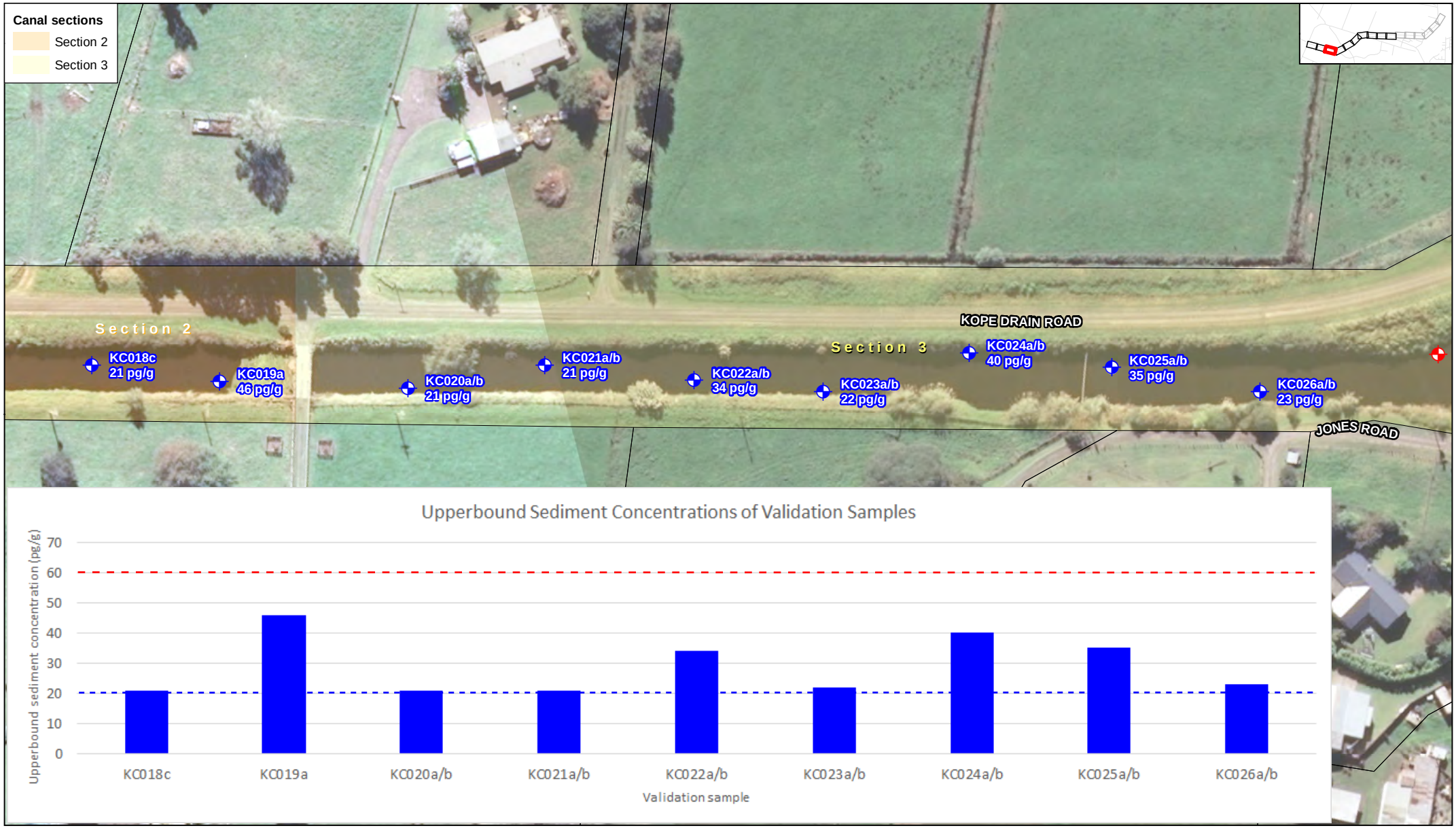
Validation Samples

Figure 2

N:\NZ\Auckland\Projects\51\33279\GIS\Maps\Deliverables\51_33279_Z002_ValidationSamples.mxd

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

Data source: Aerial imagery - LINZ 2017 & ESRI 2019; General topo - LINZ 2018; Validation samples - Golder. Created by:jrprice



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Metres

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

N

LEGEND

- Validation samples (upperbound sediment concentration < 60 pg/g)
- Validation samples (upperbound sediment concentration > 60 pg/g)
- Property boundary

Canal Sediment Validation 95% UCL of 36.52 pg/g
Remedial target = 60 pg/g

Bay of Plenty Regional Council
Kopeopeo Canal Remediation Project

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Validation Samples

Figure 3

N:\NZ\Auckland\Projects\51\33279\GIS\Maps\Deliverables\51_33279_Z002_ValidationSamples.mxd

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

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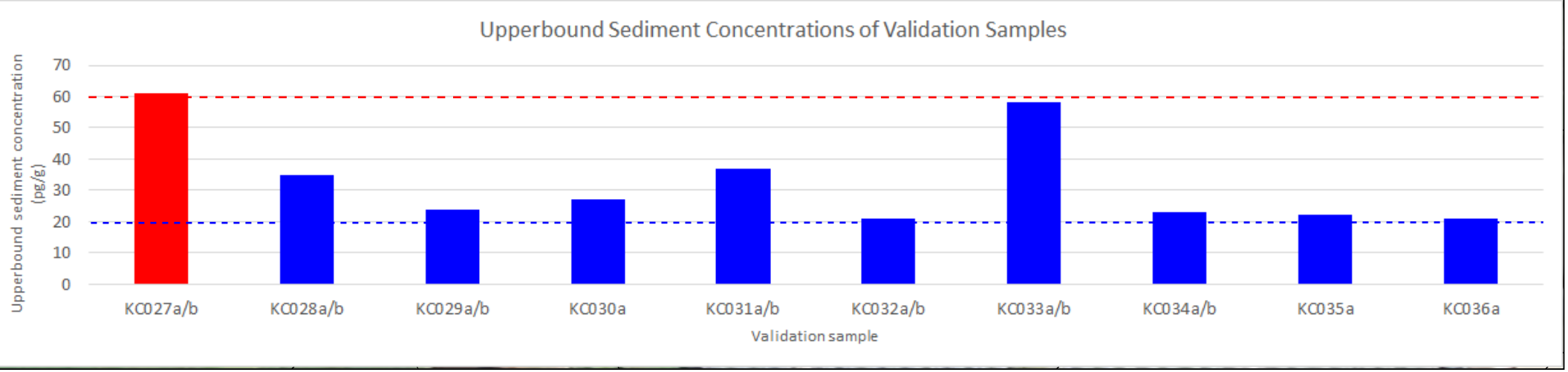

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Metres

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

LEGEND

- Validation samples (upperbound sediment concentration < 60 pg/g)
- Validation samples (upperbound sediment concentration > 60 pg/g)
- Property boundary

Canal Sediment Validation 95% UCL of 36.52 pg/g
Remedial target = 60 pg/g

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Validation Samples

Figure 4

N:\NZ\Auckland\Projects\51\33279\GIS\Maps\Deliverables\51_33279_Z002_ValidationSamples.mxd

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

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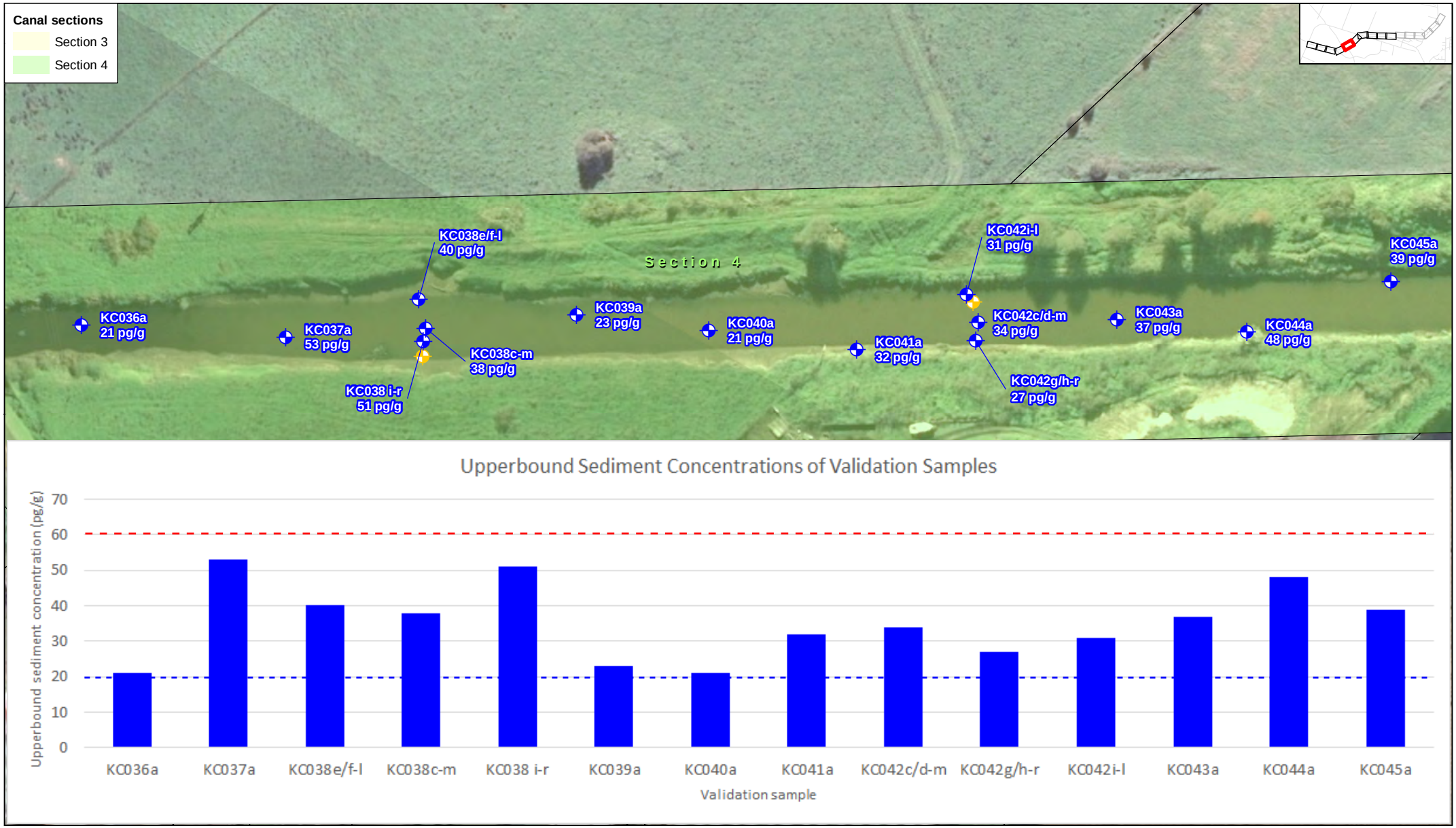

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Metres

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

LEGEND

- Validation samples (upperbound sediment concentration < 60 pg/g)
- Superseded historic validation samples prior to redredge
- Property boundary

Canal Sediment Validation 95% UCL of 36.52 pg/g
Remedial target = 60 pg/g

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Kopeopeo Canal Remediation Project

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Validation Samples

Figure 5

N:\NZ\Auckland\Projects\51\33279\GIS\Maps\Deliverables\51_33279_Z002_ValidationSamples.mxd

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

Data source: Aerial imagery - LINZ 2017 & ESRI 2019; General topo - LINZ 2018; Validation samples - Golder. Created by:jrprice

Paper Size A4

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Metres

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

LEGEND

- Validation samples (upperbound sediment concentration < 60 pg/g)
- Superseded historic validation samples prior to redredge
- Property boundary

Canal Sediment Validation 95% UCL of 36.52 pg/g
Remedial target = 60 pg/g

Bay of Plenty Regional Council
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Date	14 Mar 2019

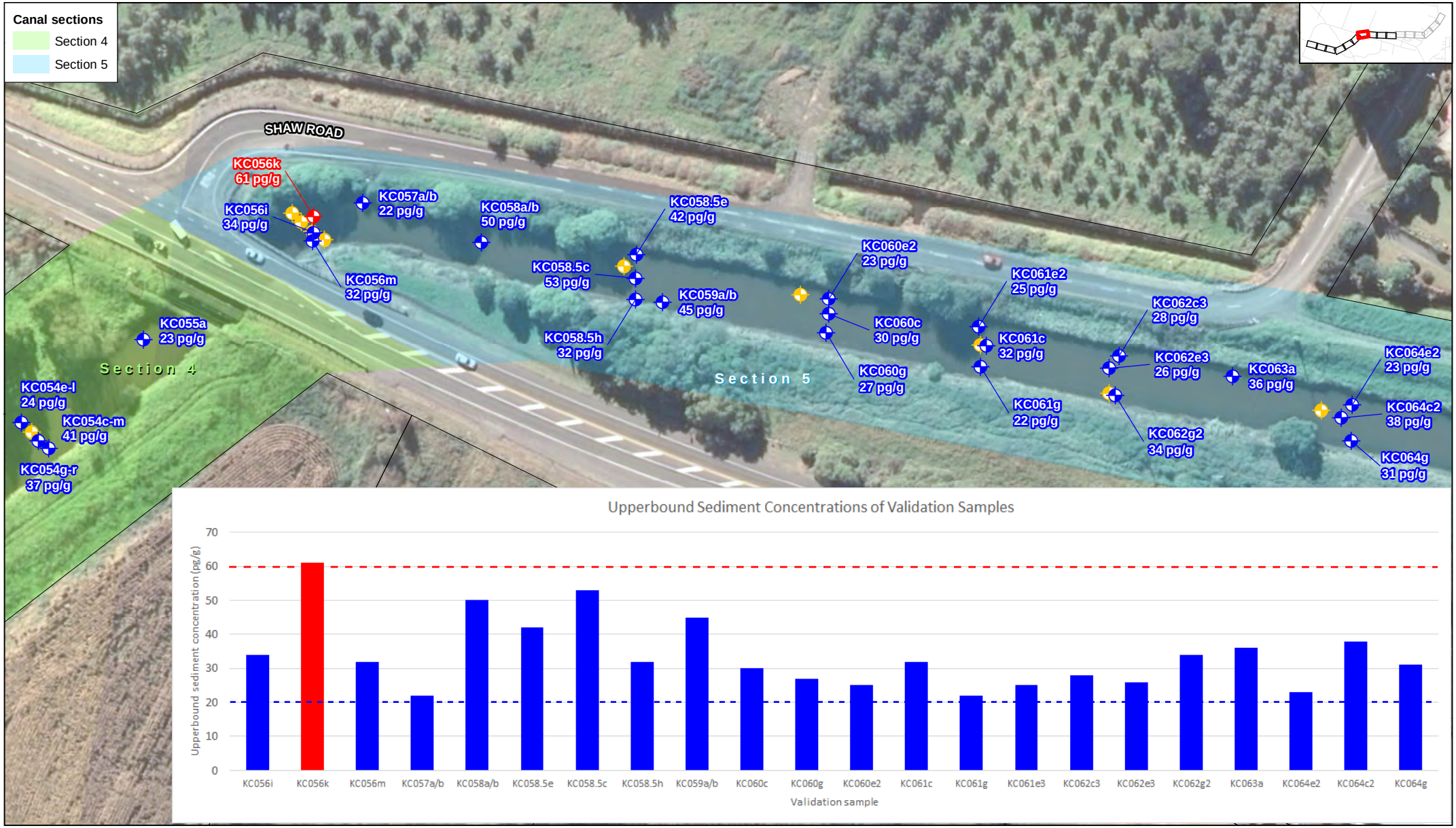
Validation Samples

Figure 6

N:\NZ\Auckland\Projects\51\33279\GIS\Maps\Deliverables\51_33279_Z002_ValidationSamples.mxd

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

Data source: Aerial imagery - LINZ 2017 & ESRI 2019; General topo - LINZ 2018; Validation samples - Golder. Created by:jrprice



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Metres

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

N

LEGEND

- Validation samples (upperbound sediment concentration < 60 pg/g)
- Validation samples (upperbound sediment concentration > 60 pg/g)
- Superseded historic validation samples prior to redredge
- Property boundary

Canal Sediment Validation 95% UCL of 36.52 pg/g
Remedial target = 60 pg/g

Bay of Plenty Regional Council
Kopeopeo Canal Remediation Project

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Validation Samples

Figure 7

N:\NZ\Auckland\Projects\51\33279\GIS\Maps\Deliverables\51_33279_Z002_ValidationSamples.mxd

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

Data source: Aerial imagery - LINZ 2017 & ESRI 2019; General topo - LINZ 2018; Validation samples - Golder. Created by:jrprice

Paper Size A4

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Metres

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

N

LEGEND

- Validation samples (upperbound sediment concentration < 60 pg/g)
- Validation samples (upperbound sediment concentration > 60 pg/g)
- Superseded historic validation samples prior to redredge
- Property boundary

Canal Sediment Validation 95% UCL of 36.52 pg/g
Remedial target = 60 pg/g

Bay of Plenty Regional Council
Kopeopeo Canal Remediation Project

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Date	14 Mar 2019

Validation Samples

Figure 8

N:\NZ\Auckland\Projects\51\33279\GIS\Maps\Deliverables\51_33279_Z002_ValidationSamples.mxd

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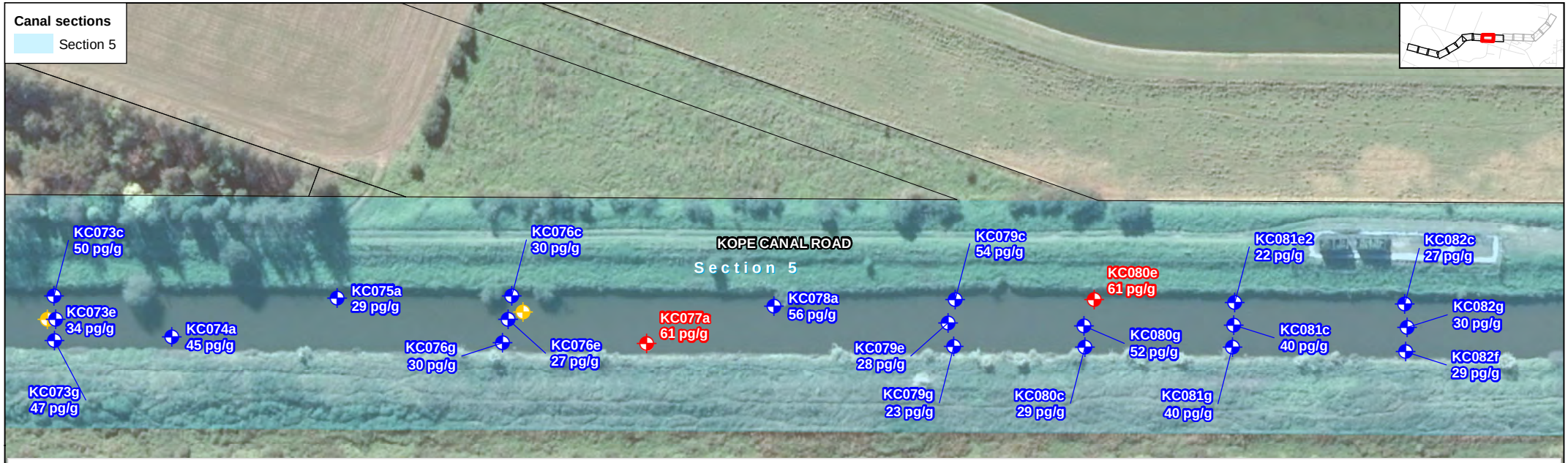

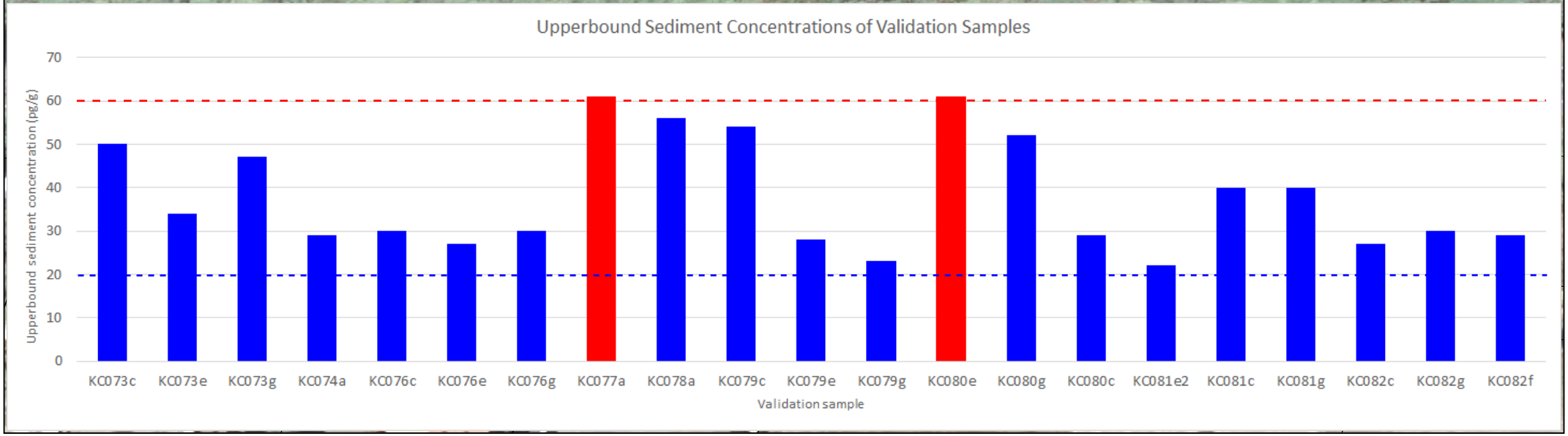

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Metres

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

N

LEGEND

- Validation samples (upperbound sediment concentration < 60 pg/g)
- Validation samples (upperbound sediment concentration > 60 pg/g)
- Superseded historic validation samples prior to redredge
- Property boundary

Canal Sediment Validation 95% UCL of 36.52 pg/g
Remedial target = 60 pg/g

Bay of Plenty Regional Council
Kopeopeo Canal Remediation Project

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Revision A
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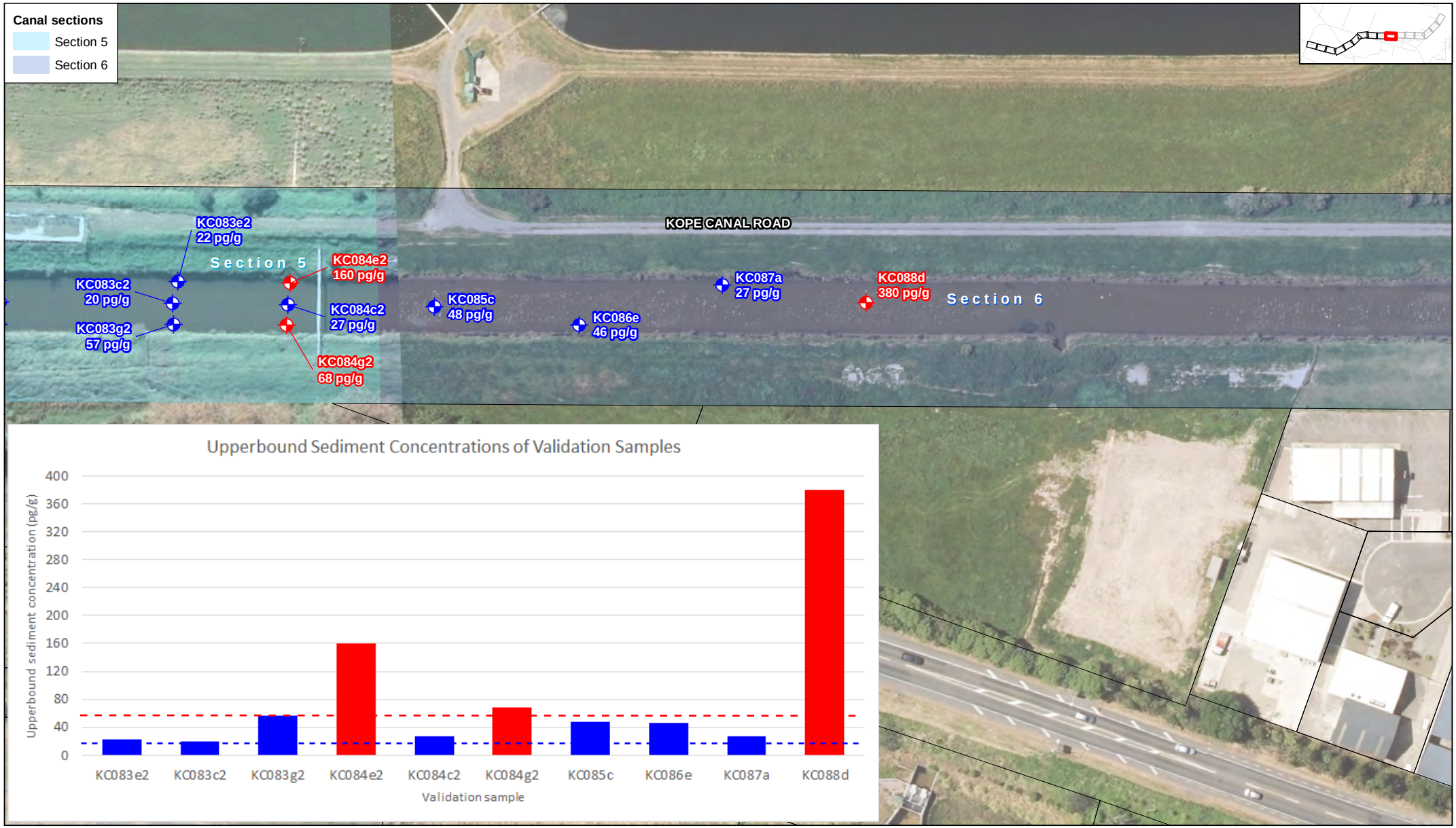
Validation Samples

Figure 9

N:\NZ\Auckland\Projects\51\33279\GIS\Maps\Deliverables\51_33279_Z002_ValidationSamples.mxd

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

Data source: Aerial imagery - LINZ 2017 & ESRI 2019; General topo - LINZ 2018; Validation samples - Golder. Created by:jrprice



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

N

LEGEND

- Validation samples (upperbound sediment concentration < 60 pg/g)
- Validation samples (upperbound sediment concentration > 60 pg/g)
- Property boundary

Canal Sediment Validation 95% UCL of 36.52 pg/g
Remedial target = 60 pg/g

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Validation Samples

Figure 10

N:\NZ\Auckland\Projects\51\33279\GIS\Maps\Deliverables\51_33279_Z002_ValidationSamples.mxd

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Data source: Aerial imagery - LINZ 2017 & ESRI 2019; General topo - LINZ 2018; Validation samples - Golder. Created by:jrprice

GHD

Level 3, GHD Centre
27 Napier Street
T: 64 9 370 8000 F: 64 9 370 8001 E: aklmail@ghd.com

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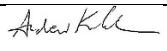
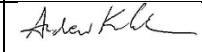
Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1.0	M. James	A. Kohlrusch		A. Kohlrusch		28/03/19

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