Western Isthmus Water Quality Improvement Project Motions Catchment Improvements

Contaminated Land Management Plan (CLMP)

Watercare Services Ltd

Reference:

Revision: A

07-July-2025

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Document control record

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Document control						aurecon
Report title		Contaminated Land Management Plan (CLMP)				
Document code		521290-W00064-REP-EC-0003	**Project number**		521290-064	
File path		Https://aurecongroup.sharepoint.com/sites/521290-064/3_Develop/For Delivery/521290-W00064-REP-EC-0003.docx				
Client		Watercare Services Ltd				
Client contact		John Stokes / William Hung	**Client reference**		521290-064	
Rev	**Date**	**Revision details/status**	**Author**	**Reviewer**	**Verifier**	**Approver**
A01	2025-06-13	Issue for Client Review - Submission with Resource Consent Application	H.Sussex/ M. Gamman	M. Tendam *Cenvp-Sc*		A. Hodgson
A	2025-07-07	Issue as Final	H.Sussex	M.Gamman	M. Tendam *Cenvp-Sc*	M.Cobeldick
Current revision		**A**				

Approval			
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Glossary of abbreviations

Glossary of abbreviations	
AC	Auckland Council
ACM	Asbestos containing material
ARCP	Asbestos removal control plan
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
COPC	Contaminant of Potential Concern
CSM	Conceptual site model
CLMP	Contaminated land management plan
CWA	Construction working areas
DSI	Detailed Site Investigation
ESCP	Erosion sediment control plan
EMP	Environmental management plan
FA/AF	Friable asbestos/Asbestos fines
g / m3	grams per cubic metre
HAIL	Hazardous activities and industries list
HDPE	High-density polyethylene
HSP	Health and Safety Plan
ID	Internal diameter
LED	lower explosive limit
m	metre
m^2 or m^3	Metres squared or metres cubed
m bgl	metres below ground level
MFE	Ministry for the Environment
NES-CS	Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
OCP	Organochlorine pesticides
PAHs	Polycyclic aromatic hydrocarbons
PCBU	Person conducting a business or undertaking
PID	Photo-ionisation detector
PSI	Preliminary Site Investigation
PPE	Personal protective equipment
SQEP	Suitably qualified and experienced practitioner
SPR	Source -receptor-pathway
SS	Soil sample
SVR	Site Validation Report
TBD	To be determined

Glossary of abbreviations	
TBM	Tunnel boring machine
TPH	Total petroleum hydrocarbon
WCR	Work Completion Report
WIWQIP	Western Isthmus Water Quality Improvement Project

Contaminated land management plan revision process

Table 1 sets out the revision process for updating this draft Contaminated Land Management Plan (referred to herein as CLMP) for the Western Isthmus Water Quality Improvement Programme (WIWQIP) - Motions Catchment Improvements Project (referred to herein as 'the Project').

Table 1 CLMP revision process for the Motion Project

CLMP revision process	Discussion	CLMP suitability
For resource consent application	This CLMP has been prepared following the outcomes of a Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI) completed as part of Concept Design for the Project (refer Section 1 for further details). This CLMP is to be submitted to consenting authority (Auckland Council (AC)) as part of the overall resource consent application being sought by Watercare for the Project.	**Yes**
For Issue with the- Design and Construct (D&C) Tender Package	By this point a resource consent for the Project may still be pending approval however the tender package is ready to be released to the market. At this point, the Principal Contractor is still unknown, and it may not be confirmed as to whether the Contaminated Land Suitably Qualified Environment Practitioner 'SQEP' appointed to support consenting will be retained by Watercare for the design and construction phase, or that risk will be placed on the contractor who will need to engage their own SQEP. Once the D&C contract is awarded, the following shall be considered by the D&C contractor: ■ Any additional not available during the resource consent process. ■ Any changes to required controls based on changes to methodology. ■ Confirmation of dewatering methodology. ■ Agreed spoil stockpile laydown areas within the construction. ■ Any outstanding risk items or uncharacterised contamination conditions.	**Yes**
For Earthworks / Construction	The Principal Contractor is appointed, SQEP is confirmed, design complete and construction methodology agreed. Typically, this version of the CLMP will be finalised, with the following specific information included: ■ Final names and contact information for all roles in Section 3. ■ Any additional information not available during the resource consent and tender process. ■ Any changes to required controls based on changes to methodology. ■ Confirmation of dewatering methodology. ■ Agreed spoil stockpile laydown areas within the construction. ■ Any outstanding risk items or uncharacterised contamination conditions. ■ All necessary approvals obtained for construction, especially within Basque Park -a high risk closed landfill site. This version of the CLMP will be sent to the consenting authority (Auckland Council) prior to works commencing in accordance with the Project resource consent timeframes for final certification/approval. If the SQEP appointed to manage works through the construction process differs from the SQEP used to procure consent and/or tender contract, a final CLMP will be prepared by the new SQEP unless agreed as part of the tendering process.	**The current version of the CLMP is not suitable for construction**

1 Introduction

1.1 Project background

Aurecon New Zealand Limited (Aurecon) has been engaged by Watercare Services Limited (Watercare) to prepare a draft Contaminated Land Management Plan (referred to herein as 'CLMP') for the proposed Western Isthmus Water Quality Improvement Programme (WIWQIP) - Motions Catchment Improvements Project (referred to herein as 'the Project').

The Project comprises a collector sewer which essentially duplicates the alignment of Watercare's existing Branch 7 sewer along State Highway 16 from the Central Motorway Junction in Central Auckland to Western Springs where it will connect with the main Central Interceptor tunnel. The Motions collector sewer comprises a 3.2 km long, pipeline which will be constructed using a micro-tunnel machine (also known as pipe jacking machine), with an internal diameter (ID) up to 2.4m or tunnel boring machine (TBM), with ID 3.0 m up to 4.5 m. The exact construction methodology is yet to be confirmed for the Project. There are 15 construction shafts proposed for the Motions collector sewer, varying in size 6 m to 10 m ID and depths of 6 m to 31 m, dependent of its purpose (i.e. launching (larger) or receiving (smaller) machinery and equipment or for future operations and maintenance). Refer to Figure 1 for Project extent.

The estimated soil disturbance area for the 15 shaft locations, based on Concept Design (ID of 1.8m)[1] is anticipated to be approximately 13,610m^2, with estimated excavated material volume (for shaft construction spoil, excluding tunnel spoil[2]) of approximately 24,000m^3. The finalised earthworks volumes are likely to vary dependent on the confirmed construction methodology.

This CLMP has been prepared for 'contaminated materials management' associated with the construction of the 15 shafts and construction working areas (CWAs) where previous investigations have established minor effects at shafts SH03, SH05, SH06, SH07, SH04, SH09, SH10 and SH11 and more than minor effects at shafts SH02, SH13, SH14 and SH15. Refer Section 2 for further details.

This version of the CLMP supports the Project's resource consent application and demonstrates, at a high level, that any adverse environmental contamination effects can be managed. A final CLMP revised with the Principal Contractor's terms will be required for approval and certification, as described in Table 1.

[1] Aurecon,2025. Concept Design Report. Rev A. Issued to Watercare: 7 March 2025. Aurecon Report Reference: 521290-W00064-REP-WA-0002.
[2] Pipeline alignment construction management, including protocols and procedures for slurry management will form part of the Construction Management Plan and is not covered as part of this CLMP[2].

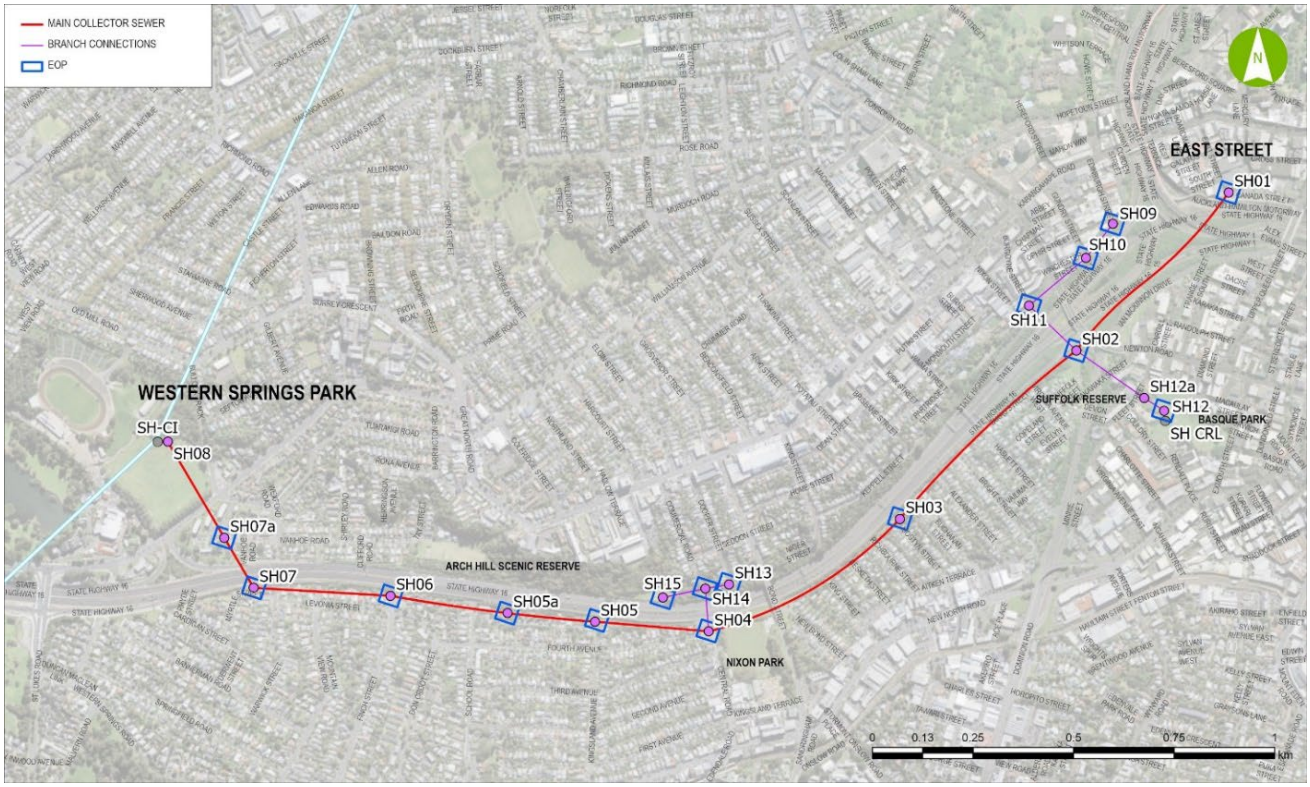

Figure 1 Project extent

1.2 CLMP purpose

The key purpose of the CLMP is to ensure that any potentially adverse effects from the Project's earthworks are managed and mitigated. The CLMP focuses on protecting:

- The health of workers;
- The on-site environment; and
- The off-site environment (including the health of surrounding residents, where needed).

This CLMP informs the Principal Contractor[3] of the requirements for the management of contaminated materials. It does not describe all issues required to manage earthworks effectively, and it is intended that this CLMP be incorporated into a relevant Construction Management Plan or equivalent by the Principal Contractor.

The CLMP covers the following:

1. A summary of proposed works (Section 4);
2. A summary of contamination risks established from previous investigations completed for the Project, including key management strategies for the works (Section 2);
3. Contact information and a summary of specified roles for the client, consultant and contractors engaged to work on this Project (Section 3);
4. Site and environmental management procedures including protocols for any unexpected contamination discovery (Sections 4 and 5);
5. Health and safety protection measures (Section 6);
6. Requirement for additional testing for areas not investigated, if applicable, including requirements for imported fill and waste disposal (Section 7);
7. Works completion reporting requirements for regulatory authorities (Section 8); and
8. On-going monitoring and management if required.

[3] Principal contractor and/or established roles for the earthworks and construction phase for the Project.

This CLMP should be used to inform the Project's risk assessment register and updated throughout the Project's construction and commissioning (consenting, detailed design, tender as shown in Table 1) to reflect any changes to site conditions by the Principal Contractor.

This CLMP is restricted to the management of contaminated soil and/or water and should not be used to replace any other site management processes that are required and/or will need to be in place during the construction phase for the Project.

Where the processes defined in this CLMP are in direct conflict with consent conditions, advice should be sought from both the consent issuing authority (Auckland Council (AC)) and the suitably qualified and experienced practitioner (SQEP).

The CLMP has been prepared to meet the requirements of the Ministry for the Environment (MfE) national environmental standard for assessing and managing contaminants in soil (NES-CS)[4] with reference to the *Contaminated Land Management Guidelines No. 1 (CLMG No 1)*[5].

1.3 Explanatory statement

1.3.1 Review and scope

The following limitations are noted:

- Only a limited amount of information has been collected and this CLMP does not purport to completely describe all the Project characteristics, properties and hazards. The nature and continuity of the ground between test locations has been inferred using experience and judgment and it must be appreciated that actual conditions could vary from the assumed conditions. Should further information become available regarding the conditions in the site, including previously unknown likely sources of contamination, Aurecon reserves the right to review this CLMP in the context of the additional information.
- This CLMP makes various assumptions from the data collected, and while providing a framework for managing the contamination hazards, it only presents a summary of identified hazards and mitigation measures relevant to the expected site conditions. Aurecon accepts no responsibility for any deviations from the CLMP which may result in harm to the site workers, damage to the environment or breaches of the consent.
- The CLMP is also based on information provided to Aurecon by Watercare. It is provided strictly on the basis that the information that has been provided is accurate, complete and adequate. Aurecon takes no responsibility and disclaims all liability whatsoever for any loss or damage that Watercare or any other party may suffer resulting from any conclusions based on information provided to Aurecon, except to the extent that Aurecon expressly indicates in the CLMP that it has verified the information to its satisfaction.
- This CLMP does not include any assessment or consideration of potential health and safety issues under the Health and Safety at Work Act 2015.

[4]Ministry for the Environment, 2021, *National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.*

[5]Ministry for the Environment, 2021, *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand*, ME 1071, Revised Draft.

2 Potential contamination sources and management strategies

2.1 General

This CLMP has been prepared based on the findings from the Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI) completed for the Project as part of Concept Design. The following sections presents the key findings.

2.1.1 Preliminary site investigation

A Preliminary Site Investigation (PSI) report was prepared for the Project entitled: WIWIP Motions Catchment Improvements, Preliminary Site Investigations, dated 13 June 2025, Rev B01 (*Aurecon report reference: 521290-W00064-REP-EC-0001*).

The PSI assessed current and/or historical activities with the potential to have caused soil and/or groundwater contamination which could potentially impact the Project and constrain design and/or construction. A preliminary conceptual site model (PCSM) prepared as part of the PSI identified the following hazardous activity and industrial sites (HAIL) with '*potentially complete*' and '*complete*' source- pathway-receptor (SPR) linkages (effects):

- HAIL G3 (closed landfills);
- HAIL H (migration of contaminants from adjacent activities);
- HAIL I (contamination present in sufficient quantity); and
- Road corridors (not considered HAIL but subject to HAIL activities such as significant fill material).

Refer Figure 2 for SPR linkages.

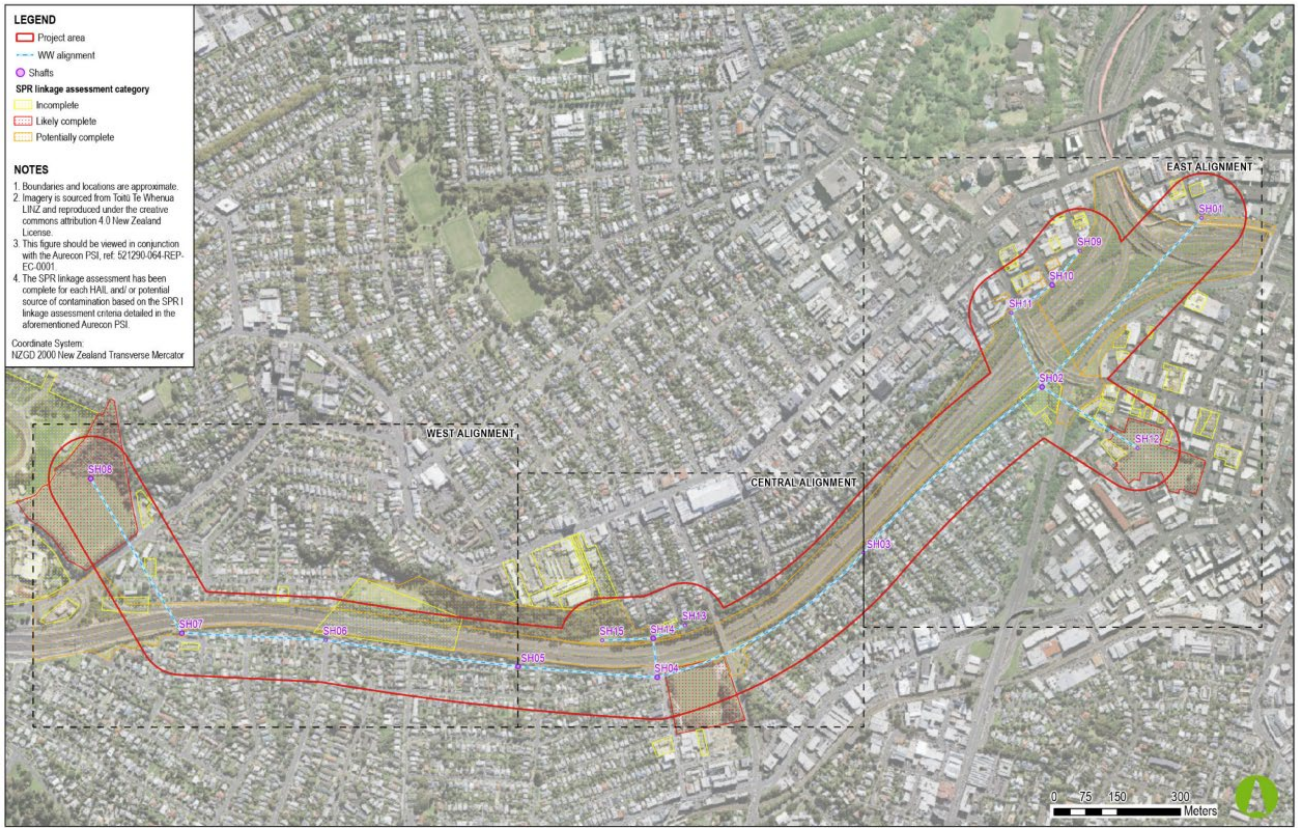

Figure 2 SPR linkages established based on PSI outcomes

2.1.2 Detailed site investigation

A Detailed Site Investigation (DSI) was completed following outcomes of the PSI to provide a preliminary appraisal of ground conditions for the HAIL activities identified and to inform any implication on design and/or construction, including resource consent requirements for the Project. This has been provided in report entitled: WIWIP Motions Catchment Improvements, Detailed Site Investigations, dated 4 July 2025, Rev B (*Aurecon report reference: 521290-W00064-REP-EC-0002*).

A total of 69 soil samples (SS) from 19 borehole (BH) locations and 11 groundwater (GW) samples, including additional quality control/quality assurance (QA/QC) samples were collected to target contaminants of concern (COC) associated with HAILs for the Project. The Ground Investigation Programme (GI) for the DSI primarily focused on shaft locations (SH01 -SH15), where the greatest exposure to potential soil and groundwater during construction and excavation is anticipated.

The following summaries the key findings and recommendations from the DSI:

- The GI confirmed no contaminant exceedances in soil or groundwater above the adopted human health criteria. Some exceedances above the adopted environmental and ecological criteria and Auckland background soil concentration were established for the Project;
- Groundwater was measured between 0.5 m to 8.52 m at the shaft locations and will be intercepted during shaft construction. Dewatering will be required to facilitate construction;
- The soil and groundwater analytical results from the GI was utilised to produce an updated conceptual site model (CSM) to establish the following source-pathway- receptor (SPR) linkages for the Project:
  - '*Incomplete SPR linkages*' at SH03, SH05, SH06, SH07 (associated with HAIL I), SH04 (associated with HAIL G3) and SH09, SH10 and SH11 (associated with HAIL H).
  - '*Potentially complete SPR linkages*' at SH01 (associated with HAIL I and no GI), SH12 and SH12A associated with HAIL G3) and SH08 (HAIL I and limited GI).
  - '*Complete SRP linkages*' at SH02 (associated with HAIL I) and SH13, SH14 and SH15 (associated with HAIL G3[6]).

Figure 3 provides a visual summary of the SPR linkages established for the Project.

[6] Complete SPR linkages based on exceedance of adopted Permitted Activity criteria and waste disposal criteria. However, these can be managed as part of construction phase management. Refer Table 2.

Figure 3 SPR Linkages established following DSI outcomes

2.2 Site management strategies

Table 2 provides a summary of contaminated materials management strategies proposed to mitigate adverse effects during the construction phase for the Project. Refer Figure 4 for a visual summary of construction management areas established for the Project.

Contaminated materials specifications for the Principal Contractor based on the strategies presented in this CLMP is provided for each shaft location in Attachment A. These are to be updated as required for the For Construction-CLMP following the revision process provided in Table 1.

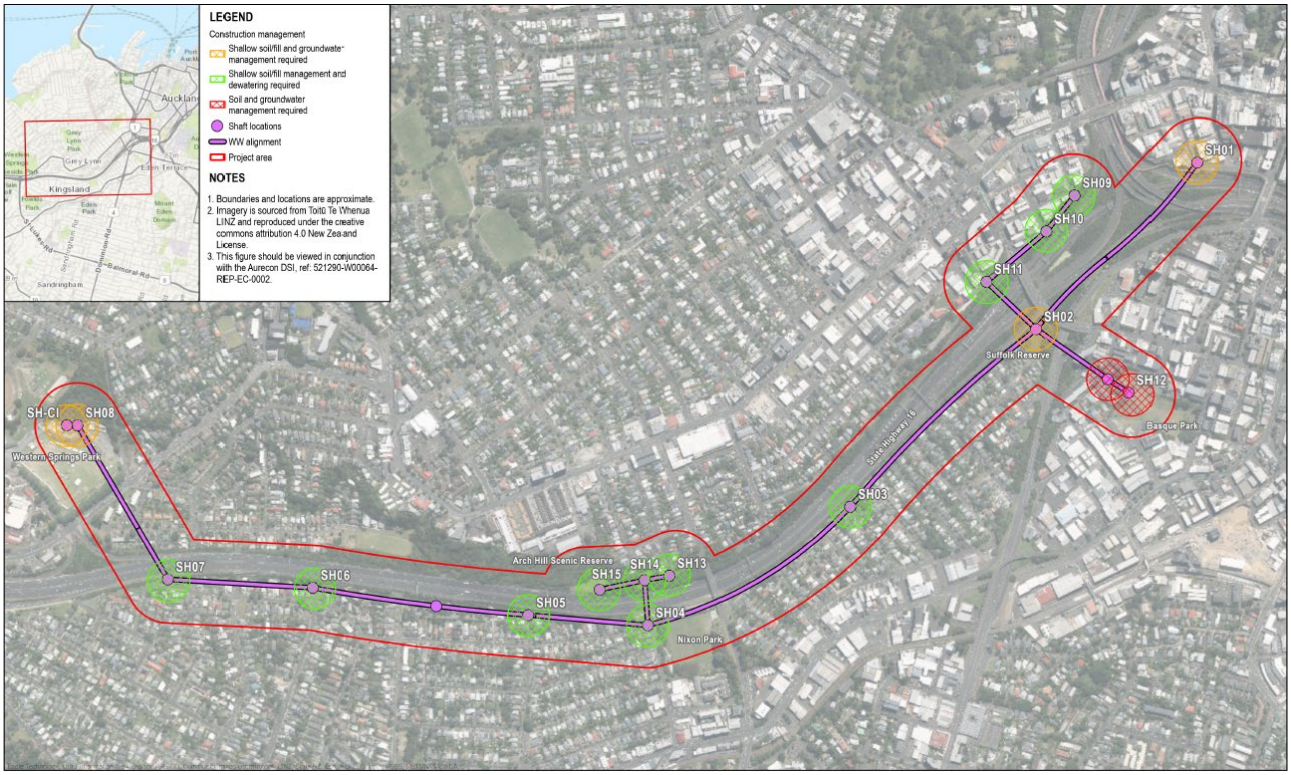

Figure 4 Construction management areas established based on DSI findings

Table 2 Soil and water management strategies

Shaft	HAIL classification based on PSI and DSI	SPR linkages confirmed by soil and analytical data (refer DSI)	Construction management for soil and groundwater	Summary of management options [1,2,3]	CLMP reference
SH01	HAIL I (uncontrolled fill material)	Potentially complete	Although no intrusive ground investigation was completed at SH01, there is existing ground contamination data available from the City Rail Link (CRL) project that can be utilised to inform SH01. As detailed in the Aurecon PSI report (Ref: 521290-W00064-REP-EC-0001), a Tier 2 ground investigation was undertaken for a 3.4 km underground railway system which included investigations at Karangahape Road Station (approximately 50 m north of SH01). The closest bore to the WW alignment drilled as part of this investigation was identified as BH134 (located approximately 250 m north from SH01). A review of the soil and groundwater investigation data revealed no CoC above the NES-CS (human health criteria for commercial/ industrial land use) and AUP PA criteria (Auckland background soils concentrations). Applying a precautionary and conservative approach (based on previous investigation data) shallow soil/fill management (< 2 m bgl) potentially required.	▪ General controls for earthworks (spoil handling and disposal requirements), including unexpected contamination discovery protocol are provided within this CLMP. Further soil testing to inform soil disposal maybe required, subject to confirmation with disposal facility. ▪ General controls for groundwater and stormwater provided within this CLMP. Supporting groundwater data from the City Rail Link (CRL) project, if available will be beneficial to inform construction management for SH01.	Principal Contractor - Contaminated Materials Specifications, Attachment A. Section 4, 5 and Section 7.
SH02	HAIL G3 (Suffolks Reserve – confirmed significant historic 'uncontrolled fill material' as part of the reserve development)	Complete	▪ Shallow soil/fill management (< 2 m bgl) required based on DSI findings. Brick fragments and glass shards were also encountered at SH02 (BH07) advanced at depths of 0.05 and 0.85 m bgl respectively. ▪ Groundwater management required. Dewatering of shallow groundwater during shaft construction likely required based on measured groundwater levels (0.56 m) and groundwater exceedances noted at SH02 (exceeded the ANZG DGVs for 80% protection criteria for copper, nickel, and zinc) but were below the 80% protection criteria when applying dilution and reasonable mixing.	▪ General controls for earthworks (spoil handling and disposal requirements) are provided within this CLMP. ▪ Confirmation of final resource consent conditions associated with groundwater and/or stormwater management is required for SH02.	Principal Contractor - Contaminated Materials Specifications, Attachment A. Section 4, 5 and Section 7..
SH03 SH04 SH05 SH07, SH09 SH10 SH11	SH03, SH04, SH05, SH07 (HAIL I) SH09, SH10, SH11 (HAIL H)	Incomplete	▪ Shallow soil/fill management (< 2 m bgl) required based on DSI findings. ▪ Groundwater dewatering will be required. Based on the DSI, groundwater is not impacted by concentrations of contaminants that require additional management.	▪ General controls for earthworks (spoil handling and disposal requirements) are provided within this CLMP. ▪ General controls for groundwater and stormwater provided within this CLMP.	Principal Contractor - Contaminated Materials Specifications, Attachment A. Section 4, 5 and Section 7.
SH13, SH14 SH15	HAIL G3 (Arch Hill Reserve)	Complete	▪ Shallow soil/fill management (< 2 m bgl) required based on DSI finding. ▪ Groundwater dewatering will be required. Based on the DSI, groundwater is not impacted by concentrations of contaminants that require additional management. ▪ A piece of asbestos was found on the ground surface during the DSI.	▪ General controls for earthworks (spoil handling and disposal requirements), including unexpected contamination discovery protocol are provided within this CLMP. ▪ General controls for groundwater and stormwater provided within this CLMP.	Principal Contractor - Contaminated Materials Specifications, Attachment A. Section 4, 5 and Section 7.
SH06	Potential HAIL I (fill material along Northwestern motorway)	Incomplete	▪ Shallow soil/fill management (< 2 m bgl) required based on DSI finding. Fragments of plastic, wood, concrete, and glass were also encountered within the fill material at a depth of 0.5 m bgl at SH06 (BH21). In addition, concrete (approximately 200 mm thick with a 100 mm gap) was noted on the side of the BH between 2 m to 2.5 m bgl and between 5.2 -5.4 m bgl. ▪ Groundwater dewatering will be required. Based on the data as identified in this DSI groundwater is not impacted by concentrations of contaminants that require additional management.	▪ General controls for earthworks (spoil handling and disposal requirements) are provided within this CLMP. ▪ General controls for groundwater and stormwater provided within this CLMP.	Principal Contractor - Contaminated Materials Specifications, Attachment A. Section 4, 5 and Section 7.

Shaft	HAIL classification based on PSI and DSI	SPR linkages confirmed by soil and analytical data (refer DSI)	Construction management for soil and groundwater	Summary of management options [1,2,3]	CLMP reference
SH08	HAIL G3 (Western Springs outer field has historically being subject to uncontrolled filling.	Potentially complete	Soil analytical results from BH30 and BH32 (collected from the Motions Collector Sewer BH) were below the adopted human health and, environmental and Auckland background concentration criteria. Previous investigations completed as part of the Central Interceptor tunnel project (refer PSI report Ref: 521290-W00064-REP-EC-0001) included investigations within the Western Springs outer fields (731 Great North Road) in close proximity to SH08. The soil results from this investigation also noted heavy metals, TPH and PAH below the PA and NES-CS criteria, however did encounter contaminant concentration above the Auckland background soil concentrations and cleanfill criteria. This included one soil sample with heavy metal and TPH concentrations below cleanfill criteria but detected PAHs just above the laboratory detection limit (LOD) and one asbestos sample reported chrysotile fibres at 0.5 m depth but below the human health assessment criteria of 0.001% weigh for weight (w/w). Applying a precautionary and conservative approach (although no contamination identified for the WW pipe alignment BHs drilled, previous investigations completed did encounter shallow contamination), shallow soil/fill management (< 2 m bgl) will be required.	▪ General controls for earthworks (spoil handling and disposal requirements), including unexpected contamination discovery protocol are provided within this CLMP. Further soil testing to inform soil disposal maybe required, subject to confirmation with disposal facility. ▪ General controls for groundwater and stormwater provided within this CLMP. Supporting groundwater data from the Central Interceptor project, if available will be beneficial to inform construction management for SH08.	Principal Contractor - Contaminated Materials Specifications Attachment A. Section 4, 5 and Section 7.
SH12 SH12A	HAIL G3 (confirmed historic closed landfill at Basque Park)	Potentially complete	Given the location of SH12 and SH12A within a closed landfill area, construction management is required for soil and water (stormwater & groundwater) during construction, in accordance with the Asset Owner Approval (AOA). No refuse or leachate was encountered in any of the boreholes advanced at Basque Park. However uncontrolled fill material (as confirmed by the PSI report and AOA) was also identified in the boreholes advanced at Basque Park. In general, plastic pieces, glass and ceramic fragments, a metal peg, a piece of fabric, including trace brick fragments was intermixed within the predominately silt and clay fill layer at depths between 0.15 and 3.7 m bgl, respectively. Black discolouration/staining with no odour was also encountered at a depth of 1.25 m bgl to 1.35 m bgl, including a 5 mm black discolouration/staining, with a burnt like odour at 2.4 m bgl. One soil collected at SH12A (BH43_0.5-0.6, 7.8 mg/kg, adopted criteria 1.2 mg/kg) analysed for analyte pyrene also exceeded the MfE petroleum guideline-soil acceptance criteria for protection of groundwater to the depth of 2 m bgl (for clay soil type). However, GW samples collected from SH12A identified pyrene concentrations to be within the ANZG DGVs for 80% protection criteria.	▪ Works in accordance with final resource consent conditions stipulated in the AOA and final resource consent conditions. ▪ Controls for earthworks (spoil handling and disposal requirements), groundwater and stormwater are provided within this CLMP.	Principal Contractor - Contaminated Materials Specifications Attachment A. Section 4, 5 and Section 7.

Notes:

1. Management options are not presented in order or preference and shall be considered in the context of the works, detailed design confirmation and preferred construction methodology for the Project.
2. Management options shall be reviewed in the context of any changes to understanding of site conditions (i.e. new ground investigation data and change in ground conditions etc) and following the CLMP revision process provided in Table 1.
3. Management options provided in this table may considered may require adjustment/updating to reflect any consent conditions, once granted.

Maps and overlays for other plans for the Project

Contaminated materials specifications for the Principal Contractor based on the strategies presented in this CLMP is provided for each shaft location in *Attachment A*. These are to be updated as required for the For Construction-CLMP following the revision process provided in Table 1.

3 Roles and responsibilities

All employees engaged in construction activities and under the direct control of the Principal Contractor shall comply with the requirements of this CLMP. Definitions of roles and responsibilities are provided in Attachment B.

Roles assigned to key Project personnel are identified in Table 3.

Table 3 Project roles and responsibilities

Tasks	Organisation	Name	Email	Phone
Distribution of this CLMP to the Principal Contractor & ensuring compliance with resource consent conditions and CLMP certification/compliance	Watercare	TBD	TBD	TBD
Updating the CLMP Providing guidance for unexpected discoveries Contaminated land technical reporting	Environmental consultant (SQEP)	TBD	TBD	TBD
Implementation of the CLMP	Principal Contractor	TBD	TBD	TBD
	Site manager	TBD	TBD	TBD
	Earthworks contractor	TBD	TBD	TBD
Review of the CLMP Production of site-specific erosion and sediment control plan	Principal Contractor	TBD	TBD	TBD
Emergency response contact information				
Auckland Council – compliance officer			-	09 354 8700
Auckland Council pollution response hotline			-	09 377 3107
WorkSafe NZ			info@worksafe.govt.nz	0800 030 040
National Poisons Centre			https://poisons.co.nz/	0800 764 766

4 Site management procedure

Table 4 presents the general site management requirements for contaminated material management for the Project.

Table 4 Site management procedure

Item	Requirement
Consents and plans	Prior to commencing works ensure: ■ All necessary resource consent(s) have been obtained. ■ Ensure the approved and certified CLMP for the Project is utilised for the works. ■ Ensure the AOA is obtained from Auckland Council for construction of SH12 and SH12A. ■ Ensure other plans referenced in the CLMP, such as Dewatering Plan, ESCP and Construction Management Plan are cross-referenced to ensure compliance during earthworks.
Site record keeping and monitoring requirements	Records which should be kept by the Principal Contractor associated with SH01 to SH15 during the works, noting any matters associated with contaminated material management, including: ■ Site conditions. ■ Condition and replacement of erosion and sediment control measures, if applicable. Any further requirements for analysis of soil samples for disposal acceptance purposes (refer Section 7). Environmental discussions, incidents, and non-compliance issues with resource consent conditions relating to contaminated material management. Spoil disposal records/tipping dockets required for works completion report (refer Section). Information of the source / site / sample results from any imported clean material for the works (refer Section 7). Any other relevant information to aid the works completion report and compliance requirements (refer Section 8).
Induction and awareness	The Principal Contractor shall ensure the following: ■ All site workers are inducted onto the certified and approved CLMP. ■ All staff are aware of spoil tracking requirements, including retaining disposal records/tipping dockets for inclusion into a works completion report/site validation report. ■ A site plan at each construction working areas (CWA), showing locations of temporary stockpiles (for contaminated spoil only), if applicable are clearly identified. ■ All details are recorded of unexpected contamination and hazardous materials discovery.

5 Environmental management procedure

Table 5 provides the environmental controls required to minimise any potential adverse effects on the environment during construction.

Table 5 Environmental management

Item	Requirement
Excavation, transportation and disposal of spoil	The following controls shall be adhered to during the excavation and transportation of excavated spoils for the Project: ■ Sediment and erosion control established in each construction working area. ■ Trucks shall be loaded within the confines of the CWAs, where stormwater runoff and potential spills during loading are able to be controlled and contained. ■ All materials removed from CWAs will be transported to a suitably licensed facility for disposal as established for the shaft locations and depths (refer Table 8). ■ All trucks will be securely covered with close fitting tarpaulins (if contaminated). ■ All materials leaving the CWAs will be tracked by way of weighbridge dockets which include the disposal location and the weight of the load.
Erosion and sediment control and ESCP	An ESCP, prepared in accordance with resource consent conditions and Auckland Council's 'erosion and sediment control guide for land disturbing activities in the Auckland Region (GD05)' will be in place for protection of stormwater and receiving environment. Where stockpiling of excavated spoil is required and soil contamination established to a certain depth (refer Table 8), refer to stockpiling below for further details. The ESCP will be available at the CWAs at all times during the earthworks and is to be reviewed and amended if required upon the commencement of, and during, the works.
Stockpiling	Stockpiling of contaminated / odorous soil should be avoided where possible during the works. However, if stockpiling is required, the following management options are considered appropriate for the mitigation of potential hazards arising from the creation of potentially contaminated stockpiles for the Project: ■ Located within a designated area, as specified in the ESCP. ■ Prior to forecast rainfall, stockpiles shall be covered to prevent discharges form the stockpiles. Covered with heavy duty plastic, such as high-density polyethylene (HDPE). ■ Located on an impermeable surface (e.g. concrete or tarmac/asphalt hardstand, heavy duty plastic). ■ Bunds or sediment fences will be constructed or installed around the edges of the stockpile management area to prevent storm water run-off from carrying contaminated or potentially contaminated soil away from the stockpile management area. ■ Removed within six weeks. Imported fill required for backfilling excavations may be temporarily stockpiled in a designated, clean area on-site. All imported fill is required to be free of contaminants.
Dust and odour management controls	Excavation, stockpiling, movement of plant and transport of soil may generate dust and/or release odours. The generation of dust and odour will be minimised by the following: ■ Suspending or limiting excavation, stockpiling and transport of spoil during periods of high wind. ■ Limiting speed of travel on site. ■ Limiting transport routes across site to designated haulage routes. ■ Using a water spray on exposed soil to dampen soil. ■ Covering areas of exposed soil with sheeting / tarpaulins. ■ Ensuring trucks transporting material from the site are covered (if contaminated) and that vehicles including tyres are adequately cleaned of dirt before leaving site. Any

Item	Requirement
	material tracked off-site shall be cleaned up immediately and disposed of appropriately.
Groundwater management and dewatering	Dewatering is required for shaft construction. Based on the DSI findings, except for SH01 and SH08 (refer Table 2) groundwater is not impacted by concentrations of contaminants that require additional management. Standard controls stipulated in the CLMP are sufficient for management groundwater (subject to finalised resource consent conditions). Seek SQEP advice for unexpected contamination during dewatering.
Imported material	Any soil materials imported for the purpose of reinstating the ground, should be suitable to comply with the definition of 'cleanfill', as per the WasteMINZ guidelines[7].

5.1 Unexpected contamination discovery protocol

Table 6 presents protocols to manage unexpected contamination in the event unexpected contamination is discovered during the works. This procedure provides the Principal Contractor with protocols to address unforeseen contamination and take appropriate action to avoid the dispersion of potential contaminants into the surrounding environment.

Table 6 Unexpected contamination discovery protocol

Item	Requirement		
Contamination Indicators	Contamination discoveries include the presence of discoloured surface water (including sheens or slicks), unusual odours, gas bubbles in pooled surface water, oily substances, intact or broken drums / containers / tanks, unencountered waste or fibrous materials such as fibre cement which may contain asbestos.		
Contact Information	**Contact**	**Email**	**Phone**
	SQEP	TBD	TBD
	Auckland Council	-	09 301 0101
	Auckland Council Pollution Hotline	-	09 377 3107
	WorkSafe NZ	info@worksafe.govt.nz	0800 030 040
	National Poisons Centre	https://poisons.co.nz/	0800 764 766

[7] WasteMINz, 2023. Waste Management Institute New Zealand (WasteMINZ) document titled 'Technical Guidelines for Disposal to Land' – Revision 3.1.

Item	Requirement
Process	During earthworks on the site, the Principal Contractor shall actively monitor ground conditions for the conditions/materials specified above. If newly discovered contaminated material is encountered, earthworks and dewatering (if occurring) must stop in the area. The material must remain in situ until the SQEP has had the opportunity to assess and test the material, and to provide advice on how to proceed. The SQEP shall: ■ Notify Auckland Council, if required. ■ Characterise the contaminated material by collecting samples for laboratory analysis. ■ Prepare a Remedial Action Plan (RAP), if required. ■ If appropriate, advise the contractor to excavate the suspected contaminated material into a covered and contained receptacle to allow works to continue with minimum delay. ■ When the material or water characteristics have been established by the SQEP, they will advise the Principal Contractor as to whether the: – Materials may remain on site or be directly loaded into trucks for disposal at an appropriately licensed waste facility; – Water may be discharged with or without additional treatment, or whether any site dewatering from the excavation should be collected for disposal at a wastewater facility licensed to receive the water; and – Disposal of material must be to a facility licensed to accept such material and approval shall be obtained by the Principal Contractor prior to transportation. The landfill operator may require further testing before accepting materials, in accordance with the landfill's resource consent.
Asbestos	Should suspected bulk asbestos be observed during the earthworks, the above process shall be completed by a SQEP, trained to be able to identify and sample asbestos in soil in a safe manner. In the event that asbestos is proven to be present then this will be managed in accordance with procedures set out in Attachment C.
Gas/vapour and/or hot works	The presence of landfill gas was not established in the DSI. Should gas/vapour or hot works be identified as unexpected discovery, procedures to address these risks are provided in Attachment D.
Decontamination of tools and machinery (for unexpected discovery)	A SQEP may require that hand tools and machinery used during 'unexpected contamination' earthworks be decontaminated prior to leaving the site or exclusion zone. Wash water from decontamination of tools and machinery will be captured and disposed to a facility equipped to take the contaminated water. Decontamination of tools and machinery from asbestos control areas in accordance with Attachment B.

6 Health and safety controls

Table 7 sets out the general health and safety measures required for the Project.

Table 7 Health and Safety

Item	Requirement
Health and Safety Plan	As required by the *Health and Safety at Work Act 2015*, a comprehensive Health and Safety Plan (HSP) addressing all site risks will be developed by the Principal Contractor prior to commencement of works, and all sub-contractors will review this prior to commencing works at the site. All personnel at the site must be inducted to the health and safety requirements (including hazards) at the site, and each person is then required to confirm that they have understood these requirements. The HSP and inductions should discuss actions that need to be taken for handling potentially contaminated materials as described in this CLMP. Access to the CWAs shall be restricted using security fencing, with access to contaminated areas within the site further restricted to authorised personnel. Personnel shall be authorised following completion of appropriate site induction procedures and following donning of required personal protective equipment (PPE).
Site control information required	The HSP will define the site ingress and egress arrangements, haulage routes within the site, the location of any uncontaminated areas and location of site support/rest/decontamination facilities.
Personal Protective Equipment (PPE)	During site induction, potential hazards associated with exposure to contaminants will be communicated to all site workers (as described in Section 2) and the following PPE made available for use by site workers, as required: Chemical-resistant gloves; Eye protection, as required; and Full length clothing. Should unexpected contamination or asbestos be present additional PPE requirements may be required as directed by a SQEP or as outlined in Attachment C. On-site decontamination (hand wash) facilities and first aid points will be provided by the Contractor. Workers will be advised to wash hands frequently, particularly when leaving site or consuming food.

7 Testing and disposal requirements at shaft locations

Table 8 presents testing and disposal requirements applicable for the Project for any areas associated with construction. These are subject to change and require updating dependent on final resource consent conditions, detailed design and any additional data available for areas not investigated during Concept Design.

Table 8 Testing and disposal requirements at shaft locations

Location/ Material	SH01	SH02	SH03	SH04	SH05	SH06	SH07	SH08	SH09	SH10	SH11	SH12/SH12A	SH13	SH14	SH15
Spoil <2m * (refer note 1, 2 below)	Offsite disposal to suitably licenced Class 3 licenced landfill facility. Confirmation with landfill facility will be required.	Offsite disposal to suitably licenced Class 3 landfill facility.	Suitable for offsite disposal as cleanfill.	Offsite disposal to suitably licenced Class 3 landfill facility.	Offsite disposal to suitably licenced Class 3 landfill facility.	Offsite disposal to suitably licenced Class 3 landfill facility.	Suitable for offsite disposal as cleanfill.	Offsite disposal to suitably licenced Class 3 licenced landfill facility. Confirmation with landfill facility will be required.	Offsite disposal to suitably licenced Class 3 landfill facility.	Offsite disposal to suitably licenced Class 3 landfill facility.	Offsite disposal to suitably licenced Class 3 landfill facility.	Offsite disposal to suitably licenced Class 3 licenced landfill facility. Confirmation with landfill facility will be required.	Offsite disposal to suitably licenced Class 1 or 2 licenced landfill based on Toxicity Concentration Leaching Potential (TCLP).	Offsite disposal to suitably licenced Class 3 licenced landfill facility.	Offsite disposal to suitably licenced Class 3 licenced landfill facility
Spoil >2m (refer note 1 below)	Suitable for offsite disposal to a cleanfill facility. Confirmation with landfill facility will be required.	Suitable for offsite disposal to a cleanfill facility.	Suitable for offsite disposal to a cleanfill facility.	Suitable for offsite disposal to a cleanfill facility.	Suitable for offsite disposal to a cleanfill facility.	Suitable for offsite disposal to a cleanfill facility.	Suitable for offsite disposal to a cleanfill facility.	Suitable for offsite disposal to a cleanfill facility. Confirmation with landfill facility will be required.	Suitable for offsite disposal to a cleanfill facility.	Suitable for offsite disposal to a cleanfill facility.	Suitable for offsite disposal to a cleanfill facility.	Offsite disposal to suitably licenced Class 3 licenced landfill facility. Confirmation with landfill facility will be required.	Suitable for offsite disposal to a cleanfill facility.	Suitable for offsite disposal to a cleanfill facility.	Suitable for offsite disposal to a cleanfill facility.
Supporting evidence:	City Rail Link PSI report (refer Aurecon DSI report).	Refer *Attachment F* for DSI laboratory tables and analytical reports.						Central Interceptor desk study and ground contamination assessment report (refer Aurecon DSI report).	Refer *Attachment F* for DSI laboratory tables and analytical reports.						
Unexpected discovery sampling	Applies to all shaft locations, if encountered during earthworks.														
Groundwater testing/disposal	Pending confirmation.	Pending confirmation.	Groundwater is not impacted by concentrations of contaminants that require additional management.					Pending confirmation.	Groundwater is not impacted by concentrations of contaminants that require additional management.			Pending confirmation.	Groundwater is not impacted by concentrations of contaminants that require additional management.		
Stormwater testing	Pending confirmation.	Pending confirmation.	Not required, if stormwater controls in place in accordance with ESCP while managing spoil removal < 2m.					Pending confirmation.	Not required, if stormwater controls in accordance with ESCP in place while managing spoil removal < 2m.			Pending confirmation.	Not required, if stormwater controls in place in accordance with ESCP while managing spoil removal <2m..		

Location/ Material	SH01	SH02	SH03	SH04	SH05	SH06	SH07	SH08	SH09	SH10	SH11	SH12/SH12A	SH13	SH14	SH15
Imported fill material	For any imported fill material, if required, the following applies: ■ Soil imported directly from quarries (virgin excavated natural material) does not require testing. ■ Any imported fill material acquired from an alternative source should be assessed by a SQEP to determine its appropriateness for use on the site and to identify any potential discharge consent requirements. ■ Where no analytical data exists, the SQEP is likely to require sampling and testing at a minimum rate of one sample for every 500 m^3 with not less than three samples tested per source, testing shall as a minimum include: – Heavy metals (As, Cd, Cr, Cu, Mg, Ni, Pb, Zn); – Asbestos presence/ absence; and – Total petroleum hydrocarbons (TPH). ■ Testing on materials with a major component (i.e. 50% or more by mass) with a particle size greater than 2 mm may differ from that prescribed above, and will be determined by the SQEP. Analysis of samples shall be undertaken at an International Accreditation New Zealand (IANZ) accredited laboratory.														
Additional Notes	It should be noted that disposal suitability is based on findings of DSI findings. The Principal Contractor should confirm with the appropriate landfill facility regarding acceptance of material, including any additional testing requirements for that particular facility. Refer to Attachment E for landfill classification and types of material suitable for disposal.														

8 Works completion report

On completion of the work, a works completion report (WCR) will be required as part of the resource consent for the Project. The WCR shall be completed by a SQEP in general accordance with the requirements of CLMG No.1[8].

A copy of the WCR will need to be provided to the relevant authorities to comply with any associated resource consent conditions.

Table 9 sets out the minimum requirements.

Table 9 Works completion reporting

Item	Requirement
Works completion report/Site Validation Report	As a minimum the following is required: ■ Confirmation that all works were undertaken in accordance with the CLMP and any applicable consent conditions. ■ Details of any unexpected contamination discovered at the site, a summary of actions undertaken to manage it, and a plan showing the location of the material. ■ Any testing undertaken during the works for disposal purposes. ■ Proof of disposal of any material to a facility authorised to receive the material by way of waste manifests and / or weigh bridge receipts and ■ The timing of the works. A Site Validation Report (SVR) may be required if 'unexpected contamination' is encountered during the earthworks and this will be included in the Works Completion Report. The SVR must be completed by a SQEP. In addition to the Works Completion Report, the SVR will also contain: ■ A summary of the remediation action undertaken at the site; ■ Validation that the objectives of the Remedial Action Plan have been achieved and that the site is suitable for its proposed use; and ■ Details of any required ongoing management and/or monitoring.

[8] Ministry for the Environment, 2021, *Contaminated Land Management Guidelines No. 1*: Reporting on Contaminated Sites in New Zealand, ME 1071, Revised.