

Before the Board of Inquiry
Waterview Connection Project

in the matter of: the Resource Management Act 1991

and

in the matter of: a Board of Inquiry appointed under s 149J of the Resource Management Act 1991 to decide notices of requirement and resource consent applications by the NZ Transport Agency for the Waterview Connection Project

Rebuttal evidence of **Hugh Leersnyder (Construction Environmental Management Plan)** on behalf of the **NZ Transport Agency**

Dated: 3 February 2011

Hearing start date: 7 February 2011

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REBUTTAL EVIDENCE OF HUGH LEERSNYDER ON BEHALF OF THE NZ TRANSPORT AGENCY

INTRODUCTION

- 1 My name is Hugh Leersnyder. I am an Associate in Environmental Science with Beca Infrastructure Ltd.
- 2 I refer the Board of Inquiry to the statement of my qualifications and experience in my statement of evidence in chief (*EIC*) (dated 9 November 2010).
- 3 I repeat the confirmation in that statement that I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court.

PURPOSE OF EVIDENCE

- 4 The purpose of this rebuttal evidence is to respond to certain aspects of the evidence lodged by submitters. Specifically, my rebuttal evidence will respond to the evidence of:
 - 4.1 Mr Paul Conder, on behalf of Unitec (Submitter No. 160-1);
 - 4.2 Mr Poul Israelson, on behalf of Unitec (Submitter No. 160-2);
 - 4.3 Ms Shona Myers, on behalf of Living Communities (Auckland) Inc and Friends of Oakley Creek (Submitter Nos. 167, 179-2).
- 5 In addition, I will comment on relevant aspects of the section 42A Report prepared by Environmental Management Services (*EMS*) dated 7 December 2010 (*Section 42A Report*) and the Addendum Section 42A Report dated 20 December 2010 (*Addendum Report*).

DISPUTE RESOLUTION PROCESS WITHIN THE CEMP

Complaints Procedure

- 6 The evidence of Mr Conder proposes the inclusion in the Construction Environmental Management Plan (*CEMP*) of a process for dispute resolution in the event that disagreements arise regarding appropriate mitigation measures in relation to construction effects.¹ This is supported in the evidence of Mr Israelson, who seeks the amendment of Public Information condition PI.4 to include in the CEMP a disputes resolution process, including mediation options.²

¹ Evidence of Paul Conder, paragraphs 3.8 and 10.3 and Attachment 3.

² Statement of Evidence of Poul Israelson, paragraph 3.4.

- 7 I note that the CEMP contains a process for complaints management.³ Section 3.6.3 of the CEMP states that all complaints will be managed, investigated and resolved (where appropriate) in accordance with the NZTA's *Guideline for Handling Environmental Complaints*. This Guideline specifies that handling all environmental complaints professionally is important including:⁴
- 7.1 Treating complaints on an individual basis due to their fact-specific nature;
 - 7.2 Investigating complaints promptly and thoroughly; and
 - 7.3 Investigating matters on the basis of being a "good corporate citizen".
- 8 Table 3 in Section 3.6.3 of the CEMP states that mediation procedures will be instigated where a complaint is unable to be resolved.⁵ (A copy of Table 3.3 is attached as **Annexure A** to my rebuttal evidence.) Accordingly, a dispute resolution process is already provided for within the CEMP.
- 9 More specifically in relation to Unitec, I understand that there has been further consultation since its evidence was lodged and that the NZTA and Unitec have agreed that various of Unitec's issues (including this one) will now be addressed in a separate side agreement. I understand that Unitec no longer seeks a condition on this matter.
- Dispute Resolution – Auckland Council and NZTA**
- 10 The NZTA's proposed condition (CEMP.13) requires that any "material change proposed to the CEMP" shall be submitted for the approval of Auckland Council at least 10 working days prior to the changes taking effect.
- 11 The condition notes that changes to personnel and contact schedules do not constitute a material change; however any changes to the construction methodology or complaints procedure would do so.
- 12 I consider it would be useful to include in the conditions a dispute resolution process, in the event that there was any dispute or disagreement between the NZTA and the Council when such approval is sought under CEMP.13, or where a dispute arises in

³ CEMP, section 3.6.3.

⁴ Guideline for Handling Environmental Complaints (Environmental Policy Manual: SP/M/023; 2004, updated in 2005.

⁵ CEMP Table 3.3 Management of environmental complaints, Implementation Strategy/ Mitigation Measures.

respect of other Auckland Council approvals required by the Project conditions (for example, to avoid any unreasonable delay).

- 13 The following new condition CEMP.14, is proposed to address that issue:⁶
- CEMP.14 In the event of any dispute or disagreement arising as to any Auckland Council Manager approvals required by these conditions, matters shall be referred in the first instance to the NZTA Regional Manager and to the Resource Consents Manager, Auckland Council to determine a process for resolution.
- 14 I understand that in Ms Amelia Linzey's rebuttal evidence she proposes an equivalent dispute resolution condition to be included within the General Designation conditions.
- 15 While in my experience, any such disputes would ordinarily be dealt with in this manner, the inclusion of this new condition would make this clear.

OAKLEY CREEK MONITORING

- 16 The evidence of Ms Shona Myers⁷ refers to the need for monitoring of water levels, flows, velocity and turbidity in Oakley Creek and seeks that the results be peer reviewed and shared with the Friends of Oakley Creek. I understand that these issues were discussed in the freshwater ecology expert caucusing and the experts agreed to amend proposed Groundwater condition G.12 and Freshwater condition F.5.⁸
- 17 A comprehensive flow and water, and sediment quality baseline monitoring programme is currently in place to record the existing hydrology and stream water quality. A map showing the locations of these sites is attached to this evidence as **Annexure B**.
- 18 Seven flow recording stations are currently operating within the reach of Oakley Creek potentially affected by the Project.⁹ Six of these sites have been specifically established by the NZTA within the past two years to establish a pre-construction baseline for flow. A measure of flow is derived by directly measuring the water level, or stage height, over a weir structure within the stream channel of known cross sectional area. A number of velocity measurements

⁶ This condition is based on condition 2 of Discharge Permit 34254 granted by Auckland Regional Council on 12 June 2006 for the Victoria Park Tunnel project.

⁷ Paragraph 5.29 of Evidence of Shona Myers.

⁸ Expert Caucusing Joint Report to the Board of Inquiry – Freshwater Ecology, 27 January 2011.

⁹ These are also shown in **Annexure B**.

are made over a period of time for a range of water levels. These measurements are subsequently used to develop a rating curve. The rating curve is the empirically derived formula used to calculate flows from the measured water levels.

- 19 In addition to the flow monitoring regime, an extensive baseline water quality monitoring programme is in place. This programme is based on monthly samples collected from five sites. These are also shown on the map attached to this evidence as **Annexure B**. An extensive suite of parameters is currently measured, including pH, turbidity, suspended solids, dissolved oxygen, nutrients and metals. The detail of the water quality assessment is described in the Memorandum attached as **Annexure C** to my rebuttal evidence.¹⁰
- 20 The baseline monitoring programme is complemented by a rainfall triggered "event based" regime prior to construction aimed at collecting eight events from each of two sites. A similar suite of parameters is analysed with the addition of hydrocarbons.¹¹ This information will allow the calculation of event mean concentrations and contaminant loads from the catchment.
- 21 In addition and where possible, sediment samples from the stream bed have been collected twice yearly in January and June. These are analysed for organic matter, metals and hydrocarbons.
- 22 It is envisaged that the existing regime of water quality monitoring will continue from the pre-construction phase through the construction and into the post-construction phase.
- 23 I acknowledge that it is not explicit in the CEMP and the NZTA's proposed conditions that the water quality monitoring will be ongoing beyond completion of construction. To address this issue, I propose amendments to the proposed Freshwater conditions F.1(a) and (b), F.2 and F.3(d),(e) and (f).¹²
- 24 The changes to F.1(a) and (b) and F.2 seek to differentiate the need for monitoring of both freshwater ecology and freshwater quality. The proposed changes to F.3(d) to (f) specify the method and frequency of water and sediment sample collection and analysis.
- 25 The results of the monitoring of Oakley Creek are currently based on sampling and measurement methodologies which are standard and are under the appropriate quality control / quality assurance

¹⁰ This Memorandum dated 11 November 2009 was prepared by Rebecca Bibby, Environmental Scientist, Beca.

¹¹ Hydrocarbons are not analysed in the baseline water quality samples as the initial 3 months of sampling showed levels to be below detection limits.

¹² Mr Eddie Sides (NZTA's freshwater ecologist) has advised me that he supports these proposed amendments to Freshwater conditions F.1, F.2, and F.3.

requirements.¹³ I propose a note at the end of condition F.3 to confirm that future sampling and analysis of water and sediment quality should be carried out by similarly accredited laboratories.

- 26 The amended conditions are attached as **Annexure D**. I understand that additional amendments to Freshwater conditions F.3(a) and (b) were agreed at expert freshwater caucusing to address Ms Myers' concerns.¹⁴ For ease of reference, those amendments are incorporated in Annexure D (all amendments are shown in bold text).
- 27 The monitoring results of freshwater flows, water and sediment quality and ecology within Oakley Creek will be reported to the Auckland Council and, as such, would be publicly available.¹⁵
- 28 It is also envisaged that the Community Liaison Group (CLG) will play an important role in imparting the results of Oakley Creek monitoring to relevant community and environmental groups.¹⁶ I would expect that the Friends of Oakley Creek would be represented on the CLG, and so that this group would be able to review and comment on the monitoring results.
- 29 To clarify this in the conditions, I suggest that proposed Public Information condition PI.6 be amended to add "publicly available environmental monitoring results" to the list of items that shall be provided to the CLG for comment.¹⁷
- 30 In response to Ms Myers' request for a peer review of monitoring results, the results and any interpretive reporting will be subject to compliance checks and review by the Auckland Council. I consider this to be appropriate and sufficient, and do not consider that a peer review would be necessary.

COMMENTS ON SECTION 42A REPORTS

CEMP Management Plan suite

- 31 Section 10.8.66 of the Section 42A Report correctly notes that the Temporary Construction Lighting Management Plan is not listed as a Management Plan in the CEMP, and a draft plan is not included in the Technical Report G.10, Assessment of Lighting Effects.

¹³ Currently the sampling and analysis are carried out by IANZ (International Accreditation New Zealand) accredited and audited laboratories (Beca Infrastructure Ltd and RJ Hill Laboratories Ltd).

¹⁴ Expert Caucusing Joint Report to the Board of Inquiry – Freshwater Ecology, 27 January 2011.

¹⁵ See proposed Freshwater condition F.6.

¹⁶ See proposed Public Information condition PI.5 and PI.6.

¹⁷ See amendments to Public Information condition PI.6 appended to Amelia Linzey's rebuttal evidence.

32 As I explained in my EIC, a suite of Management Plans has been developed in a draft form, listed as appendices to the CEMP.¹⁸ I note that the Temporary Construction Lighting Management Plan (required by proposed Lighting condition L.2) and the Waste Management Plan (required by condition CEMP.11) are both referred to within the body of the CEMP,¹⁹ albeit drafts are not appended to the CEMP. As both plans will be highly dependent on input from the contractor, the detail of these plans has not yet been progressed.

33 However, for the sake of completeness, I agree that these two management plans could be included in the list of management plans presented in condition CEMP.4. Accordingly, an amended condition CEMP.4 is attached as **Annexure E** to my rebuttal evidence.

Monthly Monitoring Report

34 The Section 42A Report suggests²⁰ that “compulsory monthly reporting” to the Auckland Council across all management plans is appropriate. It also seeks a comment from the NZTA on whether a “single integrated Monthly Report” is achievable. The short answer is that neither suggestion is workable, necessary or reasonable, for the reasons set out below.

35 The principal purpose of reporting on the monitoring of environmental effects is to inform the mitigation of these effects. The information provided in reporting should be relevant and at a frequency commensurate with the role and responsibility of the report recipient. As a starting point, the requirement for appropriate reporting is set out in the CEMP and related proposed conditions.²¹ This reporting requirement is also subject to the review processes described in the proposed CEMP conditions.²²

36 The scale of the Project is large and complex. This is true in terms of the spatial and temporal dimensions of the Project, and also in terms of the actual and potential effects of the construction on various elements of the environment. Monitoring and reporting of the effects spans a range of technical disciplines; for example, groundwater levels, archaeology, ecology, air and water quality, traffic and noise (as reflected in the proposed conditions).

37 In some cases, the monitoring may be continuous and the management response to effects on the environment will necessarily be rapid; for example, the continuous monitoring of pH and turbidity

¹⁸ My EIC at paragraph 31. See CEMP, section 1.3.2.

¹⁹ See Sections 3.4.10.3 and 3.4.11.1 of the CEMP.

²⁰ Refer to Section 14.2.13 of the Section 42A Report.

²¹ See Section 4.2 and Appendix P of the CEMP and proposed condition CEMP.2(g).

²² See proposed conditions CEMP.1 and CEMP.13.

in groundwater discharged from the tunnel construction.²³ In other cases, the monitoring may be spread over several months, for example, the proposed 6 monthly monitoring of marine invertebrate community composition, with annual reports provided to Auckland Council.²⁴

- 38 By way of further example of the varying reporting frequencies, the results of continuous monitoring of baseflows in Oakley Creek are proposed to be reported 3 monthly,²⁵ while the reports for freshwater and marine ecological reports are proposed to be submitted annually.²⁶ In many cases the schedule of monitoring proposed is less frequently than monthly. These different reporting frequencies are appropriate for the different technical areas involved and have been recommended by the relevant experts.
- 39 I also do not consider it to be practicable nor efficient from the perspective of the various report writers, nor Auckland Council, for the NZTA to produce a "single integrated monthly report".
- 40 Nor do I consider it necessary, appropriate or workable for there to be a blanket requirement that there be compulsory monthly reporting to Council across all management plans, as suggested by EMS. There will be at least 15 management plans operating during the construction phase.
- 41 I consider it would be more appropriate for the detail and frequency of reporting across the management plans to be agreed between the NZTA and the Auckland Council as a component of the CEMP review process and in consideration of the required Environmental Risk Register.²⁷ In this way, the reporting frequency will be based on an assessment of the risk, that is, the likelihood and consequence of an environmental effect.
- 42 The following amendment to condition CEMP.2(g) could address that (inserted text shown as underline):

CEMP.2 The CEMP shall include, but not be limited to, details of:

- (a) Staff and contractors' responsibilities;
- (b) Training requirements for employees, sub-contractors and visitors;
- (c) Environmental incident and emergency management;

²³ Erosion and Sediment Control Plan, section 5.3, paragraph 2 and proposed Earthworks condition E.9.

²⁴ Ecological Management Plan, Appendix A and Proposed Conditions M.3 and M.8.

²⁵ Proposed Groundwater condition G.12.

²⁶ Proposed Freshwater condition F.6 and Proposed Marine Ecology condition M.8.

²⁷ Appendix A to the CEMP.

- (d) Communication and interface procedures;
 - (e) Environmental complaints management;
 - (f) Compliance monitoring;
 - (g) Reporting (including detail on the frequency of reporting to the Auckland Council);
 - (h) Environmental auditing;
 - (i) Corrective Action.
- 43 This amended condition is also set out in **Annexure E** to my rebuttal evidence.

Management Plans – Performance Standards

- 44 The EMS Section 42A Reports²⁸ comment on the issue of “certification” of management plans by Auckland Council and the authors’ view that all of the proposed Management Plans and/or associated conditions need to include appropriate objectives and measurable performance standards. The Reports acknowledge that many of the NZTA’s draft management plans do include objectives and performance measures and that it is difficult to prepare final management plans until consents are granted and contractors are appointed.
- 45 However, the authors consider a mechanism is required to “lock in” relevant and appropriate objectives and performance standards for each Management Plan so that those aspects of the Plans dealing with the management of key effects cannot be altered by the NZTA and Council without recourse to further public scrutiny and comment.
- 46 In the absence of specific examples being cited in the Section 42A Reports, it is not clear which conditions or management plans are considered to be lacking “relevant and appropriate objectives and performance standards”. Noise effects and the development of appropriate acoustic mitigation are cited as an example of where conditions should not be changed from those imposed by the Board of Inquiry.²⁹
- 47 The CEMP³⁰ provides an overview of operating procedures to be implemented during the construction phase including operating controls and mitigation measures. Specific objectives, mostly drawn from NZTA’s Environmental Plan³¹ are included for the range of potential effects, for example noise, vibration, air quality, water resources, ecological resources and archaeology.

²⁸ Paragraphs 14.2.7 to 14.2.9 of the Section 42A Report and Sections 3.9.3 and 4.2.8 of the Addendum Report.

²⁹ See 4.2.8 of the Addendum Report.

³⁰ CEMP Section 3.4.

³¹ NZTA Environmental Plan 2008.

- 48 The Management Plans appended to the CEMP and associated conditions have been developed to provide procedures that will result in the specified objectives being met. Each Management Plan includes a section setting out Environmental Performance Standards or refers to specific legislative requirements. The detail of the Management Plans in conjunction with, and revised in light of the final designation and consent conditions, define the boundary of acceptable effects for the Project. This concept of an “edge effects approach” is discussed in more detail by Mr Foster in his rebuttal evidence.
- 49 The degree to which the performance standards can be quantified varies between effects. For example, in the case of potential effects from construction noise, the objectives include determining reasonable noise requirements and managing construction noise to acceptable levels. The New Zealand Standard for construction noise³² is used to provide appropriate criteria, which are also specified in the proposed conditions.³³ Levels of noise will be measured using the approved methodology and checked against the criteria. Furthermore, sector specific noise management and mitigation measures have been identified.³⁴ I understand that the detail of proposed construction noise conditions has been agreed in the Section 42A Report on noise and in subsequent expert caucusing.³⁵
- 50 In the case of potential effects on archaeological values, the objectives include proactively limiting the disturbance of significant cultural and heritage features along state highways.³⁶ The performance standards are less quantifiable, making reference to minimising effects on archaeological sites and referring to legislation and planning documents that schedule archaeological values.³⁷ To meet the objective, there is a necessary reliance on the professional integrity of a suitable qualified archaeologist and the obligatory compliance monitoring to be undertaken by the Council and the Historic Places Trust.
- 51 In a third example, the objectives with respect to water resource management include ensuring stormwater treatment devices in the network are effective.³⁸ This objective is met through specifying the implementation of treatment devices that are designed with

³² NZS 6803: 1999 “*Acoustics Construction Noise*”.

³³ See CEMP Section 3.4.1, CNVMP Section 2 and proposed condition CNV.2.

³⁴ See CNVMP Section 12. Sector-specific Noise and Vibration Management and Mitigation Measures.

³⁵ See paragraphs 111 and 112 in the rebuttal evidence of Siiri Wilkenning.

³⁶ See the CEMP, Section 3.4.9

³⁷ See the Archaeological Site Management Plan, Section 2.

³⁸ See the CEMP, Section 3.4.4.

dimensions at least in accordance with an accepted design manual, (in this case the Stormwater Management Devices: Design Guidelines Manual, ARC Technical Publication No. 10).³⁹ The proposed conditions further specify post construction "as built" checks and ongoing maintenance.⁴⁰

- 52 In summary, all three examples described above include appropriate measurable objectives and performance standards which, in conjunction with the proposed suite of conditions, can be "locked in" through the certification of the final CEMP (pursuant to condition CEMP.1), the Management Plans and the confirmed conditions of consent.
- 53 Following my review of the draft management plans and proposed conditions, I consider that they contain appropriate and measurable performance standards. Other than the amendments to the proposed conditions appended to the rebuttal evidence of Ms Amelia Linzey, I do not consider that further amendments are necessary. Ms Linzey also addresses in her rebuttal evidence the issues raised in the Section 42A Report concerning "approval" or "certification" of management plans and Auckland Council's role.
- 54 In the event that the Board of Inquiry considers that the management of an effect requires a different performance standard, proposed condition CEMP.1 provides the mechanism to update the CEMP in line with further conditions imposed by the Board.



Hugh Leersnyder
February 2011

³⁹ See TSMP Section 3 and proposed condition SW.1.

⁴⁰ See proposed Stormwater conditions SW.6 and SW.7.

ANNEXURE A: CEMP TABLE 3.3 FROM THE CEMP: MANAGEMENT OF ENVIRONMENTAL COMPLAINTS

Environmental Complaints Management Plan	
Performance Objective:	To ensure that a rapid and appropriate response is made to the public and internal complaints.
Statutory and Legislative Requirements:	<ul style="list-style-type: none"> • The NZTA Guideline for Handling Environmental Complaints • Resource consent and designation conditions
Performance Criteria:	<ul style="list-style-type: none"> • All complaints to be formally registered • All complaints responded to expeditiously and followed up by a thorough investigation by the site responsible person.
Responsible Person:	<ul style="list-style-type: none"> • Each site specific Project site will maintain an Environmental Manager and Site Manager role. • The Environmental Manager – or in the Environmental Manager’s absence the Site Manager – is responsible for receiving, documenting, and thoroughly investigations all complaints. • All members of staff on site are responsible for their actions which may result in environmental complaints.
Implementation Strategy / Mitigation Measures:	<ul style="list-style-type: none"> • The details of all complaints received (by phone, email, in writing or in person) will be registered on the Environmental Complaint Form. • Upon receiving a complaint the Environmental Manager (or in the absence of the Environmental Manager the Site Manager) will commence an inquiry within 24 hours of receiving the complaints. An interim response advising that investigations are continuing is acceptable. A formal written response to the complainant within 10 days of complaint receipt will be provided to the complainant and appropriate regulatory authorities ([Auckland Council], HPT and/or DoC). • Mediation procedures will be instigated where the complaint is unable to be resolved. • The Environmental Manager will ensure that the details of the investigations and any follow up actions are completed and recorded within the Environmental Complaints Form in respect to each complaint. • All details included on the Environmental Complaint Form will be inputted into the Environmental Complaints Register. • In the absence of the both the Environmental Manager and the Site Manager, the person registering the complaint is to take and document full details of the complaint in accordance with the Environmental Complaint Form and notify the Environmental Manager or Site Manager immediately.
Monitoring:	<ul style="list-style-type: none"> • Targeted monitoring will be completed dependent on the nature of the complaint. • Mechanisms will be established prior to and during construction to provide base lines in relation to noise, dust, water quality and quantity (surface and groundwater), ecological parameters, sediment contamination of the inlet, coastal processes, archaeology surveys through arrangements with local

Environmental Complaints Management Plan	
	Environmental Consultants conducting relevant monitoring and/or sampling.
Reporting	<ul style="list-style-type: none"> • The Environmental Manager will report all complaints to the Site Manager. • The NZTA representative will complete a Construction Compliance Report (including the means by which the complaint was addressed, whether resolution was reached and how the response was carried out in relation to the NZTA Guideline for Handling Complaints). This Report will be completed on a quarterly basis and communicated throughout the NZTA and the required statutory bodies. • The Environmental Manager will summarise all complaints received throughout the sites to on-site staff members during weekly Tool Box sessions.
Identification of Failure to Comply with Procedure:	<p>The following constitute examples of incidents or failure to comply in relation to the management of environmental complaints:</p> <ul style="list-style-type: none"> • Insufficient information recorded on the Environmental Complaints Form; • Failure to submit the Environmental Complaints Form as soon as practical following the receipt of the complaint; • Complaints not documented or reported, and/or record not maintained; • Failure to implement corrective actions; • Failure to report complaint to the NZTA, the Environmental Manager and site personnel.
Corrective Action:	<ul style="list-style-type: none"> • Following the investigation, a Non-Compliance Report (NCR) is to be issued to any party whose actions or omissions which gave rise to the complaint which have been proved to be outside of the guidelines of this CEMP/ regulatory guidelines or permitted operational processes. • In the event CEMP / regulatory guidelines or permitted operation processes were not breached, the Environmental Manager, Site Manager and the NZTA representative are to investigate how work practices may be modified to lesson perceived or actual environmental impact. • Should an incident of failure to comply occur in relation to the management of environmental complaints one or more of the following corrective actions will be undertaken as appropriate: <ul style="list-style-type: none"> ○ Conduct additional training of staff regarding complaint management and processing; ○ Review procedure in light of shortfall.

ANNEXURE B: OAKLEY CREEK SAMPLE SITE LOCATIONS



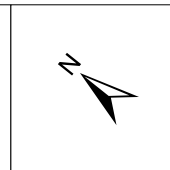
Legend

- Sediment Only Sampling Sites
- ▲ Water and Sediment Monitoring Sites
- ▲ Flow Monitoring

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Scale 1:10,000 at A3

0 100 200 400
Metres



Revision	Author	Verified	Approved	Date
1	CW3	AYF	AH4	20/07/2007
2	MGR	AYF	AH4	25/01/2011

Title:
Oakley Creek Sample Site Locations
Figure 1

Client:
 NZTA

Project: SH16 / SH20 Waterview Connection Project



Discipline:
 GIS

Drawing No.:
 GIS-3814238-27

**ANNEXURE C: OAKLEY CREEK – BASELINE WATER QUALITY
ASSESSMENT**

Memorandum

To: Hugh Leersnyder

Date: 11 November 2009

From: Rebecca Bibby

Our Ref: 3814238/314

Copy:

Subject: Oakley Creek - Baseline Water Quality Assessment

This letter proposes a scope of works for water quality monitoring of Oakley Creek as part of obtaining baseline water quality information prior to development of the Waterview Connection. The water quality data collected as part of this programme will assist in identification and quantification of the environmental impacts on the Oakley Creek from development and long term operation of the Waterview Connection. In this proposal we outline a scope of works for the water and sediment monitoring programme for the 24-month period prior to construction. The programme will be amended and revised after the collection of 24 months baseline data for continuance through the construction phase and operation of the Waterview Connection.

Introduction

The Waterview Connection project will connect State Highway 20 (SH20) at Maioro Street in Mt Roskill to the existing Great North Road interchange on State Highway 16 (SH16) between the suburbs of Waterview and Point Chevalier. The Waterview Connection, once completed, will create an alternative 48km motorway link between Manukau and Albany by linking SH20, SH16 and Upper Harbour Drive (SH18).

The proposed Waterview Connection is approximately 4.5km in length and will pass through or beneath the suburbs of Owairaka, Mt Albert and Waterview. The project will include construction of twin tunnels that, upon completion, will result in approximately 3.4km of the proposed route being 20 – 40 metres underground. The NZTA preferred option includes provision for adjacent two or three lane tunnels for traffic flow in each direction.

The Waterview Connection is to be located in the Oakley Creek Catchment, for which the major watercourse is the approximately 12km long Oakley Creek. The creek passes through a series of open and vegetated reserves, and light industrial, residential and commercial landuse from its headwaters at Molly Green Reserve through to its ultimate discharge into the Waitemata Harbour at Waterview. The Waterview Connection project has potential to impact on the function and aesthetic values of the Oakley Creek through the extraction of water, and the discharge of sediment and/or associated contaminants. However, Oakley Creek is significantly degraded as a result of channel modifications, and the hydrological and water quality effects of urbanisation. The Oakley Creek is a valuable resource to the local communities of Waterview and Mt Roskill, and its protection and enhancement is of great public interest.

1.1 Purpose

This proposal outlines a scope of works for the baseline water and sediment quality monitoring programme to be undertaken for the Oakley Creek through the 24-month period prior to construction of the Waterview Connection. The purpose of the water and sediment quality monitoring programme is to generate a comprehensive database of information from which ultimately the following can be assessed:

Memorandum

- The existing water and sediment quality of Oakley Creek and Meola Creek
- Assessment of the impact of the proposed development on Oakley Creek
- Calculation of changes in contaminant loads as a result of construction and operation of the Waterview Connection
- Provide a basis for evaluating the effectiveness of any resource management, treatment or attenuation measures in terms of the water quality of Oakley Creek

Scope

The proposed scope of services is as follows:

- Undertake a brief literature review and summary of relevant existing water quality information from previous studies carried out on Oakley Creek and Meola Creek.
- Monthly collection and analysis of water quality samples at five sites along the Oakley Creek for a period of 24 months.
- Deployment of two automatic water samplers at two sites along the Oakley Creek with the collection of one composite sample over eight separate storm events at each site.
- The collection of five sediment samples (one from each water quality sampling site) from the bed of the Oakley Creek during both summer and winter within a 24 month period.
- Four six monthly reports will be provided. These will outline the methodologies used in the water and sediment sampling programme as well as present the results obtained in the preceding six months of sampling. No interpretation of the results will be provided.
- A comprehensive report will be provided after 12 months, and updated after 24 months, which contains interpretation of all sediment and water quality data collected during the preceding 12-month period and recommendations given for further monitoring.

Methodology

1.2 Water Quality Monitoring Programme

Water quality sampling will be undertaken once monthly during base flow conditions (following three days of dry weather) for a period of 24 months in order to obtain a comprehensive baseline of water quality information prior to the commencement of the Waterview Connection project. Water samples will be collected from five locations as described below.

In addition to the base flow water quality sampling, the two automatic water samplers, once deployed, will collect a composite water sample from eight separate storm flow events at each of two sites. This information will be used to allow calculation of event mean concentrations and contaminant loads from the catchment.

1.2.1 Sampling Locations

Water and sediment quality sampling will be undertaken at five sites along the Oakley Creek as follows:

- Lower reaches of Oakley Creek, upstream of Great North Road culvert (downstream end of project)
- Cradock Street flow gauge
- Bollard Ave culvert inlet (southern section of future work site)

Memorandum

- Richardson Road culvert (upstream end of project)
- Richardson Road culvert - Stoddard Road tributary (upstream end of project)

Two automatic water samplers with flow modules will be deployed. One water sampler will be installed at the flow monitoring site on Richardson Road, and another in the lower reaches of the Creek adjacent to Great North Road.

1.2.2 Sediment Sampling Programme

Where possible, sediment samples will be collected at each water quality monitoring site (see Section 1.2.1), twice yearly, in both January and July. A composite sediment sample will be collected from each site, by scooping the top 5cm of sediment directly into an appropriate sample container.

1.3 Analysis of Water and Sediment Samples

The analyses undertaken on all water samples collected during base flow water conditions during the first three months of the programme will include the following:

- pH, conductivity, temperature, dissolved oxygen, turbidity, suspended solids, water clarity, nutrients, hardness, cyanide, carbonaceous biochemical oxygen demand, chloride, metals, E coli, total petroleum hydrocarbons, semi-volatile organic compounds, volatile organic compounds and polycyclic aromatic hydrocarbons

It is expected that a number of contaminants in the base flow waters sampled will be either undetectable and/or at levels which are not environmentally significant. As such, analysis of all subsequent base flow water quality samples after the initial three months of the sampling programme, will be significantly reduced and include only those contaminants of importance.

The sediment samples will be analysed for the following:

- Organic matter, metals, polycyclic aromatic hydrocarbons, semi-volatile organic compounds, pesticides and total petroleum hydrocarbons

The pH, conductivity, temperature, dissolved oxygen and turbidity will be measured at each site during field sampling with portable field meters. Envirolab will provide all field meters for this purpose. The flow, where possible, will be estimated at each site during sampling. All remaining analyses will be carried out at R.J Hill Laboratories (Hill Laboratories) in Hamilton. The samples once collected will be placed immediately in chillibins containing ice and despatched to Hill Laboratories the same day as collected.

1.4 Deliverables

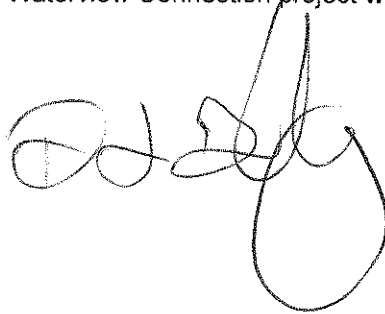
The following deliverables will be provided:

- A brief report will be provided at the end of each six month sampling period that outlines the methods used and presents the results of all laboratory analyses and field data. No interpretation of the results will be presented in this report.
- A further report will be provided after 12 months, and updated after 24 months, from the commencement of the water and sediment monitoring programme. These reports will provide a comprehensive interpretation of the baseline water and sediment quality data of the Oakley Creek prior to construction activities of the Waterview connection.

Additional Notes:

- It is expected that a number of contaminants in the waters sampled will be undetectable and/or at levels which are not environmentally significant. A comprehensive suite of contaminants will be measured during the first three months of base flow water quality sampling after which, it is expected that the suite of contaminants will be reduced significantly for all further sampling events.
- At the end of the 24-month water and sediment sampling programme, the programme will be reviewed and both the frequency of sampling, and the parameters measured will be revised accordingly. In particular, it is likely that the frequency of sampling over the construction and operation phases of the Waterview Connection project will be modified to meet project or consent requirements.

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ANNEXURE D: AMENDED PROPOSED FRESHWATER CONDITIONS⁴¹

F.1.	<p>The NZTA shall finalise, and implement through the CEMP, the Ecological Management Plan (ECOMP) submitted with this application. The ECOMP shall be updated to ensure compliance with the conditions of this consent and include changes to the details of construction processes prior to construction commencing. The ECOMP shall include, but not be limited to details of:</p> <p>(a) Monitoring of the freshwater environment ecology;</p> <p><u>(b) Monitoring of freshwater and stream sediment quality;</u></p> <p>(b)(c) Trigger event criteria for undertaking additional monitoring;</p> <p>(c)(d) Procedures for responding to accidental discharges of contaminants to the freshwater environment.</p>
F.2.	<p>The NZTA shall engage a suitably qualified ecologist <u>and water quality scientist</u> to undertake <u>a</u> freshwater ecological monitoring programme prior to, during and following construction to monitor the effect of the Project on the freshwater ecology. The freshwater monitoring shall be undertaken in Oakley Creek, Pixie Stream and Meola Creek. The freshwater monitoring programme shall be undertaken in accordance with the details set out in the ECOMP and include:</p> <p>(a) Cross sectional profiles;</p> <p>(b) Macroinvertebrates sampling; and</p> <p>(c) Freshwater fish monitoring.</p>

⁴¹ The amendments in blue bold are those made to the November 2010 master set of conditions attached to Ms Linzey's 3rd EIC

F.3.	<p>The freshwater monitoring programme shall, as a minimum, be undertaken in accordance with the following frequency:</p> <p>(a) Prior to construction – two baseline <u>ecological</u> surveys;</p> <p>(b) During construction – <u>twice per year annually</u> for fish, and macroinvertebrates and <u>three times per year for</u> cross sectional profiles, <u>within one month</u> prior to <u>the beginning of the earthworks season during</u> and <u>within one month either side of at</u> the end of the earthworks season;</p> <p>(c) Post construction – on an annual basis for a maximum period of three years, or less if the Auckland Council is satisfied that no adverse effects have occurred or are likely to occur from the Project.</p> <p><u>(d) Monthly water quality samples at the five existing Oakley Creek sample locations to be analysed for turbidity, suspended solids, metals (Zn, Cu and Pb) and nutrients.</u></p> <p><u>(e) Four “event based” samples per annum from each of the current two Oakley Creek sites. The samples are to be analysed for turbidity, suspended solids, metals (Zn, Cu and Pb), hydrocarbons (TPH) and nutrients.</u></p> <p><u>(f) Two sediment quality samples per annum (January and July) at the five existing water quality Oakley Creek sites (if there is sufficient sediment to sample). The samples are to be analysed for metals (Zn, Cu and Pb), polycyclic aromatic hydrocarbons (PAH), hydrocarbons (TPH) and semi-volatile organic compounds.</u></p> <p><i><u>Note: The sample collection and analysis required under sub-clauses (d) to (f) shall be undertaken following an IANZ accredited methodology by a suitably accredited laboratory (International Accreditation New Zealand).</u></i></p>
F.4.	<p>The NZTA shall undertake additional freshwater monitoring in the event of a ‘trigger event’ for freshwater habitats. For the purposes of this consent, a ‘trigger event’ for freshwater habitats is defined in the ECOMP.</p>
F.5.	<p>The NZTA shall review the freshwater monitoring results, provided from Conditions F.2 to F.4, and results in monitoring detailed in earthworks Conditions E.9 and E.19. In the event that potential adverse effects are identified, the NZTA shall develop and implement appropriate contingency plans and/or remedial measures in accordance with the measures set out in the ECOMP.</p>
F.6.	<p>Freshwater monitoring reports shall be compiled from the monitoring undertaken pursuant to Conditions F.2 to F.4, and a report provided to the Auckland Council annually.</p>

**ANNEXURE E: AMENDED PROPOSED CEMP CONDITIONS CEMP.2
AND CEMP.**

- CEMP.2 The CEMP shall include, but not be limited to, details of:
- (a) Staff and contractors' responsibilities;
 - (b) Training requirements for employees, sub-contractors and visitors;
 - (c) Environmental incident and emergency management;
 - (d) Communication and interface procedures;
 - (e) Environmental complaints management;
 - (f) Compliance monitoring;
 - (g) Reporting **(including detail on the frequency of reporting to the Auckland Council);**
 - (h) Environmental auditing;
 - (i) Corrective Action.
- CEMP.4 The management of key environmental effects associated with the construction phase of the Project shall be detailed within environmental management plans that are included in the appendices to the CEMP. This suite of management plans shall be:
- (a) Construction Noise and Vibration Management Plan (CNVMP);
 - (b) Construction Air Quality Management Plan (CAQMP);
 - (c) Erosion and Sediment Control Plan (ESCP);
 - (d) Temporary Stormwater Management Plan (TSMP);
 - (e) Ecological Management Plan (ECOMP);
 - (f) Groundwater Management Plan (GWMP);
 - (g) Settlement Effects Management Plan (SEMP);
 - (h) Contaminated Soils Management Plan (CSMP);
 - (i) Hazardous Substances Management Plan (HSMP);
 - (j) Archaeological Site Management Plan (ASMP);
 - (k) Construction Traffic Management Plan (CTMP);
 - (l) Concrete Batching and Crushing Plant Management Plan (CBCPMP);
 - (m) Electrical Infrastructure Site Development and Construction Management Plan (EISDCMP);
 - (n) **Waste Management Plan; and**
 - (o) **Temporary Construction Lighting Management Plan.**