

Memo

To: Board of Inquiry: NCI **From:** Craig McGarr

Date: 14 July 2017 **Project No:** 17043

Re: Technical Advice: Conditions (Landfill)

Executive Summary

1. The Board has requested a review of the proposed conditions in relation to the Landfill (in association with the Boards legal counsel), and advice as to whether the effects of the works are properly addressed by the conditions.
2. The conditions reviewed are those appended to the JWS: Planning, which were developed from those appended to the JWS: Landfill Issues, through combined conferencing of the planning witnesses with the technical landfill experts for the NZTA and Auckland Council during the joint witness conferencing (Planning).
3. The effects of the works relate to those arising from the encroachment of the proposed busway and shared use pathway, and the related excavation of refuse material and implications to landfill infrastructure.
4. The proposed conditions are sufficient to ensure that the potentially significant effects of the works in the Landfill area associated with the NCI Project are properly addressed. The review of these conditions with the Boards legal counsel has identified that further amendments can be made to make these more robust, and these amendments are appended as **Attachment 1**.

Statement of Position

5. The Landfill is situated east of SH1, and shares a common boundary with SH1. It ceased operation and closed in 2009. On-going after care management and monitoring is undertaken with reference to the discharge consents that are held by Auckland Council (34031, 34032, 34033 and 41939).

6. The actual and potential effects of the works that have been identified by the JWS: Landfill include those related to: odour, landfill gas, hazardous materials, refuse, leachate, perched groundwater, contaminated runoff, land stability, and the health and safety of staff/workers. These effects are proposed to be addressed (mitigated) during and post construction. The JWS: Landfill states that this will occur through:
 - a) Proposed conditions;
 - b) Preparation of the Landfill Management Strategy (LMS);
 - c) Preparation and certification of a Landfill Reinstatement Works Plan (LRWP);
 - d) Preparation and certification of Landfill Construction Method Statements (LCMS);
 - e) Supervision by appropriately qualified personnel; and
 - f) Monitoring (in accordance with the LMS).
7. Items b)-f) above are incorporated within the proposed LW conditions.
8. The JWS: Landfill confirms that the works will not result in any new discharges, post construction of the NCI project, following the re-instatement and/or repositioning of existing Landfill infrastructure post construction.
9. The proposed conditions in relation to the Landfill (specifically) include those referenced as LW.1-LW.12, contained within the set of proposed Resource Consent (RC) conditions. These specific proposed conditions include reference to Contaminated Land conditions (CL.1 – CL.3). In addition to the LW conditions, the proposed conditions include a proposed Groundwater condition (GW.1), which requires any perched groundwater or surface water runoff encountered to be considered as potentially contaminated (and managed through a variety of methods).

Commentary

10. The effects of the current and on-going discharges to land, water, and air from the Landfill are managed through the respective conditions of the consents held by Auckland Council.
11. The approach taken to the proposed conditions is to provide a mechanism (LW.1B) to maintain compliance with the consents held for the on-going discharges to land, water, and air from the Landfill following completion of the NCI Project works (with the current Landfill infrastructure re-instated and/or relocated to achieve that), and/or provide for a process for variations to be obtained to maintain the authorised outcomes should that be necessary during and following completion of the NCI Project works.

12. The proposed conditions require specific measures and processes to be in place through the development of a suite of 'strategies', 'plans', and 'method statements', prior to commencement, and during construction, of the NCI Project (inclusive of the required reinstatement works) to address the effects identified in paragraph 6 above. These are inclusive of a monitoring (and reporting) regime which requires confirmation of compliance with the consents held by Auckland Council. The proposed conditions require these various 'strategies', 'plans', and 'method statements' to be certified, and subsequently undertaken by appropriately qualified personnel.
13. Following completion of the works, the on-going monitoring of the Landfill will revert to Auckland Council as the holder of the respective discharge consents (via the LMS required by LW.1B).
14. In my opinion, the proposed conditions are sufficient to ensure that the potentially significant effects of the works in the Landfill area associated with the NCI Project are properly addressed, but could benefit from amendment and restructure to improve legibility, as set out in **Attachment 1**.

NB: Recommended amendments shown in underline and strike through

General

The purpose of the following LW conditions is to allow for the safe management of the Landfill within the area affected by the NCI Project by the Consent Holder during the construction of the NCI Project and to allow for the design to take into account the effect on the Landfill's ongoing operation post-construction.

LW.1 No works are to occur within the Closed Landfill until such time as all necessary approvals in accordance with the Resource Management Act 1991 have been obtained to authorise removal and/ or relocation of existing control and monitoring assets that may be affected by the construction works.

LW. 1A For the purposes of the landfill conditions, a suitably qualified person (or persons) means a Chartered Professional Engineer with a minimum of 10 years' relevant Landfill experience, who is acceptable to the Auckland Council (Team Leader Northern Monitoring).

Landfill Management Strategy

LW.1B A Landfill Management Strategy ('LMS') shall be prepared by a suitably qualified person(s) in consultation with the Auckland CLCLR team (as the Consent Holder of consents 34031, 34032, 34033 and 41939 for the operation, maintenance and monitoring of the Closed Landfill) for Auckland Council's (Team Leader Northern Monitoring) certification.

The purpose of the LMS is to ensure that the consents listed above continue to be complied with, the environmental outcomes authorised by the consents continue to be achieved, and the operational integrity of the Landfill is secured.

The LMS shall be consistent with the Project Alliance Agreement Appendix A14 Landfill (19 April 2017) referred to in condition RC.1, as may be modified from time to time by agreement between Council and the Consent Holder, in relation to outcomes to be achieved to avoid, remedy or mitigate adverse effects on the environment from changes to the Landfill as a result of the NCI Project.

This condition is offered by the Consent Holder on an Augier basis where it refers to Project Alliance Agreement Appendix A14 Landfill.

LW.1C The LMS must include, as a minimum, measures for the Consent Holder to locate, protect and/or relocate the following landfill infrastructure:

- a. Toe bund/retaining wall;
- b. Side wall and base liner;
- c. Cap/cover;
- d. The landfill gas management system, including any additional requirements for isolation of the extraction system from the Project area, and any potential impact on the operation of the Landfill gas flares(s);
- e. The leachate management system, including the leachate terminal manhole and leachate discharge pipe under the Project area;
- f. The landfill monitoring infrastructure including groundwater, leachate, landfill gas and surface water. If relocation of any landfill monitoring infrastructure is required, a programme shall be developed which allows for decommissioning and replacement of monitoring points including continuity in monitoring data; and
- g. The stormwater management system (including any flow on effects associated with any increase in inundation and infiltration), including Stormwater Pond 7 and the associated underground box culvert.

LW.1D The LMS shall take into account the need for pre, during and post-construction settlement monitoring of the western landfill slopes and identify the remedial measures that will be undertaken in the event that there is a potential risk to Landfill stability.

LW.1E The LMS shall outline the necessary authorisations needed for the works identified in the LMS required by Condition LW.1B, associated implementation timeframes and responsibilities.

LW. 1F The Consent Holder shall cease work in the Landfill when the following gas trigger values are breached:

[To be provided by expert]

Works shall not recommence until a suitably qualified expert certifies that the levels of gas will not adversely impact on human health and safety.

Landfill Reinstatement Works Plan ('LRWP')

LW.2 A LRWP shall be prepared by a suitably qualified person and submitted as part of the CEMP. The LRWP shall reference, and be consistent with, to the extent relevant, the CSMP prepared in accordance with conditions CL.1 to CL.3.

LW.3 The purpose of the LRWP is to:

- a. Avoid or minimise all adverse effects associated with working in the Landfill; and
- b. Avoid adverse effects on human health and safety offsite.

The LRWP shall include, but is not limited to, the matters listed in condition LW.4.

LW.4 The LRWP shall include the following information in relation to the works to be carried out on the Landfill, including:

- a. The measures to be undertaken to minimise potential odour effects to ensure that there is no noxious, dangerous, offensive or objectionable odour arising from the works beyond the northern, eastern and southern Landfill boundaries;
- b. The dust control measures to be undertaken to avoid or mitigate the potential effects on on-site and off-site receptors;
- c. Asbestos management and removal measures in accordance with the Health and Safety at Work (Asbestos) Regulations;
- d. The measures to avoid or mitigate any leachate and contaminated stormwater generated on site during the works;
- e. The measures to avoid or mitigate the impact of the works on upstream groundwater and leachate levels, and the potential increase in risk of future seeps;
- f. The measures to avoid or mitigate the impact of the works on waste stability;
- g. Measures to be adopted to ensure that retained or removed refuse and contaminated soils are appropriately managed in order to avoid or mitigate adverse environmental and/or health and safety effects. Should it be necessary, this includes the appropriate handling, transport and disposal of refuse and contaminated soils offsite at an appropriate facility;
- h. Use of plant and equipment appropriately rated and protected for use in a Hazardous Atmospheric Zone;
- i. Methods for undertaking continuous landfill gas monitoring required by LW.10 for the duration of the construction works in the vicinity of the Landfill and access to these monitoring and inspection points for Auckland Council, or their agent;
- j. Landfill gas trigger values for the cessation of works within the works area, the The procedures for the cessation of works when the landfill gas trigger values in LW.1F are breached, and the circumstances in which works may recommence;

- LW.4A The landfill reinstatement construction works shall be undertaken under the direction of a suitably qualified person, taking into account the requirements of the IPENZ Practice Note for Construction Monitoring.
- LW.5 The LRWP shall also include a Landfill Health and Safety Plan ('LHSP') prepared after consultation with the Council CLCLR team for the purpose of avoiding adverse effects on health and safety of construction workers and landfill staff. The LHSP shall contain a description of measures which will:
- a. Avoid any health and safety risks associated with hazardous materials, landfill gas and leachate;
 - b. Provide for training and supervision of construction workers and Landfill staff;
 - c. Emergency contacts and procedures. Emergency Response contacts for the Landfill shall include the details of the Council CLCLR Rosedale Landfill Site Manager.

Landfill Construction Method Statements

- LW.6 Prior to excavation and construction works commencing in the vicinity of the Landfill the Consent Holder shall submit Landfill Construction Method Statements ('LCMS') prepared by a suitably qualified person, and submitted to the Council CLCLR team for certification. The LCMS shall be prepared and submitted after consultation with the Council CLCLR team. Certification shall be obtained from Council prior to the commencement of any works that have the potential to impact upon landfill infrastructure. ~~Certification shall not be unreasonably withheld.~~
- LW.7 The Consent Holder shall reinstate the Landfill once works are complete, including:
- a. The Landfill sidewall, including liner and cap/cover;
 - b. The Landfill infrastructure (leachate, gas, stormwater, access track); and
 - c. The Landfill monitoring infrastructure.
- LW.8 The LCMS shall include information, including but not limited to engineering drawings, specifications and calculations, about how works are to be carried out within the Landfill including:
- a. Temporary works including temporary reconfiguration of leachate, gas and stormwater infrastructure;
 - b. Temporary support of the excavated refuse profile;
 - c. Reinstatement of the Landfill sidewall, including liner and cap/ cover;

- d. Reinstatement of the Landfill infrastructure (leachate, gas, stormwater, access track);
- e. Reinstatement of the Landfill monitoring infrastructure including new gas migration monitoring probes and new groundwater monitoring wells;
- f. Construction of protection measures (such as a gas interception trench) to mitigate Landfill gas effects;
- g. Commissioning of the reinstatement works;
- h. How the works will achieve the factors of safety against instability in the relevant codes and standards;
- i. How the design has considered and incorporated the results and / or other outputs of Project specific landfill site investigations (geotechnical and environmental) in the detailed design.

LW.9 Landfill reinstatement works shall be carried out in accordance with the certified LCMS required under condition LW.6.

Monitoring and Risk Management

LW.10 The Consent Holder shall undertake continuous gas monitoring for the duration of the construction works in the vicinity of the Landfill, ~~ensure that the monitoring programme is implemented~~ in accordance with the LMS strategy, required by condition LW.1B.

LW.11 The results of all monitoring shall be supplied within two working days to the Council CLCLR team.

LW.12 The Consent Holder is to provide for access for Auckland Council, or their agent, during construction, to any equipment required to be inspected, maintained or adjusted for the purposes of managing gas risk on or off-site, and to meet operational requirements.