McGuinness Institute title: [DEV-19-SUB-0305] Landfills vulnerable to the effects of climate change

In Confidence

Office of the Minister for the Environment and

Office of the Associate Minister for the Environment

Chair, Cabinet Economic Development Committee

Landfills vulnerable to the effects of climate change

Proposal

1. This paper seeks to confirm the Government's position with respect to landfills vulnerable to the effects of climate change, in particular more frequent and severe storm events and sea-level rise. It arises from the recent events at Fox River and Hector Landfills both on the West Coast of the South Island.

Executive summary

2. Landfills situated within coastal or river margins or on floodplains are becoming more vulnerable due to the effects of climate change, including sea-level rise and more frequent severe storm events. The recent breaching of the Fox Landfill by a severe storm event that spread waste materials along 21 kilometres of riverbed and 51 kilometres of coastline highlighted this vulnerability and the increased urgency required to address similar vulnerable landfills.
3. A landfill's owner (mostly territorial authorities, but also private landowners) is responsible for the monitoring and maintenance of the landfill and the clean-up of any unconsented discharges to the environment. However, landfills are not the only infrastructure for which territorial authorities are responsible that are at risk from climate change.
4. On 5 December 2018, the Cabinet Economic Development Committee (DEV) agreed to a cross-agency Community Resilience work programme that includes considering approaches to funding and financing natural hazardous risk management, climate change adaptation and cost-sharing principles [DEV-18-MIN-0292].
5. The Department of Internal Affairs (DIA), the Treasury and the Ministry for the Environment (MfE) are progressing the workstream developing principles and approaches to inform decisions on the funding and financing of climate change adaptation. This will encompass the councils' vulnerable infrastructure/assets, including landfills.
6. Reports from the Productivity Commission and Local Government New Zealand (LGNZ) note that the protection of infrastructure – such as roads, wastewater plants, parks and buildings – from the effects of climate change is placing significant pressure on territorial authorities' finances. Territorial authorities will be required to make decisions on prioritising which of their infrastructure/assets to protect.

7. We consider that when a vulnerable landfill is breached by a natural event, it is the landfill owner's responsibility to repair or remediate and clean up any wastes discharged to the environment. The Resource Management Act 1991 (RMA) requires regional councils to control discharges to the environment, including waste material from landfills. We expect regional councils to take steps to ensure that the landfill's owner is undertaking the appropriate mitigation and/or remedial actions required to prevent or address any discharges.
8. However, as demonstrated by the Fox Landfill, some small territorial authorities do not have the available resources required to manage vulnerable landfills impacted by significant natural events. Were these small councils to plan to address their vulnerable landfills, the cost of protection/remediation of their landfills could constitute a significant proportion of their rateable income.
9. Whilst the Community Resilience work programme may address these concerns in the longer term, we consider a method for assisting small territorial authorities to address their most vulnerable landfills may be required in the interim.

Background

10. Several months after the May 2018 Local and Central Government Forum, DEV agreed on 5 December 2018 to a DIA-led cross-agency Community Resilience work programme. The cross-agency group worked with LGNZ to develop resilience and options to reduce risk to lives, assets and costs from significant natural events.
11. The Community Resilience Group work programme has identified the following five distinct workstreams, which focus on how communities can best be supported to manage risks from natural hazards and adapt to climate change through agency coordination and development of policy:
    - information to support better decision making
    - enhanced use of risk assessment
    - enabling better decision-making in the resource management system for natural hazard risk management and adaptation to the effects of climate change
    - insurance markets and risk financing
    - principles and approaches to funding and financing.
12. The Treasury, DIA and MfE are co-leading the workstream that considers principles and approaches to funding and financing of natural hazard risk management and climate change adaptation into the future, and the potential need for cost-sharing principles.
13. This workstream aims to develop a fair and consistent framework for the funding and financing of risk mitigation and adaptive behaviours, both nationally and across regions, underpinned by agreed principles. The framework will address the roles for central government and establish principles for underpinning the roles and responsibilities in funding and financing for community resilience.

West Coast landfills

14. The recent event at the Fox Landfill on the West Coast has made it apparent that the effects of climate change such as more frequent and severe storm events and

sea level rise are compromising the security of landfills situated on, or close to, coastal and river margins or in flood plains.

15. Central government funding is available to help repair and reinstate infrastructure and assets damaged by the natural events as occurred at the Fox Landfill. These funds include New Zealand Transport Authority's (NZTA) National Land Transport Fund and, under some circumstances, local authorities may be eligible to claim costs associated with essential infrastructure recovery repairs from the Ministry for Civil Defence and Emergency Management (MCDEM).

16. There are no dedicated or readily available funds for assisting territorial authorities to proactively address vulnerable landfills or remediate environmental discharges resulting from a containment breach or failure. Therefore, we are asking you to consider the Government's position on assisting small territorial authorities lacking the financial reserves and resources needed to address these vulnerable landfills.

17. The extreme rain event in the Fox River catchment that occurred on 26 and 27 March 2019 washed away a large section of Westland District Council's closed Fox Landfill. The erosion resulted in the discharge of the waste contained within the landfill to 21 kilometres of riverbed and 51 kilometres of the coastline.

18. The Westland District Council placed temporary rock protection to secure the landfill and began the clean-up of the waste materials discharged. The council reported it had spent $600,000 undertaking the remedial and clean-up works. On 29 May 2019, it took the decision that it was financially unable to continue with the river and coastal clean-up works and appealed to central government for assistance.

19. The Government provided the Westland District Council with $300,000 funding to assist with the clean-up of the Fox River. This funding comprised $200,000 from the Department of Conservation (DOC) and $100,000 from MfE's Contaminated Sites Remediation Fund (CSRF). DPMC made a $75,000 contribution to the Westland District Councils Mayoral Relief Fund for welfare costs following the floods. The Westland District Council also received $30,000 for Rural Support Trusts to assist its communities.

20. On 10 June 2019, Cabinet [CAB-19-MIN-0279] noted that the Minister of Conservation would lead the Government's response to the Fox River clean-up. The Minister of Conservation tasked DOC to lead the on-the-ground clean-up on 19 June 2019.

21. On 11 August 2019, DOC with the assistance of the New Zealand Defence Force (NZDF) and volunteers completed the clean-up of the Fox and Cook Rivers and the beaches north and south of the river mouth. The DOC-led clean-up exercise is predicted to have cost $300,000, excluding NZDF marginal costs ($200,000) and has taken over 3,000 days of combined DOC, NZDF and volunteer effort. The equivalent of more than 14,500 household rubbish bags of waste were removed from the riverbed and coastline.

22. Since the Fox event, the Westland District Council and other territorial authorities have expressed concerns about the vulnerability of landfills in their areas. Vulnerable landfills have been a focus of media attention since the Fox event. In early August 2019, the Hector Landfill, north of Westport featured on the national television news, and erosion of Dunedin's Kettle Park Landfill located on Ocean Beach has also been reported in the local media.

23. Landfills at Hector, Hannah's Clearing and Neil's Beach on the West Coast and Ocean Beach in Dunedin are just a few examples of vulnerable landfills that are currently being exposed by the sea and the waste material being discharged to the environment. Regional councils are currently working to determine the scale of this issue, with results due mid-2020.

24. In January 2019, LGNZ published its report titled '*Vulnerable: the quantum of local government infrastructure exposed to sea level rise'* (the LGNZ report). This report identifies that for six regional councils a 0.5-metre increase in sea level would potentially compromise the integrity of 110 closed landfills. In terms of active landfills, of these six regional councils, Canterbury and Otago each have one landfill that may be affected by a 0.5-metre increase in sea level.

Analysis

Landfills and infrastructure under pressure

Responsibility for landfills

25. Regional councils regulate the siting, design and authorisation of the waste types discharged into a landfill under the Resource Management Act 1991 (RMA). The owners of new landfills must submit a thorough assessment of the environmental effects and management controls, such as siting, liners and closure plans as part of their resource consent application. Regional councils have duties under the RMA to control discharges to the environment, including waste from landfills.

26. Through the resource consent application process, regional councils set resource consent conditions that require owners/operators of operating landfills and/or landfills closed post-1991 to monitor and maintain their landfills for up to 35 years, and longer if discharges persist.

27. The Local Government Act 2002 requires territorial authorities to utilise an infrastructure strategy to manage assets effectively. For example, landfill assets such as containment structures, lining, leachate and gas collection systems could be depreciated to allow for replacement and maintenance costs. The infrastructure strategy should include schedules and budgets for the monitoring and maintenance of assets.

28. Landfills closed prior to 1991 are not usually subject to the same controls. Regardless of whether a landfill is consented or not, the prevention of any discharges from landfills, dumps or other contaminated sites is the responsibility of the landowner. In most cases, closed landfill owners will be territorial authorities, but some landfills and the majority of contaminated sites, are likely to be located on private land.

29. Following the Fox Landfill event, the scale of the works required exceeded the Westland District Council's available resources and it took the decision to cease its river and beach clean-up works.

30. The Westland District Council has continued work on the Fox Landfill including designing a more robust protection structure and long-term solutions for vulnerable landfills in the district. The council has informed MfE that it does not have the

financial resources to implement all these actions promptly and are concerned that the landfill's current protection may fail, if works are delayed.

31. The Hector Landfill, Buller District, West Coast, which is understood to have operated from the 1940s and closed in the 1980s, is being eroded by the sea. During storm events, waste and hazardous materials such as asbestos are exposed. The Buller District Council has undertaken temporary measures to protect the landfill, prepared a preliminary site report and commissioned the design of a seawall to protect the landfill from further erosion. However, it has not commenced construction of the seawall due to limited resources.

32. Some territorial authorities have taken steps to address their vulnerable landfills. A report to the Waikato Regional Council's Audit and Risk Committee on 20 August 2019 details two examples of where territorial authorities have taken responsibility for remediating and protecting coastal landfills from coastal erosion. WRC and the territorial authorities worked together to address the following two coastal landfills that were subject to erosion:

    - Kaiaua closed coastal landfill - The Hauraki District Council supported by the Waikato Regional Council remediated the Kaiaua closed landfill. In 2014, this closed landfill was breached during storms and released asbestos related refuse along the Kaiaua shoreline. Remediation work involved simple removal of 3,220 tons of waste material and re-landscaping the area. The cost for the remedial works, excluding disposal fees, was approximately $493,000.
    - Manaia former tip site - The Waikato Regional Council worked with Thames-Coromandel District Council and NZTA in 2018 to remediate the site, and has established an ongoing programme of regularly checking the coast for residual waste that may appear due to shifting sand.

How many landfills are vulnerable?

33. Historically each district or city council had its own landfill or landfills. These landfills were generally sited in readily available void spaces (eg, gravel/sand pits, old river channels and gullies), and little consideration was given to their location or their potential future environmental effects.

34. The number of landfills that closed before 1991 is unknown, however the *1998/99 National Landfill Census report* prepared by MfE noted that "regional councils identified 914 closed landfills in their regions". Whilst not all these landfills will be vulnerable, it is considered likely that most will not be actively monitored.

35. Regional councils, in partnership with MfE, have commenced a pilot project to develop a spatial tool that, using information available to the regional councils and territorial authorities, will identify and rank vulnerable landfills in Canterbury and on the West Coast. Following the development of the tool and validation of its results, the tool will be rolled out to the other regional councils enabling them to complete a similar exercise. Although project scheduling is not yet finalised, we anticipate that nationally consistent information will be available mid- to late 2020.

Wider infrastructure at risk

36. It is not only landfills that will be impacted by rising sea levels or more extreme storm events, other council, business and private infrastructure/assets (eg, three waters,

roads and buildings) are also at risk. The Productivity Commission's draft report *Local government funding and financing* and the LGNZ report identifies other 'at risk' council infrastructure such as roads and wastewater treatment plants.

37. Climate change effects are not limited to coastal margins and other contaminated sites that potentially pose greater risks to health and the environment may also be affected. The Waikato Regional Council's report to its Audit and Risk Committee details:

    "There are currently 16 landfills within 100 metres of the Waikato Region coastline. In comparison, there are:

    - 125 landfill sites within 100 metres of the coastline, rivers or floodplains in the Waikato Region.
    - 1,544 potentially contaminated sites in total within 100 metres of the coastline, rivers or floodplains in the Waikato Region."

38. The quantum of infrastructure/assets that are at risk from the effect of climate change is unknown. In September 2019, consultants appointed by MfE began work on the framework for the development of the first National Climate Change Risk Assessment (NCCRA) required under the Climate Change Response (Zero Carbon) Amendment Bill 2019. The NCCRA will assess the risks to New Zealand's economy, society, environment, and ecology from the current and future effects of climate change using existing information. It will identify the most significant risks to New Zealand at a national level, based on the nature of the risks, their severity, and the need for coordinated steps to respond to those risks.

39. The NCCRA is scheduled to be completed by mid-2020. The findings of the NCCRA will inform the development of the National Adaption Plan. The National Adaption Plan will present the Government's response to the most significant risks identified in the NCCRA; this may not be closed landfills.

40. We recognise the risk that landfills are only one of many vulnerable assets and infrastructure managed by territorial authorities and that the development of a funding solution for vulnerable landfills may signal to territorial authorities that solutions for the protection of other vulnerable infrastructure/assets may also follow.

Funding issues

Funding pressures on territorial authorities

41. The scale of, and speed at which, climate change risks are challenging territorial authorities' infrastructure/assets is not well understood. However, it is apparent that some territorial authorities have limited ability and resources to adapt quickly enough to prevent, manage or mitigate significant adverse events. The LGNZ report identified that other territorial authority infrastructure such as wastewater treatment plants, three waters infrastructure and roads are also vulnerable to the effects of climate change. Territorial authorities are quickly becoming aware of the scale of the climate change issue and each territorial authority will have to make some difficult decisions on prioritising their expenditure on protecting their infrastructure.

42. The decision to protect or remediate landfills in preference to other infrastructure will be a difficult decision. The Buller District Council are currently seeking funding

to build a seawall. The seawall has a design life of 100 years based on current climate change expectation. However, should sea levels rise faster and higher than expected, the design life could be significantly shorter. It is unknown whether the Buller District Council has considered other options such remediating the Hector Landfill. Potentially it could excavate the landfill, place the waste on a train and transport and dispose the waste to Kate Valley Landfill in Christchurch. This may be more expensive than building a seawall in the short term, but would significantly reduce the Buller District Council's future liability.

43. The Westland District Council is looking to remediate the Fox Landfill and up to four other vulnerable landfills in its district. Its proposal is to excavate the waste materials from all the landfills and deposit the waste in one new specially design containment cell located in a secure location. It would be required to apply for resource consents for the containment cell and the excavation and disposal of the waste materials. At a meeting in Hokitika on 9 August 2019, the council informed MfE that undertaking the landfill remediation project could only be completed at the expense of other scheduled urgent infrastructure upgrade/protection projects.

44. The disposal of waste into a landfill or containment cell may attract the Waste and Emissions Trading Scheme (ETS) levies that would significantly increase remediation costs. MfE are currently investigating options for amending the regulations to allow the optional use of unique emissions factors based on analysis of waste composition. Such emissions factors could differentiate decomposed landfill waste from other waste. This could potentially reduce the ETS levy cost component of a remediation project.

45. The Fox and Hector Landfills provide evidence to show that responding to damage to, or reduced structural integrity of, vulnerable landfills is placing significant pressure on the territorial authorities' finances and, in some cases, it exceeds their available resources.

46. The LGNZ report estimates that the total replacement value of all exposed infrastructure (eg, three waters, roads, buildings/facilities, green space and landfills) at the 0.5-metre increment is approximately $2.75 billion. The replacement cost increases incrementally with sea-level rise and at 3 metres, the estimated exposed value is greater than $13 billion.

Current Funding Options - general

47. The owner of a landfill is responsible for its operation, monitoring, maintenance and clean-up resulting from any discharges to the environment. Therefore, it was not considered necessary for central government to provide specific funding to help landowners with events such as occurred at the Fox Landfill, nor to assist them to take proactive steps to mitigate or remove the risk of similar events.

48. Central government funds are available following natural disasters to help with repairs to infrastructure such as bridges, road and potentially landfills.

49. The Westland District Council has informed MfE it is hoping to recuperate from the MCDEM up to 60 per cent of its expenditure for the works to secure and protect the Fox Landfill. However, MCDEM does not cover the costs for environmental clean-up exercises like that required downstream of the Fox Landfill.

Current funding options - MfE

50. MfE has two funds that assist with contaminated land and waste minimisation projects. The Contaminated Sites Remediation Fund's focus is to investigate and remediate priority sites contaminated with hazardous substances/chemicals and pose a risk to health and the environment. The Waste Minimisation Fund (WMF) funds projects that promote or achieve waste minimisation.

51. Neither the CSRF nor the WMF were envisaged, or intended, to address the effects from climate change on contaminated land or waste infrastructure/assets. Projects undertaking infrastructure restoration works or construction of structures to protect assets from the effects of climate changes are therefore not considered eligible for funding.

Contaminated Sites Remediation Fund

52. The CSRF has an annual appropriation of $2.63 million, to assist regional councils to investigate and remediate their priority contaminated sites. These were previously known as orphan sites. The polluter is normally long gone and no one has legal responsibility to fix the problem. In 2019/20, only $2.13 million of funding is available. This reduced appropriation results from funding being pulled forward by the previous Government to 2017/18 from both the 2018/19 and 2019/20 financial years to help fund the remediation of the Calwell Slipway, Nelson and the removal of hazardous chemicals from Concours Electroplaters, Timaru. The CSRF is heavily oversubscribed and makes only modest progress addressing the worst of sites.

53. In June 2019, Westland District Council received $100,000 from the CSRF. This funding was specifically to assist with the remediation and clean-up of the Fox River and was not to be used to protect the Fox Landfill. At the time, the council was approved CSRF funding for the Fox clean-up, MfE noted this funding might create a precedent for territorial authorities requesting financial assistance with their closed landfill. This was an ad-hoc response to an urgent issue.

54. On 9 July 2019, the Mayor of Buller District Council requested $660,000 from central government to assist the council to build a seawall to protect the Hector Landfill that is undergoing coastal erosion. The Buller District Council consider the Crown is partially liable for the protection of the waste material as a large proportion of the waste deposited in the landfill was from Solid Energy's Stockton coal handling yards. The council previously requested funding for the seawall from the CSRF in September 2018/19. The funding application was declined, as there were insufficient funds available and it was considered a climate change adaption project.

55. The CSRF has previously received applications from the Otago, Canterbury, Bay of Plenty and West Coast regional councils requesting assistance with the protection of landfills from coastal erosion. These applications were declined, as they are not considered eligible for funding.

Waste Minimisation Fund

56. The WMF funds projects that increase resource efficiency, reuse, recover and recycle and decrease waste to landfill. The waste disposal levy is the source of revenue for the fund. The levy was introduced under the Waste Minimisation Act 2008 (WMA). The levy is $10 per tonne (excluding GST) on all waste sent to landfill. The available funding is dependent on the amount of waste levy collected. In 2018,

approximately $11 million was available for waste minimisation projects through the WMF. Central and local government share the levy collected on a 50/50 basis. Local government is required to use its share for waste minimisation projects and central government distributes its share of the funding through the WMF.

57. The WMA encourages a reduction in the amount of waste generated and disposed of in New Zealand. The aim is to reduce the environmental harm of waste and provide economic, social and cultural benefits for New Zealand.

58. The current review of the waste levy will potentially increase the amount of funding available for addressing waste related issues/projects. However, application of the WMF to vulnerable landfills would require changes to the WMA. Amending the WMA, which is unlikely to occur before 2020, would also provide other waste and contaminated site projects potential access to the WMF. Local government are likely to agree to expand the use of their funding to include addressing vulnerable landfills.

Future funding options

Productivity Commission Report

59. The Productivity Commission's draft report:

- notes that local government will face new challenges and growing pressure on funding responding to climate change including the threat from sea-level rise and more frequent and extreme storm events
- concludes, the impacts of climate change present a significant pressure on local government funding and financing. Making decisions about where to protect, accommodate or retreat to minimise future risk and how to fund adaptation actions will call for challenging and intensive community processes.
- suggests two new funding mechanisms to support local governments facing major climate damage to their infrastructure:
    - extending the NZTA model to co-funding the costs of adapting land-transport infrastructure
    - the development of a Local Government Resilience Fund to support affected territorial authorities to adapt their water infrastructure and their river and floodplain management to new climate risks and realities.

60. The Productivity Commission recommends formulating a set of principles for funding the costs of adaptation to climate change as a helpful place to start. Its final report will be delivered in November 2019. The Government response, led by DIA, will likely be provided in 2020.

Next Steps

61. Although landfills on land owned by council are the council's responsibility, it is likely that in the majority of cases, these vulnerable landfills are legacy issues. Territorial authorities are being held responsible for decisions on the landfill's siting and controls that were acceptable at that time, but would now not be permitted.

62. Whilst we consider the responsibility for the management of closed landfills is a function of local government, we are asking you to confirm the Government's position on supporting small territorial authorities unable to meet the additional

financial and resource needed to address vulnerable landfills at risks from climate change effects.

63. If Cabinet wishes to look into this matter further, we will instruct MfE to investigate methods to assist small territorial authorities to address their most vulnerable landfills. Our officials will investigate options for funding and develop eligibility and assessment criteria.

Consultation

64. MfE prepared this paper. In addition, Treasury, DOC, the Department of the Prime Minister and Cabinet (National Security Group and the Ministry of Civil Defence and Emergency Management), and DIA were consulted during this paper's preparation, and all comments are reflected in the paper.

Financial implications

65. This paper does not specifically request a recommendation for expenditure. If Cabinet decides that territorial authorities need support to protect or remediate their closed landfills, options including potential funding mechanisms will be developed and brought back to Cabinet for approval.

66. A late Budget bid may be required should:

- Cabinet agree to support territorial authorities with vulnerable landfills
- a new appropriation be determined and agreed to, following further analysis. This could be linked to the Community Resilience bid for Budget 2020, which is being developed under the Transition Theme.

Legislative implications

67. There are no legislative implications arising from this paper's recommendations.

Regulatory impact analysis

68. A regulatory impact statement is not required.

Human rights

69. The proposals in this paper are not in any way inconsistent with the New Zealand Bill of Rights Act 1990 and the Human Rights Act 1993.

Publicity

70. All regional councils have received a Local Government Official Information and Meetings Act request from Radio New Zealand and Stuff reporters asking for all landfills within 100 metres of the coast. The councils are currently considering what information they will release. We therefore consider it likely that there will continue to be further items in the media regarding health and environment harm resulting from discharges from vulnerable landfills.

Proactive Release

71. We intend to release this paper following Cabinet agreement on the Government's position on assisting territorial authorities with vulnerable landfills subject to redactions as appropriate under the Official Information Act 1982.

Recommendations

72. We recommend that the Committee:

1. **note** that there are at least six known landfills where waste is currently being exposed and discharged to the environment by the coastal erosion or storm events.
2. **note** that a landfill's owner (historically mostly territorial authorities) is responsible for repairing damaged or compromised vulnerable landfills and the remediation of any waste materials discharged to the environment.
3. **agree** to confirm that this continues to be the Government's positon.
4. **note** that the Contaminated Sites Remediation Fund and the Waste Minimisation Fund are currently not designed to include landfill remediation, and at current funding levels could not be readily reconfigured to do so.
5. **note** that vulnerable landfills are only one of territorial authorities' many infrastructure/assets that may be impacted by the effects of climate change.
6. **note** that responding to damaged or compromised vulnerable landfills is placing pressure on local government finances and in some cases, may exceed their available resources.
7. **note** that as part of the Community Resilience work programme, the Treasury, DIA and MfE are developing a framework for the funding and financing of risk mitigation and adaptive behaviours to inform decisions, including decisions to address vulnerable landfills.
8. **note** MfE officials will investigate available options to assist small territorial authorities lacking the financial reserves and resources to address their vulnerable closed landfills via the Waste Minimisation Fund. In practice, this will only be possible if the levy rate increases and/or breadth of landfills covered by the levy increases.

Authorised for lodgement.

Hon David Parker
Minister for the Environment

Hon Eugenie Sage
Associate Minister for the Environment