

# Report



**DATE:** Tuesday 20 August 2019

**TO:** Mayor and Councillors

**FROM:** Erle Bencich, Operations Manager: District Assets

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## FOX GLACIER LANDFILL REMEDIATION & MANAGEMENT OPTIONS

### 1 SUMMARY

- 1.1 The purpose of this report is to present some preliminary options for remediation and/or management of the partially eroded Fox Glacier landfill (subject to further exploration, investigations and costings by staff).
- 1.2 Council seeks to meet its obligations under the Local Government Act 2002 and the achievement of the District Vision adopted by the Council in May 2018, which are set out in the Long Term Plan 2018-28. These are stated on Page 2 of this agenda.
- 1.3 This report is informational in nature, giving Elected Members a status update on investigations currently underway. It concludes with three recommendations for Council: 1) that Council receive this report and the information contained therein, 2) that Council sign off on a staged approach to tackling this issue as a whole and approve the option presented for short-term risk mitigation, while 3) allowing staff more time to progress careful and considered investigations of the long-term options outlined briefly within this report.

### 2 BACKGROUND

- 2.1 This report focuses on remediation/management options for the Fox Glacier landfill, which was partially eroded during a heavy rainfall event in late March 2019.
- 2.2 However, the methodologies outlined in this report as options could also be considered in the future for remediation and management of other erosion-prone landfills in the District, for example, Hari Hari, Hannahs Clearing, Neils Beach (all high risk) and Franz Josef (moderate risk). Exact volumes of materials buried in the landfills above are uncertain. However, best estimates are:

Landfill location	Volume data
Fox Glacier	11,000-15,000m <sup>3</sup>
Hari Hari	10,000m <sup>3</sup>
Hannahs Clearing	2,000m <sup>3</sup>
Neils Beach	2,000m <sup>3</sup>
Franz Josef	15,000m <sup>3</sup>
<b>TOTAL</b>	<b>44,000m<sup>3</sup></b>

### 3 CURRENT SITUATIONS (RISK ASSESSMENT)

3.1 Specialist advice has been sought from an expert in contaminated sites to ensure Council complies with the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS). Jack Grinsted from Golder Associates was engaged to undertake some water and soil samples at the Fox Glacier landfill and Fox River to ascertain potential contaminants. Samples were collected on-site on 7 August 2019. The full results (once collated and analysed) are expected to be received by Council staff by the end of this month.

3.2 Essentially, there are two main options for Fox Glacier landfill:

*Remediation:*  
removing the existing landfill materials, disposing /depositing of them somewhere else that has the necessary consents to receive them, then “making good” the original site.

*Management:*  
retaining the landfill materials where they are in a manner that is secure.

3.3 Council staff have identified three likely methods of long-term remediation and one possible method of long-term, secure management.

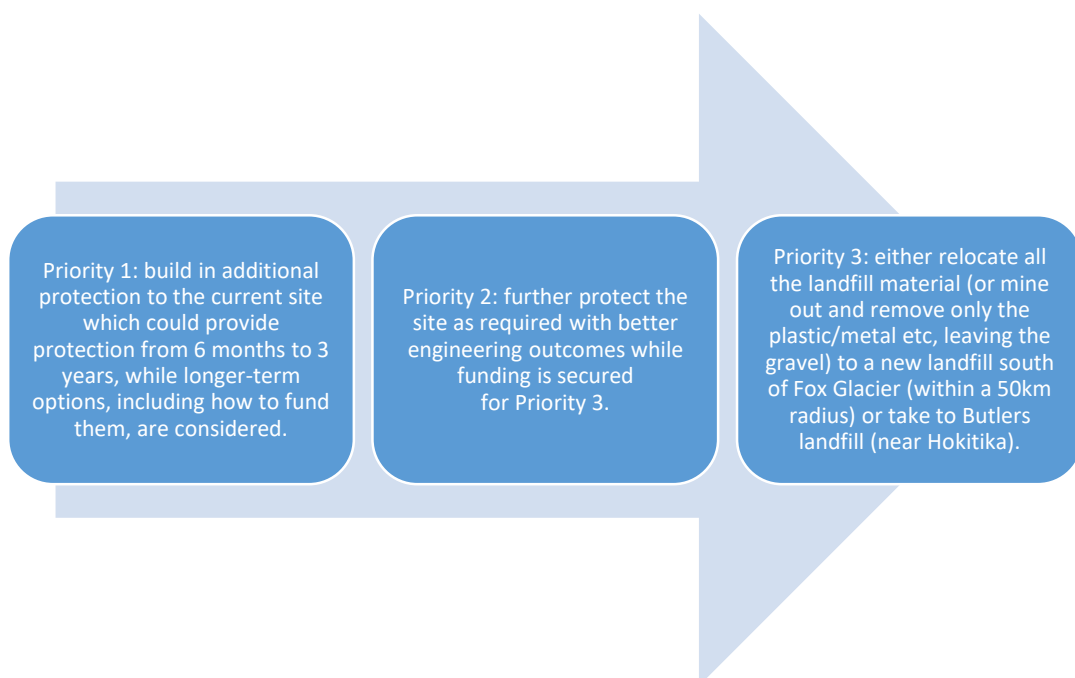
3.4 Each option will have varying financial implications. Remediation costs could include some or all of the following: costs of resource consents, independent expert advice, excavation, transportation (and accommodation of transportation workers), Government Waste Disposal Levy rate and the construction of new landfill cell(s). Costs of securing the existing landfill contents on-site would include Contractors’ costs of labour, site establishment, heavy vehicles/equipment, retainment materials e.g. rock armoury, geotech mesh reinforcement and accommodation of workers.

3.5 There is concern, both internally and externally, including from Department of Conservation, about the possibility of reputational and environmental risks if another significant weather event occurs and no further works have taken place

since WDC's preliminary rock protection and Geofabric work. The difficulty is that this would require another major event, similar to an Act of God, for the incident to repeat in an identical manner to the event of 26 March 2019. No one can predict or forecast such an event. The repair works that were immediately completed including rock protection and Geofabric face cover of the old landfill are currently well away from the normal river flow and the site is in a general safe mode for any normal or marginally increased storm event.

3.6 Nonetheless, further protection of removal of the closed landfill is required. The professional in-house engineering opinion is to agree upon a staged approach, focusing on executing and funding the most urgent priorities, as follows:

**Proposed Staged Approach to Work through Priorities**



**4 OPTION: SHORT –MEDIUM TERM)**

4.1 Priority one is to build in additional protection to the current site which could provide protection from 6 months to 3 years, while longer-term options, including how to fund them, are considered. The proposed methodology for this is as follows. Please note that although these have been outlined as different steps, the whole job needs to be treated and approved as one unit. Separating and implementing individual, but not all of the, parts of this process will put the site at risk.

Short to Medium-term Additional Site Protection Methodology

- Step 1**

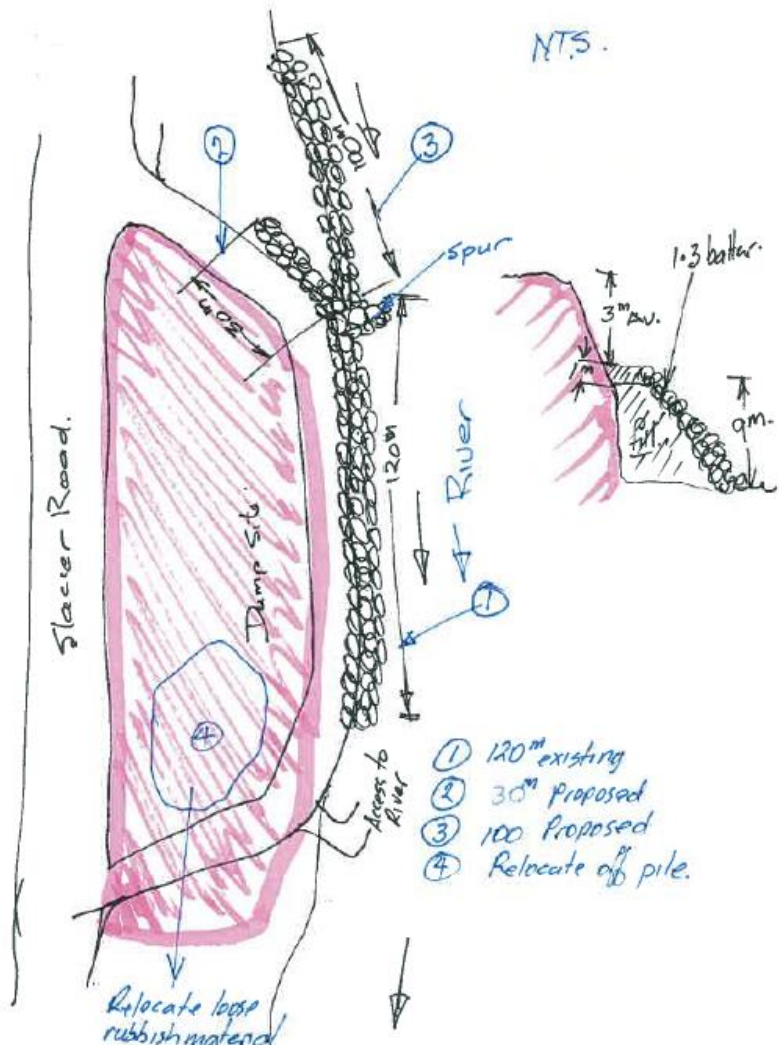
  - Existing rock work - section of existing rock requires batter angle to be increased to 1:3 ratio. Intention is to lift the existing finished level by an additional 1-1.5 metres which will give clearance from river bed of about 9 metres.
- Step 2**

  - Install 30 metres rock wall to fill old dry riverbed channel - this old part of river bed could be filled with rock wall to prevent river cutting back into this channel if other rock is compromised upstream (If this channel is not filled and allowed to run, a similar weather event could take out remainder of landfill).
- Step 3**

  - Install 100 metre of Rip Rap upstream of the existing rock work - this is to protect river erosion from upstream potentially cutting into the top area of the landfill and cutting in behind the protection works in place.
- Step 4**

  - Remove the loose rubbish material off the top of the existing landfill and level out the remaining material - this will allow for encapsulating material to be installed over the top. Majority of loose material on top is wood.

Sketch of Fox Glacier Landfill Area Showing Proposed Rockworks Improvements



## OPTIONS (LONG-TERM)

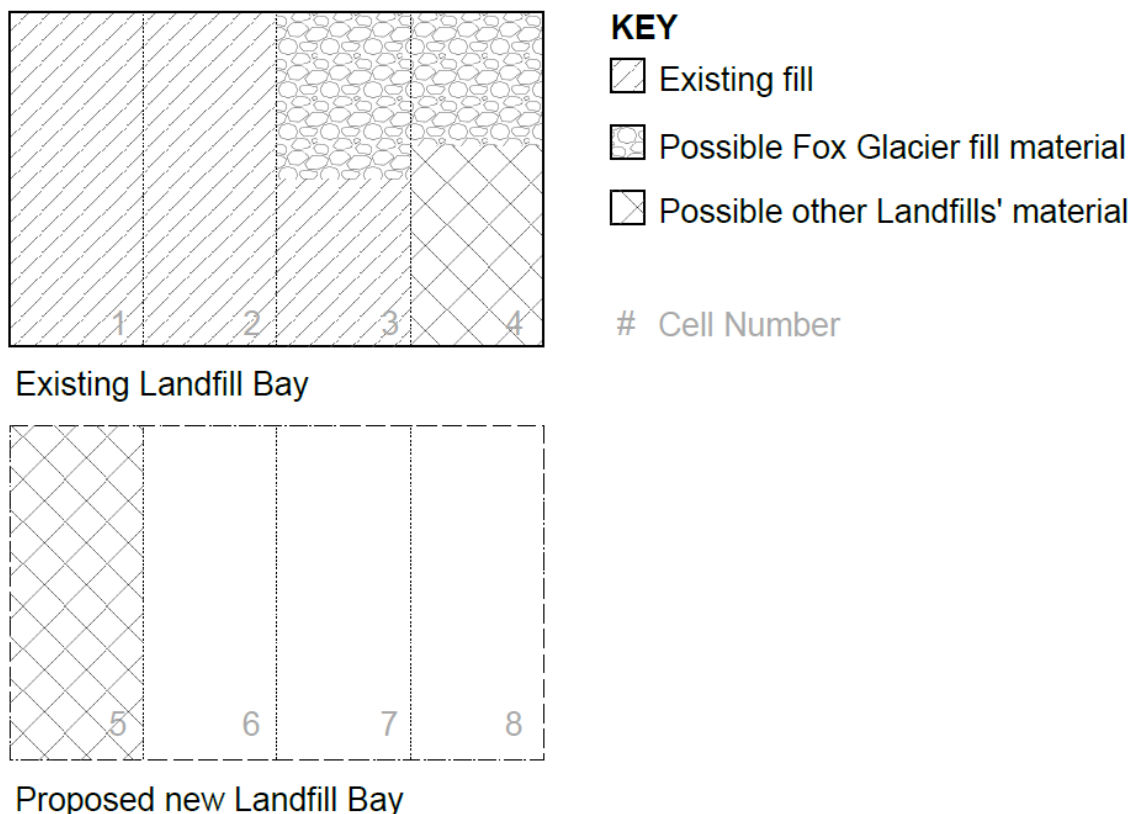
4.2 The first long-term remediation option is to remove the contaminated materials from Fox Glacier landfill and re-site the materials at Butlers Landfill. Butlers is the ideal site to receive this at present as it is the only landfill in the District currently consented to receive most materials (with the exception of medical waste and bulk liquids). However, the quantity of materials deposited at Butlers would require a new cell (of 70,000m<sup>3</sup>) to be constructed at Butlers. This is because Butlers landfill currently has approximate volume remaining in its open cell of 21,500m<sup>3</sup>. Therefore, depositing the estimated volume of material from Fox Glacier landfill (11,000-15,000m<sup>3</sup>) would mean Butlers landfill would be left with approximately two to three years of life for the general public. (Every 3,000 cubic metres of materials deposited at Butlers reduces the landfill life by a year.) Should all the erosion-prone landfills listed in 2.2 above be remediated in the same manner, the open cell at Butlers would be completely filled plus another 11,500m<sup>3</sup> of contents would need to be deposited into the new (as yet unbuilt) cell. This would reduce the lifespan of the new cell (based on an original cell life of 20 years) by 4 years giving approximately 16 years of life remaining. See diagrams below:

*BUTLERS LANDFILL SITE MAP (showing existing landfill cell and site of new cell)*



BUTLERS LANDFILL SCHEMATIC (showing landfill volumes and impact)

### LANDFILL VOLUME SCHEMATIC



4.3 An alternative remediation option is to create a new landfill at or near Fox Glacier to receive the existing Fox Glacier landfill waste. This would provide advantages over depositing at Butlers as it would significantly reduce the transport costs (potentially millions of dollars). The added benefit to the community and Council (should a large enough site be found) would be having an open landfill situated between Hokitika and Haast. This could also achieve synergies with wastewater desludging projects. Currently both the Fox Glacier and Haast oxidation ponds require desludging and the only landfill consented to receive sewage sludge is Butlers which is a large distance from both Fox Glacier and Haast. (Haast landfill cannot receive the contents of other landfills nor sewage sludge as its resource consent has much tighter conditions on the types of materials able to be received.)

Resource consents would need to be sought for a new landfill and the desire would be for the new landfill (near or in Fox Glacier township) to be permitted to receive nearly all types of waste similar to the consent conditions of Butlers. Achieving the necessary resource consent for a new landfill would typically take many months. However, the high level of local and national interest in this issue post the Fox Glacier landfill event may enable us to expedite this process if the attention of key staff members is prioritised in this area. Conversations will be had with the West Coast Regional Council, contaminated site experts and other

external stakeholders on how to best work together with haste for the benefit of the community and natural environment.

- 4.4 The third option is to remove only the bulky waste (e.g. plastic/steel) via a mining extraction process and leave the gravel. This could significantly reduce the volume that needs to be uplifted and the effect on the receiving landfill, and thus decrease costs. This method has proven effective in case examples in Canada. Soil samples undertaken on-site on 7 August 2019 show no asbestos or other concerning contaminants present in the soil which could make this a suitable option. A full report on this option is being prepared by Golder Associates at present and is expected to be received by Council staff by the end of this month.
- 4.5 The fourth option is to cover and manage the contaminated Fox Glacier landfill site with a watertight, UV-resistant and extremely durable geotech mesh reinforcement material and to encapsulate this and protect via rock earthworks. Investigations are continuing into the suitability and specifications of geotech mesh reinforcement and the correct rock type to ensure something that is longer lasting. Staff note the volatile, unpredictable nature of weather patterns in Westland. Resource consents would also be needed for this.

## **5 SIGNIFICANCE AND ENGAGEMENT**

- 5.1 The widespread media and public interest in the Fox Glacier landfill erosion event, the potential for negative environmental impacts and the large financial implications indicate that this is a high significance issue for Council. At the moment the level of engagement is with regulatory stakeholders and qualified contaminated site experts to best determine the way forward and obtain appropriate advice.

## **6 ASSESSMENT OF OPTIONS (INCLUDING FINANCIAL IMPLICATIONS)**

- 6.1 More expert inputs are needed to appropriately estimate the financial implications of each options. Therefore, no decisions are sought at this stage until all the relevant financial, scientific, regulatory investigations have been completed.
- 6.2 Indicative financials costs and time frame for option 4.1 (short-term priority) is as follows:
- 6.2.1 20,250 tonnes of rock is expected to be required. Verbal conversations with Department of Conservation (DoC) have agreed to Council taking the rock from the river bed. Cost of contractor rock protection works forecast to be \$23 per tonne, for a total of \$465,750 (this includes accommodation and travel which has been factored into the unit rates). Written confirmation of permission to extract rock from the riverbed needs to be sought from DoC. Should this agreement of rock provision fall through costs would be significantly higher of up to 75%.

Production rate is expected to be 800 tonnes per day – taking 25 days to complete, exclusive of any weather delays, for example river being in flood or too high.

- 6.2.2 Establishment and dis-establishment for equipment is estimated at \$16,000.
  - 6.2.3 Although central government financial assistance is being sort, as yet this is not confirmed. This would mean the project would be unbudgeted and require loan funding.
  - 6.2.4 A resource consent for the enhanced rock protection would be needed in accordance with the Resource Management Act (1991) due to the volume and the location. This would likely be actioned in combination with a retrospective consent application for emergency rockworks undertaken at the time of the event.
- 6.3 Indicative financial costs of option 4.2 could be in the vicinity of at least \$1.2 million for transportation/extraction plus another at least \$1 million for new cell construction cost as the life of the existing Butlers landfill will be almost completely lost. A new landfill cell consent would need to be sought and this could take years for approval as well as resource consent consultancy expenditure.
- 6.4 Options 4.3-4.5 (inclusive) have not been costed at this stage.
- 6.5 No funds for any of the long-term options have been set aside. Therefore, any immediate actions taken at this time would represent unbudgeted expenditure. As a result, it is recommended that the long-term options be carefully considered and decisions made as an amendment to the Long Term Plan through the appropriate process.

## 7 RECOMMENDATION(S)

It is therefore recommended:

- A) **THAT** Council receive this report as an informational update on progress made to date and the likely options moving forward.
- B) **THAT** Council sign off on a staged approach and approve the short-term option presented to mitigate potential reputational risks to Council and environmental risks should a weather event of similar intensity occur before long-term options can be assessed, funded and implemented.
- C) **THAT** Council support staff in progressing their investigations into the engineering methodology, financial implications and funding mechanisms of the long-term options outlined above.

**Erle Bencich**

**Operations Manager: District Assets**



Refer *Appendix 1: Photos of Fox Glacier Landfill*

APPENDIX 1: FOX GLACIER LANDFILL PHOTOS



