Bench

OTAGO REGIONAL COUNCIL HEARING
MONDAY 23RD MAY 2022

Reference:
Dunedin City Council Smooth Hill
Resource Consent Hearing
RM 20.280 -LUC -202.405

SUBMISSION

Presented by

Ronald J. King

BE Mineral (Otago) Lth DipRE (Melbourne)
Australia and New Zealand qualifications in Mining and Education
Fellow Aus IMM
Hon Fellow NZIOQ

CONTENTS

1. Introduction

Thank you to the DCC staff for providing me with records of the early investigation work on Smooth Hill and to the Otago Regional Council for allowing me the privilege of making a presentation at this hearing.

I was requested to review the Smooth Hill Waste Disposal Proposal by Mr and Mrs Tony and Michelle Granger of RN731 Big Stone Road. They are adjacent neighbours on the south side of the proposed active area of the proposal and maintain a large forestry block.
They asked me for my professional evaluation of the project and to express their concerns.

2. Personal Experience

My major involvement in waste storage facilities was as Special Duties Inspector NSW for disposal of mine tailings at Captains Flat that were polluting Lake Burley Griffen (Canberra); gold tailing disposal in the Broken Hill water supply catchment; approving the establishment of the largest earth tailings dam in the Southern Hemisphere at *Ranger Energy Resources* Australia mine, Northern Territory; one of two Australian representatives on the OECD in Paris, considering international disposal methods for radioactive wastes.
Incidentally, I also wrote the conditions on the Mining Permit for McCraes Mine and was on site at the securing of the tailings dam foundation.

3. Site Selection

The first aim in any waste disposal is to find the lowest, dry, stable ground close to the source of waste.
The reasons are obvious. All other conditions are irrelevant if the ground is insecure and containment can be interrupted. Remedial action is difficult.

4. Smooth Hill Site.

This proposal is at 'the top of a hill'; bore holes indicate a high aquifer BH201 *'artesian groundwater flowing out of the top of the borehole'.*
It is between two major faults, one 6 km distant (the Akatore), on which there was movement in 1974(?) and the Titri, given as 3 km distance but the Figure 4, *Bishops 1954 Geology of Milton Area Map (page 9) GHD Geotechnical Interpretive Report May 2021* shows a major lithological change 2 kms away to the North along McLarens Gully. If this is a fault, it is an orientation that should cause concern!

'although no faulting was found during the site mapping'. GHD Geotechnical Interpretive Report page 11.
Recent work by the Universityof Otago at Milburn to assess The Titri Fault's activity may be relevant ~~to the Titiri Fault activity~~ but has not been included.

This site is 35km from Dunedin centre.

5. Alternative Locations
The proposition to consider alternative locations has been raised (ref: ATT12WYNN WILLIAMS8/4/22. Michelle Melhop-ORC Section 42A Staff Recommending Report).

Technology is pushing for recycling as an alternative.
If, however, landfill is required, there are more suitable sites available in Otago. Southland is using King's Limestone Quarry -ideal for this use.

Upstream from the Green Island site is the old marl and limestone, ex-cement works quarry at Burnside that may be suitable.

6. Site Problems
To say that 'the Council has reconfirmed the technical suitability of Smooth Hill for the disposal of waste (page 4, GHD Geotechnical Factual Report) is questionable. Already this site has revealed problems and the size has been reduced by over half from 44.5 hectares to 18.6 hectares and the life from 55 years to 40 years.

However, whatever the situation today there are usually engineering solutions available where cost is not a consideration. GHD has put forward a proposal which puts the ~~proposed~~ area to fail safe to a gully draining to the Taieri River.

7. Design Details
The dump at this stage of design is based on the lower end of safety in using a figure of 11 degrees (for the dip of the Henley Brechia basement) when the measurements range from 10 to 15 degrees -*'sandstone bedding 10 to 15 degrees'* (page 15 GHD Interpretive Report) and the regional dip is reported by Bishop 1944 as 15 to 30 degrees'.
Similarly, for adjustment for earthquake considerations, the Alpine Fault -340 km away – is the reference used instead of the adjacent Titri Faults(using the standard bridge design manual.)

8. Review Process
Examination of the surfaces following the stripping of the loess overburden should improve knowledge of the slopes and if there are earthquake effects.
The proposal for a technical reference group to oversee the construction and operating stages in support of a full time onsite qualified experienced construction engineer is commendable. This group should be onsite for critical establishments such as keying in the bund (or toe dam) and to check the processed loess performance as a land fill liner and capping material.

9.Risk Analysis
Although the safety situation in connection with various aspects of the design and operation are dealt with, there does not appear to be a formal risk analysis for the

project as related to possible harm.
a. The local airport would put bird strike at the top of the list (Note: we used high frequency sound to disperse the sound of blasting in Sydney. It annoyed all the dogs in the neighbourhood. It may work with birds.)

b. High on the list must be road transport. Sixty kilometres both ways for forty years is bound to generate accidents!

c. The operation itself includes working high faces '*in excess of ten meters*' which will be of concern to WorkSafe.

d. The area is surrounded by commercial and private pine plantation. The land fill operation, generated gas and deposited flammables, transport and power supply lines, **all pose a high risk of fire especially in summer. This is of great concern to adjacent neighbours. There should be facilities with capacity and personnel on site to stop fires quickly.**

e. The excavation and transport and the loess overburden in combination with lime, combined with the dumping of solid, imported waste fill and the movement of equipment generally will generate dust. Some of the dust may be contaminated. This will affect residents' rural water supply and their living space. Water storage in quantity perhaps from artesian sources should be incorporated in the facilities for both wetting down and fire fighting.

f. Road and operational noise is objectionable to the rural community, especially if the operation is seven days a week. They have bought property to get away from this environment and to have continuous or intermitant industrial noise for forty years is just **not acceptable**. With the proposal to sort rubbish at Green Island or Dunedin therewill be a limit to the quantity to be transported to Smooth Hill. It would seem logical to reduce overtime costs to operate during the week days with Saturday morning for solid imported wste dumping and covering so as to **leave Saturday afternoon and Sunday free of noise, smell and dust**

10. Conclusion

Favourable consideration of these suggestions would be appreciated.

Thank you.

Ronald J. King

In summary:

The Smooth Hill site is -

- at the top of a hill - thus requiring additional design features to overcome GRAVITY

- The containment area is on an artesian aquifer which could lubricate the foundations of the structure.

- It is too close to substantial historic faulting to guarentee stability.

- and it is too far from the major source of waste.

In addition:

The proposed containment design is based on lower safety factors than should be acceptable.

and there has been no formal RISK ASSESSMENT which would highlight the dangerous effects on neighbours of:

excessive ROAD TRANSPORT

high fire RISK

contaminated DUST generation

persistent NOISE 7 days a week.

Ron King