

POLLUTION AND NORPAC: A CHRONOLOGY TO 1980; THE
LEGACY OF THE LAST MINING DONE AT TUI

Philip Hart

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Historical Research Unit
Faculty of Arts & Social Sciences
The University of Waikato
Private Bag 3105
Hamilton, New Zealand

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Contact: prhart1940@gmail.com



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POLLUTION AND NORPAC: A CHRONOLOGY TO 1980; THE LEGACY OF THE LAST MINING DONE AT TUI

Abstract: *This paper does not focus on the mining undertaken at Tui from the 1960s until Norpac ceased operating, but instead concentrates on its environmental impact. To clarify the struggles to prevent and then to rectify the pollution, the story is outlined chronologically. It is a story about a company seeking to avoid additional costs by evading, if possible, some of the environmental constraints that were imposed, and, once it abandoned the field, leaving the clean up to others. Not till the twenty-first century was the problem finally solved.*

PRELUDE TO NORPAC

South Pacific Mines, a private Canadian company, first commenced mining investigations in New Zealand in 1959, having acquired claims in various areas in the Coromandel-Hauraki mining field. Late that year it was considering re-opening mines in the Ohinemuri and Te Aroha areas, and in particular in treating the sands in the Ohinemuri River which, because of the inadequacies of earlier treatment methods, still contained gold. This immediately raised concerns about the rivers being turned into sludge channels. In mid-1960 there were meetings with the catchment board and other local bodies, which were worried about cyanide leaking into the rivers and affecting dairy factories.¹ Dr John Francis Dawson, the Medical Officer for the area, who in the late 1940s had been concerned about the impact of mining on the Te Aroha water supply,² said the river would be testing for cyanide pollution. In contrast, Alfred Allen of South Pacific Mines assured the public that there would be no need for this because the cyanide ‘was neutralized before it was discharged, and there was absolutely no danger. One mill in Canada discharged into a lake which provided a town water supply’.³

After concentrating on the Ohinemuri area, in early 1962 some initial work was done at the Tui. After prospecting for only a few weeks, the

¹ Press Statement, 22 August 1960, in A.M. Isdale, ‘Meetings with Catchment Board and Te Aroha Borough Council People’, typescript, 17 June 1969, p. 1, Norpac Papers, MSS and Archives, Vault 4, Box 1, NMC 5, University of Auckland Library (hereafter UA).

² See paper on pollution in the Te Aroha Mining District.

³ Isdale, p. 1, Norpac Papers, Box 1, NMC 5, UA.

company claimed that in July ‘the people at Te Aroha wanted us to take up special Quartz Claim, “for permanency”’. Bert McAra, formerly the Auckland Smelting Company’s first mine manager at Tui and now the Inspector of Mines for the district,⁴ ‘kept agitating for us to do this for a long time thereafter’.⁵ Further exploration was disrupted by Norman Annabell, Te Aroha’s Borough Engineer, refusing access to the waterworks reserve. After Dr Arthur Pentland, a Canadian geologist who was managing director of South Pacific Mines, interviewed local body members on 3 August, he noted that ‘even ones thought to be against in support’.⁶ A meeting with Annabell and the borough solicitor was held three days later to discuss access, and that evening Pentland talked with McAra and Benjamin John Dunsheath ‘against being turned aside’.⁷ Dunsheath had been managing director of the Auckland Smelting Company, which had mined at Tui ten years earlier.⁸ On 10 August, Alistair Isdale, who was the company’s secretary and accountant, ‘found through engineer Annabell that Borough Council wanted filtration plant if mining, according to Health Officer (they said) (which would have meant Company being responsible for cost). But Health Officer when telephoned said no such thing’.⁹ He recalled in 1969 that Henry William Dickens Skidmore, the mayor of Te Aroha, talked to him of having to provide a filtration plant costing £10,000; however after the Health Department reported its satisfaction with faecal samples, on 14 August ‘Mayor Te Aroha rang - O.K. for Tui’.¹⁰ Skidmore and others continued to worry about bacteriological samples, and Isdale recalled that ‘the Borough continued niggling at intervals about who data about our samples was to go to. The pathologist at Thames Hospital thought they “were just being difficult.” (22 Feb. 1963)’.¹¹ Despite this alleged obstructiveness, on 16 August Annabell informed the manager of South Pacific Mines that the borough had granted permission to use the ‘Tui Mine

⁴ See paper on the Auckland Smelting Company.

⁵ Isdale, p. 1, Norpac Papers, Box 1, NMC 5, UA.

⁶ Isdale, p. 2, Norpac Papers, Box 1, NMC 5, UA.

⁷ Isdale, p. 2, Norpac Papers, Box 1, NMC 5, UA.

⁸ See paper on the Auckland Smelting Company.

⁹ Isdale, p. 2, Norpac Papers, Box 1, NMC 5, UA; see also Memorandum by J.B. McAra, 10 August 1962, Inspector of Mines, Box 16B, 13/11/D, vol. 1, Inspector of Mines files held by Ministry of Commerce, Hamilton (hereafter MC).

¹⁰ Isdale, p. 2, Norpac Papers, Box 1, NMC 5, UA.

¹¹ Isdale, p. 2, Norpac Papers, Box 1, NMC 5, UA.

Track' to get to their prospecting license; the company was reminded not to create any pollution.¹²

On 24 December, South Pacific Mines applied to prospect 1,000 acres stretching from the old mines at Tui to those at Stoney Creek. There were immediate objections on the grounds of pollution, not only by the Te Aroha Borough Council but also by the Paeroa Borough Council, to protect the Waitawheta Valley catchment that was part of its water supply, and the Tourist Department to protect the Hot Springs Domain. The Te Aroha council pointed out that the area was part of its catchment and that some of its streams had been exempted from mining by the Te Aroha Borough Water Supply Empowering Act of 1962.¹³ As a result of the objections, the application was withdrawn in May 1963 and replaced by one for a special quartz claim of 100 acres at Tui.¹⁴ In July, the council approved their solicitor's lodging a formal objection. One councillor, Herbert Leslie Hill, who wanted the council to support mining in every way possible, was told that approximately two-third of the borough water supply came from this area. Hill therefore seconded the amendment finally adopted that the council would be prepared to waive its objection 'provided the conditions imposed on previous licenses, for the protection of the Borough water supply be imposed'.¹⁵

The recommencement of mining led the council to consider moving its water supply intake from the Ruakaka area to streams further to the southeast, if a subsidy could be arranged.¹⁶ By December 14 men were working in the 'Tui lead mine', and the directors were considering building a mill nearby.¹⁷ The local body was now more enthusiastic about mining, possibly because a new engineer, Graham Bower Thorpe,¹⁸ had (briefly)

¹² Norman Annabell to Manager, South Pacific Mines Ltd, 16 August 1962, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹³ Te Aroha Warden's Court, Mining Applications 1962, 11/1962, BCDG 11289/5a, ANZ-A; for an explanation of the intent of this Act, see *New Zealand Parliamentary Debates*, 16 August 1962, vol. 331, p. 1490

¹⁴ Te Aroha Warden's Court, Mining Applications 1962, 11/1962; Mining Applications 1963, 2/1963, BCDG 11289/5a, ANZ-A.

¹⁵ *Te Aroha News*, 26 July 1963, p. 1.

¹⁶ *Te Aroha News*, 23 August 1963, p. 1.

¹⁷ *Te Aroha News*, 17 December 1963, p. 1.

¹⁸ *Piako Electoral Roll, 1963*, p. 241.

replaced Annabell, who had resigned because of ill health,¹⁹ and Skidmore was given several guided tours of the mine. After one such visit in October, Isdale noted Skidmore as being ‘enthusiastic’ because Te Aroha had been ‘going down’ and was now ‘coming up’ with the television transmitter being erected and mining reviving.²⁰ When Isdale gave a lecture to a seminar at Thames on the mineral possibilities of the peninsula, he was introduced by Skidmore ‘in a cordial atmosphere to catchment board representative Mr Harris.... Mr Skidmore told me the “number of men allowed at Tui could be liberally interpreted”’.²¹

The next move noted was on 10 June 1964, when Skidmore told Pentland he was ‘willing to give site for battery on water reserve up hill’ and wanted to supply electricity ‘rather than the Power Board - he would put it in free and charge low rates’.²² Late that year, Carlton Skinner, an American director of South Pacific Mines, visited the mine after first meeting with the Minister of Mines, whose department had met some of the prospecting costs. In a press interview he gave an optimistic assessment of the amount of ore to be mined, and said that arrangements were being made to form a new company with its subsidiary North Island Mines and the New Zealand company Cable Price Downer. The company was considering possible sites for a flotation plant and smelter near Te Aroha. Any site would ‘have to be carefully situated because of fumes from the smelting operations and the need to make provision for the disposal of substantial quantities of waste materials’.²³ After further discussions, approval to mine under a prospecting license was granted by the warden on 15 June 1965, subject to the condition that the water supply be protected.²⁴ By this time the company had added 3,000 feet of tunnels to the 1,500

¹⁹ *Te Aroha News*, 24 May 1963, p. 5; interview with Frederick Maurice Alfred (Sam) Guernier, in *Te Aroha*, 18 August 2001; Death Certificate of Norman Annabell, 21 November 1968, 1968/39742, BDM.

²⁰ Isdale, p. 2, Norpac Papers, Box 1, NMC 5, UA.

²¹ Isdale, p. 2, Norpac Papers, Box 1, NMC 5, UA.

²² Isdale, p. 2, Norpac Papers, Box 1, NMC 5, UA.

²³ *Waikato Times*, 7 November 1964, p. 17.

²⁴ Te Aroha Warden’s Court, Mining Applications 1965, 4/1965, BCDG 11289/5a, ANZ-A; I.E. Feasey to F.J. Handcock, 23 October 1968, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha; *Te Aroha News*, 13 October 1959, p. 5.

driven by earlier miners, and anticipated the mine lasting at least 15 years, producing 100 tons daily of high-grade lead, zinc, copper, silver and gold.²⁵

On 7 December Pentland, Isdale, Skidmore, councillors and borough staff discussing using ten acres at Fern Flat near the mine for a treatment plant and tailings site.²⁶ The borough representatives wanted guarantees that the purity of the water supplied to the dairy factory and town would not be harmed. They were told that a pipe along the bottom of Fern Flat would ensure that the small stream there would not be polluted by tailings,²⁷ that the tailings dam would be secure, and that the tailings would be stable during rain because of 'quick setting of finely ground material'. They were assured that the system used in the dam 'would have cementing effect' and prevent any seepage.²⁸ Isdale was investigating several sites on flat land near the town that could be to dump large quantities of tailings.²⁹ The *Te Aroha* announced that a flotation mill was to be erected and that an additional mineral, cadmium, would be produced.³⁰ No mention was made of mercury, although it would cause the end of mining at Tui.

NORPAC

1966

On 6 December 1965, Norpac Mining Limited was registered. A private company, it was owned by North Island Mines, a private Californian company which had helped South Pacific Mines develop the Tui mine since 1962, South Pacific Mines, a private Canadian company, and the New Zealand public company Cable Price Downer. The latter was involved

²⁵ *Te Aroha News*, 6 July 1965, p. 1.

²⁶ *Te Aroha News*, 6 July 1965, p. 1.

²⁷ A.G. Pentland to Town Clerk, Te Aroha Borough Council, 18 November 1965, Tui Access [etc] file, Norpac Papers held by Mineral Resources (in 1986) at Union Hill, Waihi, and made available, before their destruction, by Eric Coppard of Waihi (hereafter Union Hill).

²⁸ Alistair Isdale, 'Conversation with Mr Skidmore etc., 7/12/1965', typescript, Norpac Papers, Box 1, NMC 5, UA.

²⁹ Alistair Isdale, 'Land for Tailings etc. on Flat. Examined 7/12/65, and Conversation Mr Bowler', Norpac Papers, Box 1, NMC 5, UA.

³⁰ *Te Aroha News*, 7 December 1965, p. 1.

because the government required some local participation in the venture, which had been difficult to arrange.³¹ Its name was a combination of NORth Island Mines and South PACific Mines.³² A meeting between mine manager, metallurgist and assayer, and the company secretary later that month considered methods of disposing of the tailings. There was a possibility of filling in a valley on land rented on the Dick Estate at Te Aroha, or of selling the sands for pre-stressed concrete. They decided to consult the Hauraki Catchment Board about the feasibility of using shallow-draught barges to take them to Auckland. All the grinding and flotation would be done at Fern Flat, only the tailings being piped to the flat. As large sums were spent extracting sand from the Waikato River and then having to get rid of the pumice, whereas the pyrites in the Tui tailings were separable by flotation, they were optimistic about sales; some firms had already expressed interest.³³

These three men discussed methods of disposing of tailings with Arthur Downer, Norpac's chairman of directors, on 10 January 1966. They estimated that from 20,000 to 24,000 tons of sands would be produced each year, which, if free of pyrite, could be used for pre-stressed concrete. If the sand was separated by grade, there could be a profitable sale of the higher quality material (£6 per ton and more was postulated). Good grade white quartz chips would be sold for around £20 per ton. Crushed mullock could be sold for road making.³⁴ A week later, methods of sieving the material and piping it to the base of the mountain were discussed, and it was decided to investigate land near Te Aroha as a disposal area. 'Possibilities of requiring

³¹ Roger Dewhurst to R.W. Harris, Memorandum entitled 'History of Tui Mine and Tailings Dam', 26 October 1978, Hauraki Catchment Board (hereafter HCB), Series 1, Box 206, 2/7, vol. 2, held by Waikato Regional Council, Hamilton (hereafter WRC); Earl Kent Massey Palmer and Hamer to Secretary of Mines, 7 March 1975, Inspector of Mines, Box 16A, 13/25, vol. 1, MC.

³² Norpac Papers, Box 1, NMC 1, UA; *Te Aroha News*, 7 December 1965, p. 1; E.K. Haddy (Secretary, Norpac Mining Ltd.) to Chief Cashier, Reserve Bank of New Zealand, Norpac Papers, Reserve Bank of NZ file, Union Hill.

³³ Notes of Meeting of 22 December 1965, Norpac Papers, Correspondence: Downer file, Union Hill.

³⁴ Notes of Meeting of 10 January 1966, Norpac Papers, Correspondence: Downer file, Union Hill.

only limited area, and of ultimately selling all sand. (Room Fern Flat for some temporary disposal)'.³⁵

FRANK HANDCOCK

From 1 February 1966, Frank Joseph Handcock was the full-time general manager of Norpac. He had worked for Downer and Co. for many years, had 'wide civil engineering construction experience, including open cast mining',³⁶ and was devoted to its interests. A history of this company recorded that he had worked for it since 1941.³⁷

He had been working on a programme of bridging level crossings when Arnold Downer engaged him. His first major job was to take charge of building a bridge at Orawaiti, the first bridge on which the company made any real money. From Orawaiti Frank Handcock went to the Cobb. In 1940/41 he was on Downers' second major Waipori hydro contract, the driving of a duplicate supply tunnel to the No 2 power station, before going on to Fiji. After the war Handcock's positive approach, his steadfast refusal to let any setback undermine his confidence, his skill at setting up a job, and his qualities of leadership were to be tested to the full when he became project manager at the Roxburgh hydro-electric project.³⁸

His personality would be a feature of the coming conflicts over pollution. One miner recalled him as being 'pig-headed and arrogant' and very hard to deal with, his mood not being improved by a heavy intake of whisky and brandy.³⁹ He lived in a little bach on the mine site, right next to the mill, only going home on weekends. 'He was not the sort of man whom I

³⁵ Notes of Meeting of 17 January 1966, Norpac Papers, Correspondence: Downer file, Union Hill.

³⁶ A.F. Downer to J.F.A. Taylor, 15 February 1967, Norpac Papers, Box 1, NMC 35, UA; for full details of his career, see Mines Department, MD 1, 17/11/1584, Mines Department, Wellington.

³⁷ Arthur Manning, *Walking Tall: the Downer story 1933-1983* (Wellington, 1983), p. 2 [This booklet omits any mention of Downers' involvement with Norpac].

³⁸ Manning, p. 11; for photograph of Handcock, see p. 12.

³⁹ Interview with Eric Coppard, Waihi, 7 July 1995; James Henry Lynam, in interview on 1 July 1995 at Te Aroha, confirmed the heavy intake of whisky, as did Dave Nelson, Norpac's plant electrician, in a telephone conversation on 7 October 1996.

felt ... that you could rely on or trust.... He reminded me of an old fox, he was pretty sly, pretty cunning, and ... he would obtain his ... end by almost circular reasoning, and he wasn't particularly well-liked'.⁴⁰ A borough councillor recalled him as 'a typical Australian' who drove a hard bargain in his attempts to obtain cheap electricity and low rental for the land occupied.⁴¹ James Henry Lynam, Transmission Superintendent for the New Zealand Broadcasting Corporation, recalled him as a 'very hard man' who was solely concerned with Norpac's interests and whom outsiders like himself found very hard to work with. He disliked government departments, local bodies, and public servants of all varieties, and 'rode rough-shod over everyone'. As for the environment, 'he couldn't have cared less', and was unwilling to spend any money controlling pollution. When Lynam complained of mullock washing across the mountain road, Handcock denied responsibility, claiming it was mining debris from the previous century - until shown that it included tannalised pine and plastic-covered electric wire.⁴² To prove an interest in enhancing the environment, he planted 'a dozen or so Hydrangeas and a number of other flowering shrubs' outside the office at the mill; 'all eventually succumbed to the toxic soil'. Lynam recalled that he 'blatantly disregarded' environmental restraints and managed to hoodwink the authorities, 'especially the Mines Dept'.⁴³

These attitudes to Handcock and the mining interests he championed were occasionally recorded at the time. In 1970, for example, John Reginald White, town clerk from 1968 to 1977, after an exchange of letters with Handcock over pollution and financial issues told the Minister of Mines that his council had 'endeavoured at all times to be reasonable in its many dealings with the Company but such reasonableness' was 'apparently regarded as weakness rather than courtesy and a desire to assist'.⁴⁴

So devoted was Handcock to Norpac that, at a meeting of the Board of Directors of Norpac held on 11 August 1971,

the Board expressed its appreciation of the time and effort Mr Handcock had expended on the Company's behalf but it was felt

⁴⁰ Interview with Eric Coppard, Waihi, 8 December 1985, p. 61 of transcript.

⁴¹ Interview with Sam Guernier, Te Aroha, 18 August 2001.

⁴² Interview with J.H. Lynam, Te Aroha, 1 July 1995.

⁴³ J.H. Lynam to Philip Hart, 30 September 1996.

⁴⁴ J.R. White to Minister of Mines, 21 December 1970, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

that he was not being completely fair to himself or to his wife and family with his present arrangements. Accordingly he was instructed to extend the length [of] time which he spent at his home in Auckland at the weekends.⁴⁵

Handcock's irritation with those who interfered with the way the company ran its mine, thereby increasing costs, was reflected in a comment when Norpac had to seek new markets after the Japanese refused to take further concentrates because of their mercury content. Handcock 'claimed that his Company was being aided in negotiation by what he termed the growing realisation in the western world that it had over-reacted on some aspects of the pollution debate'.⁴⁶

PLANS AND CONCERNS

In an interview with the *Te Aroha News* published on 4 February, Handcock gave details of the mill to be built at Fern Flat, 1,000 feet up the mountainside. Of the ore treated, about 20 percent would be shipped to Japan as concentrates for smelting, the remainder being 'finely powdered to a degree that it resembles cement', the company hoping 'to find a ready market for it as first class concreting material'.⁴⁷ Five days later, he confidently informed Norpac's directors that the finely ground tailings 'would be ideal for the construction industry and could be a valuable by-product of the mine'. He claimed that the Ministry of Works 'had expressed interest'.⁴⁸ But already the company was having doubts about piping tailings to depressions at the foot of the mountain. In March, Downer wrote that he opposed the plan to carry fines in a 2-inch pipe because 'both cost wise and operationally this would not ... be as trouble free' as previously thought.⁴⁹ (He was correct: the amount of kaolin in the mullock caused pugginess and would have made such a long pipeline impractical.)⁵⁰ Downer

⁴⁵ Minutes of the 36th Meeting of Directors, 11 August 1971, Norpac Papers, Box 9, UA.

⁴⁶ *Te Aroha News*, 17 April 1973, p. 1.

⁴⁷ *Te Aroha News*, 4 February 1966, p. 1.

⁴⁸ Minutes of Second Meeting of Directors, 9 February 1966, Norpac Papers, Box 9, UA.

⁴⁹ A.F. Downer to F.J. Handcock, 22 March 1966, Norpac Papers held by Inspector of Mines, Box 17B, file X98, MC.

⁵⁰ See, for instance, F.J. Handcock, Report 10/6 for period ending 2 October 1971, Norpac Papers, Box 6, NMC 19/6, UA.

proposed using the three to four acres at Fern Flat for a tailings pond; this could be created 'by excavating say 5 feet below surface, and stop banks say 10 feet high'. The tailings could be recovered later if proved to be of commercial value.⁵¹

An indication of the difficulties a dam would encounter in an area of high rainfall had already occurred. At the end of February, heavy rain caused serious flooding in the Ohinemuri and Te Aroha districts, and its impact on the Tui mine site was graphically reported by Isdale:

Water is gushing from 3 level, making a waterfall, and the tip frame is out in mid air. The road to 4 level has suffered extensive damage.... Where the stream crosses the road from 3 at top, there is some debris.... From there to 4 level and half way down to 5 the stream bed has been thoroughly gutted. Everything went, huge boulders and all, successive blockages further and further down became bigger and were successively swept away.

At 4 the iron at the end of the building overlooking the stream, now high up and on the edge, was badly battered. On the side a moraine of big rocks and tree trunks is piled up nearly as high as the building and has filled the drying room almost to the ceiling, taking the wall....

The road by the entrance at 4 is a shambles, and going down towards 5 has had a good deal of general scouring and depositing of big rocks....

At 5 water and debris came over between the compressors and the ventilation set up.... The tap at the end of the hose from the diesel oil tank up above was torn off and 400 gallons lost. The ventilation engine was buried in debris up to the starting handle....

The mine dump was all carried away practically back to the hard, leaving a section of tramline 4 or 5 rails long sagging in midair. There is a deep gulch below.⁵²

In late February, a committee appointed by the borough council to draw up conditions to be observed by Norpac should it be permitted to use ten acres of council land reported to the full council. Councillors were shown a plan of the site, 100 feet by 100 feet, cleared with Skidmore's approval, and agreed to several conditions. 'No water in the area or coming through or

⁵¹ A.F. Downer to F.J. Handcock, 22 March 1966, Norpac Papers held by Inspector of Mines, Box 17B, file X98, MC.

⁵² Alistair Isdale to Frank Handcock, 2 March 1966, Norpac Papers, Correspondence: Downer file, Union Hill.

from it' was to be 'polluted by tailings or like material', Norpac was to indemnify the council for any loss of water by riparian owners, solid tailings were to be deposited in consultation with the catchment board 'in such a manner so as not to be a nuisance or a danger', and once mining ceased the area was to be left 'in a clean and tidy condition'. The company was to be reminded that they would be operating within 'the Council's water catchment granted to it and protected by Special Act of Parliament' and was required to 'do everything possible to guard Council's rights in the area'.⁵³

On 5 April, the council and Handcock, Isdale, and Norpac's solicitor discussed, amongst other matters, the installation of septic tanks; Handcock stated that he would not employ more than 20 men.⁵⁴ The following month, Norpac applied for a license to mine in an area of 200 acres. On 26 May, the Minister of Mines and the council signed an agreement permitting 100 acres of borough land to be granted to Norpac, on specified terms and conditions. Norpac was not to

pollute or tend to pollute the water in any stream whether supplying the Te Aroha Borough Water Supply or not and will not cause or allow earth rock or minerals removed from any works carried on by the Licensee or any mining tailings debris or refuse to enter any such stream. All tailings or waste materials shall be deposited in such manner as not to be a nuisance or danger.

Adequate sanitation was to be provided. Should the Medical Officer of Health consider any of its operations were 'detrimental to the purity of the Te Aroha Borough Water Supply', these must cease until authorised to recommence. No more than 20 men were to be employed, there was to be no 'unnecessary damage' to the forest, and when work ceased Norpac was to remove 'all buildings and plant and leave the said land in a clear clean and tidy condition'.⁵⁵ The deputy mayor of the time recalled, 20 years later, that

⁵³ Report of Special Committee to meeting of Te Aroha Borough Council held on 21 February 1966, Te Aroha Borough Council Minutes 1965-1966, Sam Guernier Papers, Te Aroha.

⁵⁴ Minutes of conference held between Te Aroha Borough Council and Norpac representatives, 5 May 1966, Te Aroha Borough Council Minutes 1965-1966, Sam Guernier Papers, Te Aroha.

⁵⁵ Agreement of 26 May 1966 between the Minister of Mines and the Mayor Councillors and Citizens of the Borough of Te Aroha, Te Aroha Borough Council, A26/6/1, Matamata-Piako District Council Archives, Te Aroha.

the Borough was quite keen for Norpac to succeed in its approach to the Mines Department to work the Norpac Mine because this was going to be another industry in Te Aroha. My recollection is that after negotiations with the Mines Department the Te Aroha Borough got the agreement of 26 May 1966 and regarded it as all the protection it needed.⁵⁶

The Hauraki Catchment Board inspected the site, noting that the topography was 'generally steep to very steep' and that mining could potentially endanger the success of the new Waihou Valley Scheme of flood control. It wanted conditions requiring minimal disturbance of the vegetation, no discharge of 'mining wastes, tailings or debris' into 'any watercourse either directly or indirectly', and that the working area at No. 5 Level have a suitable culvert to enable the stream to flow without causing blockages or scouring. 'The precise location, height and extent' of rock dumps were to be such that would be no slips. Tailings pits should be so constructed and operated that no sudden or gradual discharge of tailings or tailings water into any stream would occur, and streams were not to enter the pits. When mining ceased, tailings were to be 'left in such condition that they cannot be carried by water or other natural forces into any watercourse'.⁵⁷ Handcock told Roger Harris, its chief engineer, that he appreciated the visit and their 'very patient interest and guidance', and provided copies of letters from Norpac's advisers who were working on the details.⁵⁸ One such adviser, after discussion with Dave Haszard, assayer and metallurgist for Norpac, was convinced that the system proposed 'would in no way present a pollution problem or hazard'. Reusing mill water taken from the pond after settling meant that there would be very little water to be discarded.⁵⁹ Thus assured of a trouble-free future, the hearing went ahead without controversy and the conditions requested by the catchment

⁵⁶ Statement by Donald K. McConnachie, 7 June 1985, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

⁵⁷ C.H. Walsh (Secretary, Hauraki Catchment Board) to Mining Registrar, 1 July 1966, Te Aroha Warden's Court, Mining Applications 1966, 8/1966, BCDG 11289/6a, ANZ-A.

⁵⁸ F.J. Handcock to R.W. Harris, 28 June 1966, HCB, Series 1, Box 205, File 7/2, vol. 1: Mining Applications: Te Aroha, WRC.

⁵⁹ M.H. Buckenham (Senior Lecturer in Mineral Technology, University of Otago) to F.J. Handcock, 3 June 1966, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

board were agreed to by the warden.⁶⁰ The borough council was so pleased at the prospect of a mine that it insisted, successfully, that the license be granted under a section of the Mining Act that would give the rental for the land to itself, not the Crown. It argued that although the mine was on Crown land, the battery and tailings sites were on borough land. As a result, the borough would gain £100 a year from each of the four sites to be taken up.⁶¹

On 1 September the company applied for special sites for their mill and treatment sites plus five acres for a tailings pond at Fern Flat. When the catchment board considered these applications at its meeting later that month, several members voiced concerns. The chairman, Reginald Seymour Bates, commented that, in a previous discussion with Handcock, 'it had been indicated that an area of two or three acres was required for the disposal of the tailings, but now they require a much larger area'. He was concerned at the amount of time the board's engineers had had to spend in investigating the applications, a point taken up by Harris: 'The previous application from the Company took a lot of my time in investigation work, which I don't think is my job'. Bates complained that there was no plan of how the tailings would be contained, commenting that it was 'completely wrong that our engineer should spend his time working out a plan for the Company'. Robert William Andrews also complained about the inadequate data provided: 'We don't know at what height the stop bank at the site will be or whether it could break and send a deluge down on us'. Harris warned that the mountain 'was prone to heavier rainfall and flash storms' than the township; for example, the new meteorological station on the mountain had, over a three-day period, recorded five and a half inches compared with 3.1 inches in the town.⁶² As a result of an unanimous vote, the secretary informed the mining registrar that the board

understood the residue from the treatment of the ore will be in the form of finely ground tailings. Board is disturbed at the possibility of large quantities of tailings being stacked on relatively steep slopes. The material is likely to be infertile and to be exposed to high intensity rainfall and there are serious doubts whether quite extensive wash (i.e. local erosion) over long periods

⁶⁰ Memorandum of 1 September 1966, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

⁶¹ Gilchrist Burns and Johnston to Minister of Mines, 2 May 1966, Mines Department, MD 1, 12/46/1038, held by Ministry of Commerce, Wellington.

⁶² *Te Aroha News*, 27 September 1966, p. 1.

can be prevented. With the existing claim, and the additional 15 acres concerned in the present applications, the area of general disturbance on steep mountain slopes is beginning to reach comparatively large proportions. The methods to be used in milling and treating the ore and disposing of the tailings is of prime importance and until Board is in possession of this information, in full, and its fears are allayed it must formally oppose the applications.⁶³

Harris sent a copy to Norpac with a covering letter stating that he had understood that their original application 'was the only claim needed' and that he was 'somewhat surprised and even alarmed, that a further 10 to 15 acres' was now required. Quite apart from the need to preserve the bush as part of the Waihou Valley Scheme, there was 'the long term water resource potential and the recreation function'. As the mountain was 'a recognized scenic area', there was 'little doubt that extensive dumps of tailings on the mountain side could be quite detrimental'. Before making any recommendations, he required 'satisfactory answers' to two questions:

(1) Why cannot the tailings be dumped elsewhere on flat ground away from the mountain?

This would minimise general disturbance, eliminate erosion hazards, and, on the face of things, seems to be by no means impossible, either physically or financially.

(2) Without implying any commitment or approval to such an operation, in the event that tailings were to be dumped on the mountainside, would you please submit full detailed proposals which would ensure that the Board's interests would be fully safeguarded.⁶⁴

Part of the alarm was caused by the board's belief that Norpac was seeking an additional area, when in fact its application related to the site already covered by their mineral license. Norpac's consulting engineer in pointing this out wrote that he was 'somewhat disturbed' by the report of its meeting, for it would receive full details of the pit and Norpac would abide by the conditions imposed. He suggested 'that in future should any information be required, either the Company or our firm be contacted

⁶³ C.H. Walsh to Mining Registrar, 28 September 1966, Te Aroha Warden's Court, Mining Applications 1966, 13/1966, BCDG 11289/6a, ANZ-A.

⁶⁴ R.W. Harris to Secretary, Norpac Mining Company, 28 September 1966, Te Aroha Warden's Court, Mining Applications 1966, 13/1966, BCDG 11289/6a, ANZ-A.

rather than that doubts should be expressed publicly and thus throwing the onus of justification on the Company'.⁶⁵

In consultation with Gensiro Sakai, senior metallurgist for the Matsui Mining and Smelting Company of Japan, and Hiromi Tarasawa, that company's liaison representative in Auckland, both of whom inspected the sites for the mill and tailings pond,⁶⁶ detailed plans and drawings were prepared by J. Bruce Wallace, a consulting engineer.⁶⁷ Handcock reported that Mitsui provided 'a good practical tailings dam design that will permit of early site preparation and construction'.⁶⁸

A toe bund of "pit soil" was to be constructed at the western boundary of the tailings disposal area, with a gravel filter mat on its upstream slope. Deposition of the tailings would then occur behind the bund and with time the dam height would be increased using the coarse fraction of the tailings while the fine fraction would be deposited nearer the decant points towards the eastern side of the area. As the height of the dam was increased the centreline of the crest would be shifted towards the pond area using what is termed the "upstream method" of construction.⁶⁹

The tailings site was granted on 22 December, with the conditions required by the board imposed, but applications for the other two special sites were abandoned by Handcock because 'eleventh hour conditions imposed by the Te Aroha Borough Council could not be met'.⁷⁰ To carry out the requirement to keep tailings out of all streams, Norpac decided 'to

⁶⁵ J. Bruce Wallace (of Robert James and Bruce Wallace and Partners) to Chairman, Hauraki Catchment Board, 4 October 1966, HCB, Series 1 Box 205, 7/2, vol. 1, WRC; Minutes of 9th Meeting of Directors held on 11 October 1966, Norpac Papers, Box 9, UA.

⁶⁶ F.J. Handcock, Report for period ending 31 August 1966, Norpac Papers, Box 5, NMC 19/2; Minutes of 8th Meeting of Directors held on 13 September 1966, Norpac Papers, Box 9, UA.

⁶⁷ F.J. Handcock, Report 2/2 for period ending 25 March 1967, Norpac Papers, Box 5, NMC 19/1, UA.

⁶⁸ F.J. Handcock, Report 11/1 for period ending 30 November 1966, Norpac Papers, Box 5, NMC 19/1, UA.

⁶⁹ Tonkin and Taylor, 'Stability Study of Norpac Mine Tailings Dam', May 1974, p. 2, HCB, Series 1, Box 206, 7/2, vol. 2, WRC. Plans of the original tailings pond and dam held in Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

⁷⁰ F.J. Handcock, Report 12/1 for period ending 31 December 1966, Norpac Papers, Box 5, NMC 19/1, UA.

install at the downstream toe of the dam at the outlet of the 10" diameter pipe a concrete pump chamber for which to pump all tailings water back to a head tank ... for re-use'. This water, along with water from the mine that was held in another tank, would be re-cycled within the milling operation. In additional, 'all wash water used at Mill will be discharged clear of tailings pond'.⁷¹

1967

When Roger Harris inspected the partly constructed earth dam on 27 January, what he saw confirmed his 'serious concern' that the small valley at Fern Flat had been dammed 'to an appreciable height, without any effective provision for safe overflow, in the event of heavy storm run-off'. He reminded the company that it had been agreed that the tailings pit should allow for an 'unrestricted flood-way for the small stream'. The work being done departed 'almost completely from this principle and the method, apparently, originally envisaged by your consultants', making the dam a potential hazard.⁷² This led to a visit to the site by Wallace, Harris, the chairman of the catchment board, and two board members, as a result of which Wallace agreed to Harris' request for improved piping of waste water and an emergency spillway.⁷³ Norpac also agreed to build an earth bank on the streamside.⁷⁴ Harris was mollified, as the plans were now 'reasonably in line with principles originally agreed upon', but he repeated that all dams must be completely safe, all natural streams, springs, and local run-off must be kept completely separate from mining operations, and floodways must be kept clear. Although the board required 'to be re-assured on various matters', the responsibility for ensuring that all requirements were adequately met lay 'entirely with the Company'.⁷⁵

⁷¹ F.J. Handcock to Gensiro Sakai (Assistance Manager, Mining and Geology Department, Matsui Mining and Smelting Co. Ltd, Tokyo), 9 December 1966, Norpac Papers, Mitsui file, Union Hill.

⁷² R.W. Harris to F.J. Handcock, 31 January 1969, HCB, Series 1, Box 205, 7/2 vol. 1, WRC.

⁷³ J.B. Wallace to F.J. Handcock, 20 February 1967, HCB, Series 1, Box 205, 7/2 vol. 1, WRC.

⁷⁴ F.J. Handcock, Report 2/2 for period ending 25 March 1967, Norpac Papers, Box 5, NMC 19/1, UA.

⁷⁵ R.W. Harris to Robert James and Bruce Wallace, 27 February 1967, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

To meet the board's requirements, changes were made, as explained in a 1974 report, which also described how the pond operated:

The tailings area was not initially developed over the total area, in order to allow spring and surface runoff water to pass around the northern limits of the area rather than enter the pond. Thus a breach was made at the northern end of the earth bund and a side bund was constructed to form the northern limits of the smaller pond area....

Initially the discharge water from the tailings pond was recycled through the mill. In order to make use of the area to the north of the side bund the spring and runoff water was collected in pipes and the main earth bund extended to the north. At this stage tailings deposition was diverted to the area to the north of the side bund and the tailings in the first area were allowed to dry out and desiccate. These dried tailings were then excavated using normal earthmoving plant and were deposited mainly on the downstream side of the clay bund at the western end of the area. Tailings were then deposited in the areas both north and south of the side bund. The main tailings dam was built up over a number of years by separating the coarse and fine fraction using "cyclones;" the fine fraction was allowed to deposit on the downstream slope. A rubber tyred loader was used to move the coarse fraction (sand) and spread it out to build up the dam, using its wheels to provide compaction. The dam was thus built up by what is known as the "centreline method," the bund being maintained approximately 5 feet above the tailings level.⁷⁶

McAra added that when the fine fraction went to the pond at the back of the dam, a siphon 'installed on solid country' removed the surplus liquid; it could handle 12 inches of rainfall in 24 hours, the 'fines' creating 'an impermeable cake'.⁷⁷

Although Harris had got his modifications to the pond, he remained concerned over possible future problems. He told the chairman that the board's responsibilities and powers over Norpac needed to be clarified. 'Rightly or wrongly' he understood that the license under the Mining Act meant that the company was 'not necessarily obliged to satisfy or reassure the Board on any particular points that might be raised'. As ways to protect the environment had not been worked out in advance, there must be

⁷⁶ Tonkin and Taylor, 'Stability Study of Norpac Mine Tailings Dam', May 1974, p. 2, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

⁷⁷ J.B. McAra, Report for August 1972, p. 7, Inspector of Mines, Monthly Reports 1972-1973, BACB 18604, A654/10b, ANZ-A.

‘acceptable assurances’ that Norpac took full technical responsibility for the design, construction, and continued safe operation of the pit. ‘Occasional site visits’ by his staff were ‘no substitute for this and should be discontinued in the absence of such “acceptable assurances”’. So far, he had received none about the details of construction: would the company adhere to agreements reached? ‘At least one incident has occurred involving a very considerable departure from the agreed layout of the tailings pit, (since rectified) which would appear to offer confirmation to the above’. He recommended that the board should publicly state that it accepted no responsibility at this stage. It ‘must, at the least, keep a general watch on the situation’ and make Norpac provide ‘acceptable assurances’.⁷⁸

Privately, the company grumbled about the cost of modifying their pit. Downer, writing to an overseas director to explain the need to spend more funds preparing the mine and mill to enable production to start in July, claimed that ‘some quite costly requirements of the Catchment Board in respect to the disposal of the tailings have largely accounted for the cash run down’.⁷⁹ In fact the dam was estimated to cost only £8,500 out of the estimated cost of £148,500 to bring the mine and mill into production.⁸⁰

That Norpac’s directors did not anticipate any environmental problems was indicated by a meeting of 15 May at which they discussed a letter from the Department of Health about possible air and water pollution. ‘It was arranged that the General Manager should reply in suitable terms pointing out that it was not anticipated that there would be any air pollution and precautions would be taken to minimise any possible nuisance’.⁸¹ But they did employ Dr Lionel Stanley Davis as a consultant to report on any contamination of the streams. Davis had formerly worked as a Medical Officer for the Health Department, including in the Paeroa district,⁸² specializing in effluent problems. The August meeting of directors was told that samples of water taken from the Tui Stream were being analysed ‘so

⁷⁸ R.W. Harris to Chairman, Hauraki Catchment Board, 18 April 1967, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

⁷⁹ A.F. Downer to Benjamin H. Swig, 14 February 1967, Norpac Papers, Box 4, NMC 31, UA.

⁸⁰ Memorandum entitled ‘Tui Mine: Appraisal of Position as at 1.1.67’, dated 14 February 1967, Norpac Papers, Box 4, NMC 31, UA.

⁸¹ Minutes of 15th Meeting of New Zealand Directors of 15 February 1967, Norpac Papers, Box 9, UA.

⁸² See paper on pollution in the Te Aroha Mining District.

that the Company would have an official record of the natural mineral content of the water and would be in a position to gauge the level of contamination caused by the mill, particularly in regard to lead content'.⁸³ When Davis visited the site on 1 August he was shown around by Handcock and Dave Haszard, the mill manager. Handcock explained his expectations of selling the sands: in a similar mill tailings were added to fertilisers because of the trace elements. Davis described the pond in detail:

Tailings disposal is into a tailings dam situated just below the mill at the head of the Omahu gully.... Discharge of the tailings is onto the internal surface of the lower bank of the dam structure and the deposit of material from the tailings will gradually build up this bank of the dam both internally so that the dam will be gradually reduced in area and also upwards above the present level of the dam structure so the depth of the [heap] will be increased. The dam will eventually be replaced by a mound of solid tailings.

Extending through this lower bank of the dam and along the floor of the dam upwards towards the mill is a nine inch concrete pipe drain with a four inch field tile drain along each side and these are also connected up with field tiles lining the whole internal face of this lower bank of the dam. It is hoped that any seepage from the dam will be caught up in these field tiles.

The nine inch concrete drain within the dam will have upright pipes perforated with 3 inch openings every six inches. As the tailings water in the dam settles the supernatant water after settlement of the settleable solids will be decanted through these openings into the nine inch drain. Lower openings in the pipe will be plugged as the settled tailings rise and so on up the pipe until the whole pipe is plugged when one higher up the dam will be brought into use. Water from the mine main drain and also the field tiles referred to will be caught up in a sump just below the dam and pumped back into the mill for reuse through a 2 inch rising main. The purpose of this [was] two fold. Firstly to recover the chemical reagents and secondly to comply with the requirements of the licence that no pollution of the streams shall take place.

Although emphasizing that he had been asked a question 'somewhat' out of his field, for he had no knowledge of the chemistry of the metals concerned, was not an engineer, and had no experience of disposal pits, Davis was confident, because of his 'long experience of assessing disposal

⁸³ Minutes of 17th Meeting of New Zealand Directors of 8 August 1967, Norpac Papers, Box 9, UA.

projects of all sorts and conditions of trade wastes', that the methods used would 'prove very satisfactory'. The dam was well constructed, 'the material being reasonably water proof', and the deposition of tailings would continuously strengthen it. Its capacity of 1,900,000 gallons was 'generous', and the 50,000 gallons to be used in the mill daily would never cause excessive hydraulic pressure. He expected that seepage through the floor of the dam would not be a problem, for ion exchange while passing through the clay would remove most if not all of the metals in solution before water reached the stream. If thought necessary, the Department of Scientific and Industrial Research could be consulted on the capacity of the clay to extract metals in this way. Unless there were accidents such as a breakdown of the pumps, 'fissure formation in the dam structure (unlikely)', or a burst pipeline there was little likelihood of any serious pollution of the Omahu Stream. 'Some pollution' of the Tui Stream was 'likely' because of 'the exposure of metal bearing ore to the leeching effect of rain, spillages, leaking glands etc in the mill' would inevitably pollute surface water draining into it. But as he thought that these metals were not very soluble in water, plus the small amount of such water compared with that of the stream, any serious pollution seemed 'unlikely'. The greatest hazard was lead, and he was 'concerned to learn' that the stream was used on the golf course to water the greens and in a dairy factory to wash floors. 'From experience' he knew that such water was 'frequently used for drinking'.

The first of his five recommendations was that, before the mill started, water samples taken from the Omahu and Tui streams should be tested for lead, copper and zinc. Once it started, samples should be taken at least monthly for the first year. As any pollution of these streams would 'for sure be blamed on the Company', it must be able to prove that the streams normally contained a certain amount of lead. Secondly, having checked the existing uses of the streams, the company might 'suggest or make available alternative water supplies, which was 'common practice'. Thirdly, the use of water for the golf course and the dairy factory needed to be addressed. 'In view of the possibility of pollution to a dangerous degree - I say possibly not probably or even likely - the matter becomes a serious one'. A rise in lead levels in the Tui Stream would require action (unspecified). Fourthly, controls and health tests should be set up to safeguard the workers' health

from lead poisoning. The last recommendation was to de-sludge the septic tank every 12 months: 'it will then be less likely to give rise to complaint'.⁸⁴

When sending this report to his directors, Handcock commented that examining workers for lead poisoning 'was impossible in NZ as miners had always resisted it'. He also reported that the local authorities had told him that the Tui and Tunakohoia streams were no longer used for the borough water supply but that one farmer watered his stock from them. Only a temporary stoppage of the water supply would cause the borough engineer to draw water from the Omaha Stream.⁸⁵

On 19 September, McAra visited the site at the request of Harris, who was concerned over possible pollution of the Tui Stream. McAra recorded that Harris thought it might 'be used for human consumption, not just for watering greens', a point that would have to be sorted out. He then called at the mine 'and found the arrangements for tailings disposal appeared satisfactory'.⁸⁶ On 22 September, at Harris' request McAra discussed the danger of erosion with Harris, Handcock, and Haszard. McAra recorded that

Harris was generally satisfied with the precautions taken, but pointed out that seepage or a spring which appears to be coming from beneath the downstream end of the tailings dam should be drawn to the notice of the dam consultants, as it might affect its security. Mr Handcock makes the point that seepage from the dam will probably be taken up by the deposit of slimes and I agree that this is most likely. However, it seems reasonable that the source of the water should be located.... After inspecting the plant Mr Harris remarked on the apparent importance of the undertaking.⁸⁷

Later that month, after receiving a complaint about pollution of the Tui Stream, McAra asked the Hamilton Medical Officer of Health to test the water. Chemical analysis of samples taken above the golf club intake

⁸⁴ Dr L.S. Davis, Report on Tailings Disposal: Norpac Mine Te Aroha, typescript, August 1967, Norpac Papers held by Inspector of Mines, Box 17B, TB 54 (=X98, file 3), MC.

⁸⁵ Memorandum by F.J. Handcock, 8 August 1967, Norpac Papers held by Inspector of Mines, Box 17B, TB 54 (=X98, file 3), MC.

⁸⁶ J.B. McAra, Report for September 1967, Inspector of Mines, Box 16B, 13/11/D, vol. 2, MC.

⁸⁷ J.B. McAra, Report for September 1967, Inspector of Mines, Box 16B, 13/11/D, vol. 2, MC.

revealed no copper, lead, or zinc, but bacteriological examination revealed 'heavy pollution', probably from sources other than the mine. The Medical Officer suggested only one main condition be applied: 'adequate provision be made to prevent the escape of any poisonous wastes or other deleterious materials into any watercourse'. A copy of this test was sent to the catchment board.⁸⁸

Norpac was regularly in touch with its Japanese advisers about the best machines and techniques to use in its mill. When seeking advice on the best reagent to use, it is clear from Handcock's letter in June that he was conscious that there were environmental limitations on what he could use: 'For reasons of the Catchment and River Control Board's requirements, we would not wish to use sodium cyanide'.⁸⁹

1968

At the beginning of this year the height of the tailings dam was increased and the total area planned to hold the initial tailings was being used.⁹⁰ But the company's optimism that pollution would not be a problem would soon prove to be unfounded, and during the year it became of increasing concern to the local authorities. In April 1969, Ian Edward Feasey, Health and Buildings Inspector for the Te Aroha Borough Council, listed all the pollution that had occurred from April 1968 till then. The first time that he had been informed of pollution was in April, then on 18 and 19 October discolouration of the stream was again noticed, causing him to inspect the dam, as detailed below. More discolouration occurred on 11 November, and two days later 'frothing agent in stream adjacent to dam' was reported by him to the mine management.⁹¹

On 9 August, Peter John Carter, appointed office manager after Isdale left the company's employment in December 1966, noted:

⁸⁸ D.J. Joll (for Medical Officer of Health, Hamilton) to J.B. McAra, 22 December 1967, Te Aroha Warden's Court, Mining Applications 1968, 5/1968, BCDG 11289/6a, ANZ-A; copy in HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

⁸⁹ F.J. Handcock to Gensiro Sakai, 4 June 1967, Norpac Papers, Mitsui file, Union Hill.

⁹⁰ F.J. Handcock, Report 2/3 for period ending 24 February 1968, Norpac Papers, Box 5, NMC 19/3, UA.

⁹¹ Memorandum by I.E. Feasey, 16 April 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

Visit from a Mr McMillan, interested in buying our entire production of quartz chips. Phone call from Richardson, who had visited us a year ago, regarding the sale of sand. McMillan to take a lorry load of samples and submit a firm offer in writing soonest. McMillan to visit tailings dam in the near future.⁹²

On 15 August Wallace, still Norpac's consulting engineer, accompanied Downer to examine the mine tips and 'to examine tailings sand proposals',⁹³ but this possibility of selling the tailings did not proceed.

Engineers had been asked for advice on how to deal with the tailings. A Cable Price Downer engineer, noting that 100 tons were produced each day, warned that the existing dam would be too small by the end of the year. The earlier idea of piping the tailings away was impractical, for the sands were 'highly abrasive being predominantly silica and any flume or pipe carrying the tailings' was 'quickly abraded'. He recommended that around 1,000 tons of 'good white sand' (the plus 300 mesh material) be stockpiled and sold. Slimes would need an area of three acres, to be covered to a depth of nine feet.⁹⁴ Norpac's consulting engineers again inspected the site, and warned that rainwater draining from the road onto the pit was creating the 'possibility of water topping the dam'.⁹⁵ In September they gave a more detailed report of their investigations. The useable area, although 'not as large as was thought before the lines were cut through the scrub', provided approximately 0.4 acres for the two pits and a practical depth of ten feet (180,000 cubic feet storage). The area by the cattle stop also seemed smaller than envisaged. The combined areas would not be sufficient 'for continually storing the fines'.

We are looking into the possibility of finding a market for the fines and with this in view we are having an analysis carried out. Should there be a sale new pits at Fern Flat could be used for de-watering and temporary storage only.

⁹² P.J. Carter, Daily Diary during F.J. H[andcock]'s Absence, August - 1968 (typescript), 9 August 1968, Norpac Papers, loose material, Union Hill.

⁹³ P.J. Carter, Daily Diary during F.J. H[andcock]'s Absence, August - 1968 (typescript), 15 August 1968, Norpac Papers, loose material, Union Hill.

⁹⁴ W.W. Jenson (Plant Engineer, Cable Price Downer, Wellington) to Norpac, 13 August 1968, Norpac Papers, Wallace HCB file, Union Hill.

⁹⁵ J.B. Wallace (of Robert James and Bruce Wallace and Partners, Consulting Engineers) to A.F. Downer, 27 August 1968, Norpac Papers, Wallace HCB file, Union Hill.

Should there be no market we are of the opinion that the fines should be piped to some convenient piece of land at the foot of the mountain and held safely for all time in an earth dam.⁹⁶

Handcock's report to his directors written on 15 October detailing all aspects of the mining operation included some references to pollution issues. Despite earlier not wishing the use cyanide, from 23 September it was being used in the lead copper conditioner, and as an improvement in the concentrate was immediately evident it would be used in all future treatment. As it was now 'very urgent' to increase the size of the tailings area, a scheme to alter the method of their disposal had been worked out. This provided for the continued rise in height of the presently used area. The enlargement of it 'by provision of piped drainage (of small creek and springs)' would double the available storage area.

A tailings thickener and filter will dewater tailings to approx 12 to 15 percent moisture. All water will return to mill head tank and all dewatered tailings will be dry stacked. The proposal has been submitted to the Catchment Board and we await approval before proceeding to construction.⁹⁷

Harris was advised by Wallace that, under this system, once the mine closed 'a channel of clay and loam' could be formed over the surface of the tailings which would 'give a permanent water way for the rainfall from the small catchment'. It was 'not uncommon overseas for tailings pits to be spread with soil and crops grown thereon'.⁹⁸ This scheme was being examined by the Mitsui Mining Company, which provided advice on all aspects of the treatment of ore, and no action would be taken until costs were known.⁹⁹ It was put forward at a time when the local bodies were increasingly aware that the mine was causing pollution. A memorandum by Feasey written in late October (a copy being given to the catchment board)

⁹⁶ J.B. Wallace to Norpac, 23 September 1968, Norpac Papers, Wallace HCB file, Union Hill.

⁹⁷ F.J. Handcock, Report 10/3 for period ending 5 October 1968, Norpac Papers, Box 4, NMC 19/3, UA.

⁹⁸ J.B. Wallace to R.W. Harris, 17 October 1968, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

⁹⁹ A.F. Downer to Melvin Swig [a Norpac director, resident in San Francisco], 23 October 1968, Norpac Papers, North American Partners file, Union Hill.

vividly revealed the pollution issues and the problems he would have in getting compliance:

During the past few months I have received a number of complaints about the discolouration and taste of the water from Members of the Golf Club and occupiers of the dwellings which use water from the supply point situated on the Tui Stream.... Norpac Mines Ltd ... have been periodically polluting this stream with water from the "tailings pond."

Until Friday the 18th of October, I had not seen any evidence of pollution in the stream. Previous to this date I had made a number of visits to the point where the stream meets the main highway by the Golf Course.

I received many phone calls [on] the Friday and later that day I took a sample of the water from the stream. This sample has been sent away to be analysed for evidence of pollution. Later that day I called on the Manager of the Mine Extraction Plant and discussed the stream pollution problem. He stated that during the night the hose from the mine extraction plant to the pond had broken and the water had found its way into the stream. This hose had been fixed during that morning and was functioning satisfactorily at the time of my visit. I did not see any evidence of water flowing over the dam wall at the time of my visit.

During the discussion with the Mine Plant manager, the comment was passed by the manager, that sooner or later this problem must come to a head and mentioned further that his company was trying to avoid pollution of the stream. I explained to him that I was particularly concerned because the stream was used as a domestic water supply.

On Monday morning I was informed of further discolouration of the stream. This was confirmed by my inspection during the morning. Early in the afternoon together with the Ohinemuri County Health Inspector we went up to the mine plant to further investigate the pollution problem. I met the company's chemist at the mine and mentioned that we intended to investigate the source of discolouration. While returning to the dam I noticed a 2 inch alkathene pipe draped over the wall of the dam near the back of the dam.

As we proceeded around the top of the dam to the point in question a member of the staff came down from the factory and removed the pipe from the dam, then returned to the factory. This pipe was syphoning water out of the dam into the stream. This was direct pollution of the stream with full knowledge of the mine staff.

When we arrived at the point of pollution the stream above this point was slightly discoloured and a clay brown in colour. Below the point of pollution the stream was grey in colour and there was a large amount of settled sand of the same colour as the tailings

from the plant. The water below this point was frothy and showed ample evidence of being polluted with a frothing agent.

While returning to town we met the Manager of the company.... During subsequent discussion I reiterated the fact that I was very concerned about the pollution of the stream and emphasized that the water was used for domestic purposes. The manager expressed surprise at this statement and maintained that he was not aware that anyone used the water for domestic purposes. I informed him what we had noted at the mine tailing pond and he appeared to know these facts. I requested his assurance that no further pollution of the stream be permitted. He gave me this assurance. I also requested that efforts be made to solve this problem between the parties as soon as possible.

Later I wrote a letter to the Manager and to the Golf Club with respect to this matter.¹⁰⁰

Feasey's brief letter to Hancock did not describe what he had seen but simply reminded him that the license to mine required that there be no pollution. As the company had polluted the stream 'on not less than two separate occasions', he required Hancock to take 'all steps necessary' to prevent further pollution. Should any pollution occur or be likely to occur, his office must be told so that those using the stream could be warned.¹⁰¹

Hancock's report to his directors stated that the pipe between the mill and the tailings pond had broken early in the morning of 18 October and that when this was noticed at 7.30 a.m. the mill was stopped and replacement pipes fitted. Before this was done, tailings had entered the Tui Stream. He reported that Feasey was worried, and that although the golf club had put the matter in their solicitor's hands no legal action had been taken. There was a 'minimal' area available for storage, and the 'water settling area and depth adjacent to tailings return water decant pipe' was 'so restricted as to make efficient settling difficult'. Early approval for an extension of the pond was needed, and he was working out the details with the catchment board.¹⁰²

¹⁰⁰ I.E. Feasey, 'Memorandum: Water Supply from Tui Stream', n.d. [c. 24 October 1968], Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha; copy in HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

¹⁰¹ I.E. Feasey to F.J. Hancock, 23 October 1968, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha; copy in HCB, Series 1, Box 295, 7/2 vol. 1, WRC.

¹⁰² F.J. Hancock, Report 11/3 for period ending 2 November 1968, Norpac Papers, Box 5, NMC 19/3, UA.

Handcock's response to Feasey's letter was to repeat that the pollution on 23 October 'was entirely involuntary on my company's part and was caused by circumstances beyond its control'. The pollution in April was the result of exceptional rainfall causing a washout in the dam: 'The damage was repaired by the company forthwith and no further trouble has been experienced from the dam'. He was not attempting to evade responsibility, Norpac was fully aware of its obligations, and he could 'confidently' say that since the inception of processing it had 'been assiduously careful in its endeavours to avoid any pollution or other nuisance'. He was instructed to assure Feasey that the company would 'do everything in its power' to prevent pollution, would rectify it should any occur, and would notify him immediately of any accidental pollution. Subject to obtaining catchment board consent, Norpac proposed to increase the capacity of its pond and install a thickener and filter plant, at an estimated cost of some \$50,000. This scheme would prove Norpac's *bona fides* because it would 'virtually eliminate any possibility of further pollution', all liquids being 'recovered and re-used in the company's mill'.¹⁰³

On 14 November the Government Analyst reported that a sample of the Tui Stream taken above the golf course had disclosed a lead content of 0.08 parts per million, above the maximum of 0.05 ppm allowable by the World Health Organisation, which meant the water should be rejected 'as a public supply for domestic use'.¹⁰⁴ After discussions between Handcock, Skidmore, and White, Norpac agreed to meet the cost of piping water from the borough water supply to the golf club, the Te Aroha Dairy Company, and others. In return, Norpac wanted an assurance that if it sought more mining privileges that affected this stream, the council would support it. This agreement was to be communicated forthwith to the catchment board, for reasons Handcock explained to White:

You will be aware of the position that Norpac Mining Limited is faced with an urgent problem connected with its tailings and has submitted a major scheme for approval of the Hauraki Catchment Board. Unless this scheme is implemented immediately Norpac Mining Limited is faced with the closure of its operations. There

¹⁰³ F.J. Handcock to I.E. Feasey, 4 November 1968, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹⁰⁴ O.H. Keys (Government Analyst) to Medical Officer of Health, Hamilton, 14 November 1968, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

is no need for me to detail the disastrous impact closure will have on my Company and its employees.

I take this opportunity to record the courtesy and consideration extended by your Mayor and yourself and look forward to your early answer.¹⁰⁵

No doubt the discussions had included the impact on the local economy of Norpac's closure, although this was not raised when the council debated the issue that evening and agreed to require Norpac to meet the cost of the temporary water supply to those affected. When White informed Handcock of this, he did not mention Handcock's conditions, and as a result no agreement was reached.¹⁰⁶ Indeed Handcock withdrew the offer of meeting the installation costs when he received details of the analysis of the water sample taken at the golf club, which he claimed showed the water was within World Health Organisation standards. He told White that, as Norpac had not been 'advised officially that pollution had taken place ... the use of "Stream Pollution" as a letter subject heading' was 'in error'.¹⁰⁷

Negotiations between Norpac and the catchment board over the proposal had begun after the board visited the site on 7 November and discussing the issue with representatives of Norpac and their consulting engineers. Afterwards, Handcock assured the chairman that he appreciated their visit and trusted that it 'did fully illustrate the proposal and our urgency in seeking a favourable decision, so permitting us to proceed to construction'. He added that another of the advantages of dry storage was that it would 'enhance the storage volume on the area and provides for ready access to transport to cart away sand'.¹⁰⁸ McCara, who had visited the mine at Harris' request on the same date, examined the proposed works and discussed them with the consulting engineer. He reported that they were 'well planned and reasonable to meet the situation', adding that the

¹⁰⁵ F.J. Handcock to Town Clerk, Te Aroha, 19 November 1968, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹⁰⁶ *Te Aroha News*, 21 November 1968, p. 1; Town Clerk to F.J. Handcock, 20 November 1968, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha; F.J. Handcock, Report 12/3 for period ending 30 November 1968, Norpac Papers, Box 5, NMC 19/3, UA.

¹⁰⁷ F.J. Handcock to Town Clerk, 4 December 1968, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹⁰⁸ F.J. Handcock to Chairman, Hauraki Catchment Board, 11 November 1968, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

question of existing water rights was 'obscure and it was felt that it would be better if any rights on the Tui stream were cancelled or transferred' to the Tunakohoia.¹⁰⁹

Norpac's advisers recorded that the 7 November meeting discussed technical points concerning drainage and pollution: 'No recorded objections were noted to the proposed scheme'.¹¹⁰ However, silence did not yet mean consent. Harris reported at a meeting of the catchment board held on 20 November that although Norpac had kept tailings out of the stream, 'it had apparently not been able to keep the stream free from pollution', for Feasey's tests had revealed a 'certain amount of lead'. After discussing Norpac's plans for the new tailings system, it decided to reach agreement with the council on pollution and then to deal with the application.¹¹¹ Accordingly, a meeting was held on 25 November between representatives of the board, the council, and the Ohinemuri County Council. Feasey raised the issue of lead in the Tui Stream, and Harris expressed fears of a dam failure. It was accepted that cost ruled out dumping the tailings elsewhere. Harris then asked if the councils wished to see the details of the agreement the board was working out with Norpac, or whether they would be satisfied to know that it would insist on 'all possible precautions'. He stressed that the board 'could not decline the application for a reasonable system' without 'good reasons'. The Ohinemuri representative, who wanted Norpac to keep operating, responded that his council was content to leave the board to work out an agreement. Harris said that, while he was satisfied with the consulting engineers' plans, there could be no guarantee that the tailings would be safe, and their commercial use was questionable because their chemical composition might 'make them unsuitable for some particular uses (e.g. concrete)'. All agreed that Norpac must not pollute the stream, even if the borough no longer used it for their water supply.¹¹²

¹⁰⁹ J.B. McAra, Report for November 1968, Inspector of Mines, Box 16B, 13/11/D, vol. 2, MC.

¹¹⁰ P.B. Clark (of James and Wallace), 'Notes of Meeting of the Hauraki Catchment Board, Robert James and Bruce Wallace and Partners and Norpac Mining Ltd.', 7 November 1968, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

¹¹¹ Minutes of the Ordinary Meeting of the Hauraki Catchment Board of 20 November 1968, HCB, Minute Books, vol. 14, p. 112, WRC.

¹¹² Meeting between Hauraki Catchment Board Representatives with representatives of Te Aroha Borough Council and Ohinemuri County Council, 25 November 1968, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

At a meeting held four days later between the board, Norpac, and McAra, Handcock presented a letter stating that it would take some time to reach agreement:

Unfortunately certain requirements must be met forthwith to avoid some possible pollution of the Tui Stream, and also to avoid closing down of the Mill.

This work will be limited to meet the immediate urgency, and still be a part of the final installation. It will consist of placing approximately 200 feet of 18" pipe in the location discussed between Mr Harris and Mr Bruce Wallace, and the extension of the clay embankment, to its original location. This will permit the safe containment of the Mill waste until such time as the proposed new installation is completed.¹¹³

Handcock once more explained the proposed system, adding that as the moisture content would be only eight percent the sands could be used in road filling or cement; 'it was possible that large quantities' of the 100,000 cubic yards would be removed. In response to the board's worries about pollution and the collapse of the dam because of the weight of the 'enormous dump', Handcock said that rainfall would only saturate the top three to four feet and would drain away quickly. McAra 'was satisfied that (1) the heap would not create any problems as feared & (2) that there would be no pollution'. The reagents to be used were not toxic, apart from the cyanide, but so little of that would be used that it would be 'virtually undetectable'. After discussing ways of strengthening the dam and piping flood waters, the board's representatives agreed to the proposal, on condition that a registered civil engineer assured them that the design and construction of the dam and related works were satisfactory.¹¹⁴

McAra's report on this meeting stated that he attended at Harris' request, and that

after receiving complaints from Norpac Mining Ltd. that in spite of all their efforts to meet all reasonable demands from the Engineer of the Hauraki Catchment Board and the undertaking

¹¹³ F.J. Handcock to Secretary, Hauraki Catchment Board, 29 November 1968, Mines Department, MD 1, 12/46/1038, Ministry of Commerce, Wellington.

¹¹⁴ Notes on a meeting held on 29 November 1968 between Norpac representatives, the Inspector of Mines, and the Hauraki Catchment Board, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

submitted to cost \$50,000, the Engineer wanted a number of new conditions....

There was lengthy argument between the parties, Mr Handcock advising at one stage that he would have no option but to close the mine if agreement could not be reached. At my suggestion a basis for discussion was established by the submission of a formula by the Engineer and eventually a satisfactory arrangement was reached.

My feeling was that the Engineer was far too non-committal and was not prepared to state specific requirements or to approve or condemn proposals submitted.

I had previously spoken to the Medical Officer of Health by phone when he advised that the stream in question was not an authorised water supply and was unsatisfactory in any case from a bacteriological point of view. He also advised that the lead content was well below the harmful limit.

It seemed to me that the question was one of possible pollution from erosion.

I assured the Chairman that if the tailing was dry stacked after the filter as proposed it would not collapse due to saturation as it would be sufficiently porous to allow the water to escape. I also assured him that the level of chemical reagents in the tailing could not reach a dangerous level as they were destroyed by reaction and dilution.¹¹⁵

In sending McAra a summary of the agreement between Norpac and the board, Handcock wrote that the company was 'appreciative of the discussion time and spirit of co-operation manifested'.¹¹⁶

If Handcock believed this 'spirit of co-operation' included Harris, he was mistaken, for Harris stressed the implications of Norpac's plans in a confidential memorandum written immediately afterwards. Several years of dumping tailings were envisaged, which meant the filling of the small valley with from 100,000 to 200,000 cubic yards of material with a dump face 30 or 40 feet high. Since Norpac had been granted its mining license, the Water and Soil Conservation Act had been passed in 1967; under this all catchment boards became Regional Water Boards as well. The board therefore had new responsibilities for stream pollution, and must not permit Norpac to increase this. At the same time, it was not 'in any position to

¹¹⁵ J.B. McAra to Chief Inspector of Quarries, 2 December 1968, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

¹¹⁶ F.J. Handcock to J.B. McAra, 3 December 1968, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

assume liability for any risks that might be involved, either concerning pollution, erosion, etc'. As the tailings were on a 'particularly steep mountain with a reputation for very high intensity storms' and some springs were not 'likely to be tapped', there was the likelihood of 'fretting at the lower end'. As part of the heap could 'become sufficiently saturated to threaten stability', the dam wall must be strong, possibly constructed from a series of stone gabions. It was 'not possible to assess the risk, or otherwise', of leaching: only 'actual experience' would determine if this would be 'minimal or non-existent'. He recommended that the board impose a 'continuing condition' that Norpac had 'no mandate to pollute the stream', and that, should pollution occur, the company must eliminate this, even if that meant abandoning their method of disposal. After first checking with other competent authorities such as the Medical Officer of Health, 'this should be made very clear to the Company'.¹¹⁷ On the immediate issue, Harris with the backing of his board confirmed with Norpac's consulting engineers that the changes proposed for piping the stream and building over-flow floodway and retaining structures could proceed.¹¹⁸

Pentland, now a Norpac director, regularly advised the company on technical points. In late November he wrote to Downer that he had gone over the information Mitsui had provided about a revised tailings scheme:

I still think it is a shame that a new and struggling industry should be saddled with such heavy costs just to satisfy the egoism of a few nincompoops. I can see no reason why the proposed set-up will not do what it is designed for. However, it is not an open sesame to trouble-free operation. There is still the danger that the de-watered tailings may be washed down the hill by a flash flood, and you may find that there is a build-up of chemicals, resulting in troubles in the flotation plant, because of using the water over and over again.

I have heard stories that there may be a demand for the coarser part of the tailing for road material or other uses. If this is true, it may pay to make two products, one coarse and the other fine.

¹¹⁷ R.W. Harris, 'Norpac Mining Ltd Tailings Pit', confidential memorandum to Hauraki Catchment Board, 29 November 1968, HCB, Series 2, Box 33, Te Aroha General VIS4-5, vol. 4, WRC.

¹¹⁸ R.W. Harris to James and Wallace, Norpac, and the Warden, 6 December 1968, HCB, Series 1, Box 205, 7/2, vol. 1; Minutes of the Ordinary Meeting of the Hauraki Catchment Board of 11 December 1968, HCB, Minutes Books, vol. 14, p. 135; J. Cookson (Chairman, Executive Committee) to Chairman of HCB, HCB, Minute Books, vol. 14, p. 151, WRC.

Even if you gave the coarse part away for hauling it down the hill, there would be some advantage because it would be that much less to store.¹¹⁹

At the foot of this letter, Downer noted, for the information of a fellow director, that after talking the matter over with Pentland, it was agreed that the latter would come to New Zealand

so that we can get all of one mind on the problem and the way to progress ahead. His reactions are of course those of all of us, but the fact the industry is struggling doesn't help us - could go in reverse.

The fact is that whilst the original plan was altered by the Catchment Bd. we did not ... drain the springs (most of our problem). The tonnage of tailings is about 6 1/2 tons per ton of concentrate, originally estimated at 4; so we were rapidly running out of space. The life of the mines could be many years, so we are forced to do something now, which, even with our original plan working, we would be doing in 12 month's time. I have asked Frank to prepare a report.¹²⁰

Handcock's continuing battle with the 'nincompoops' was mentioned in his report on the period to 30 November:

We have continued almost a day to day running skirmish aided by our Consulting Engineer and Solicitor, to get a decision. At a meeting held at the Hauraki Catchment Board offices on November 29th, it was resolved that the following "Heads of Agreement" applied:-

(1) Dry tailings disposal system is acceptable.

(2) Drawings and supporting James/Wallace letter of October 17th, 1968, is accepted with the additional requirement that a gabion structure be placed downstream.

(3) All detail design be accepted on James & Wallace certificates.

There is marked confusion in the minds of all interested parties, as to the functions of the various acts and ordinances that govern mining water added to this, the extraordinary indecision of the Hauraki Catchment Board, and we have an expensive and time consuming delay.

¹¹⁹ Art Pentland to Arnold Downer, 26 November 1968, Norpac Papers, North American Partners file, Union Hill.

¹²⁰ Memorandum by A.G. Downer to 'Nelson' [Duder], n.d. [December 1968], Norpac Papers, North American Partners file, Union Hill.

The board was permitting them to pipe the stream at the pond, but there were several requirements which he and his colleagues did not want to accept. As 'it would not be politic in our view to open these points to local discussion', a case should be put to the Warden when they sought an additional five-acre special site license.

With early completion of concrete pipe laying in stream bed and drainage of springs area which can now proceed along with restoration of clay bank dam continuity of milling is assured. During the Christmas shutdown of mill we will endeavour, by dozing of existing tailings dump, to reform the available area (to such depth as permitted after decanting all water) to provide a minimum of six months tailings storage volume.¹²¹

The first step in negotiations was a meeting on 4 December between Handcock, Wallace, McAra, Paul Augustine Carroll (Norpac's solicitor), and the board at which Handcock explained the new plans. The possible height of the pond would be 40 feet, the moisture content being eight percent. He would be happy for the tailings to be taken away for use in concrete or other purposes. Board members worried about heavy rain leading to the dam slumping and the tailings sliding down the mountain, as well as pollution caused by the spring underneath the pond. Norpac's response was that rain would make only the top layer wet, and it could be quickly drained; they did not expect any slumping. Norpac quoted McAra as being satisfied there would be no slumping and no pollution, which he did not deny. As for pollution from the reagents used in treatment, these tended to be neutralized as they reacted to extract the minerals and 'generally' were non-toxic, with the exception of cyanide, which would be used in extremely small amounts. The meeting concluded with the board suggesting improved ways of strengthening the dam.¹²²

When the board and others concerned with the problem visited the site three days later, Handcock told them that the company did 'not accept responsibility beyond the requirement of the Mining Act'. It would 'not undertake to arrest seepage and run off from rainfall'. In his record of this

¹²¹ F.J. Handcock, Report 12/3 for period ending 30 November 1968, Norpac Papers, Box 5, NMC19/3, UA.

¹²² Meeting held at Hauraki Catchment Board, 4 December 1968, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

visit, he claimed the board was impressed with the site and had approved the plans to improve it. 'McAra pointed out that it was a well thought out scheme providing improved control of tailings'.¹²³

On 10 December, Handcock formally sought the council's approval to extend the storage capacity and applied to the Warden two days later for a special site for extra tailings. He explained to the council that dry storage would be an improvement on the existing wet pond system:

Tailings in the wet form as discharged from the present mill building will be cycloned, overflow going to a thickener will be pumped back to mill head water tank, underflow will join cyclone feed to filter.

Filter discharge will be a damp, fine sand product which will stack. Presently used wet pit will on its northern side be provided with concrete pipe drain to carry spring water down stream clear of storage area. Downstream toe of storage area will be protected by a gabion structure.¹²⁴

Four days later, Pentland attended a meeting of Norpac directors that was informed that the present pond could only be used for another six months and that the delivery and installation of dry tailings equipment would take that time. Accordingly, they ordered the dry treatment plant designed by Mitsui.¹²⁵

McAra arranged to meet with Harris to 'iron out any problems' so that there would be no delay in having the necessary reports written for the Warden's Court meeting in January.¹²⁶ He found Harris

inclined to procrastinate and I suggested that as the matters connected with the application had already been fully discussed in my presence at a meeting of the Board he should be able to let

¹²³ Memorandum by F.J. Handcock, 7 December 1968, Norpac Papers, Wallace HCB file, Union Hill; F.J. Handcock to Town Clerk, 10 December 1968, Te Aroha Borough Council, A/26/6/1. Matamata-Piako District Council Archives, Te Aroha.

¹²⁴ F.J. Handcock to Town Clerk, 10 December 1968, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹²⁵ Minutes of 21st Meeting of Directors of 14 December 1968, Norpac Papers, Box 9, UA.

¹²⁶ J.B. McAra to L.S. Jones, 19 December 1968, Inspector of Mines, Box 16C, 13/11/F, vol. 1, MC.

the Registrar have a report at short notice. He could not promise but undertook to forward the report as soon as possible.¹²⁷

As the pond was completely full by 20 December, the mill was closed and over the holiday period diversion pipes for the springs were completed so that the flow was clear of the downstream toe of the dam. The height of the main dam and its wing wall was raised, and in January 1969 the No. 2 tailings area was first used. Handcock reported that it would give sufficient storage for over 12 month's operation, providing 'a period sufficient in which to extract the maximum of sand from Area 1'.¹²⁸

1969

Pollution of the Tui Stream during 1969 led to increasingly bad relations between Norpac and the local bodies attempting to control its impact on the environment. The year started badly: Feasey in an April memorandum recorded the first problem as occurring on 15 January, when the dam bank gave way because of rain. Discolouration of the stream was noted from 24 to 27 January: 'Stream discoloured grey residue on 17th green [of golf links]. Tailings pipe broken. Management notified'. Discolouration was again noticed on 16 and 17 February and 26 March, when a sample was taken from a house in Tui Road.¹²⁹

The hearing of the application for a special site to handle the ever-growing pond was held on 22 January at the mill site, immediately in front of the concentrate storage area and overlooking the tailings. In his report to the warden, McAra made his sympathies with Norpac clear in his explanation of the present system and of future possibilities:

The tailings which have the consistency of fine sand quickly settle in the dam and the solution which contains minor and non-injurious amounts of chemicals is pumped back into the mill to be made up to the required strength for treating the ore so that

¹²⁷ J.B. McAra, Report, n.d., on visit to Te Aroha on 20 December 1968, Inspector of Mines, Box 16B, 13/11/D, vol. 2, MC.

¹²⁸ F.J. Handcock, Report 1/4 for period ending 25 January 1969, Norpac Papers, Box 5, NMC 19/4; F.J. Handcock, Annual Report on Operations at Mine and Mill, Te Aroha, for year ending 31 March 1969, Norpac Papers, Box 4, NMC 30, UA.

¹²⁹ I.E. Feasey, Memorandum of 16 April 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

there is no discharge of any solutions from the mill into any water course, all these being recirculated constantly.

The dam into which the tailings are discharged consists of compacted clay provided with drainage and provision for by-passing any flow of stormwater which may occur in the 4 acre catchment above the mill.

It is common practice in mining overseas to discharge mill tailings into large stacks by pumping, constantly building up the outer edge from the material deposited. Some of these stacks cover many acres in some mining areas and may reach a height of over 100ft and are sometimes a major feature of the landscape. As a rule they are very stable and difficult to shift and tend to set and become hard while still remaining permeable. I consider that only by a rare accident would the discharge of tailings into the Tui Stream occur.

I understand that tests of the water in this stream have shown that there is no dangerous concentration of lead or chemicals in it but that the water is not satisfactory for human consumption from a bacteriological point of view and that this condition probably existed before the mill was built.

I understand that this stream is not an authorised water supply.

I understand that the Company is considering the installation of dewatering plant at considerable expense to extract the water from the tailings before it is discharged into the tailings dump by a belt conveyor when it would be in a condition like damp fine sand containing about two percent of moisture.

I am of the opinion that the Company has made every effort in the past to comply with the provisions of the Mining Act and has done so in all important respects.

I have not received any official complains regarding either pollution of any water supply or danger of erosion resulting from their activities although I have been told of pollution of the water supply to the Te Aroha Golf Club which urged me to secure the report mentioned from the Department of Health.

In the circumstances it seems rather unfair that the Company should be asked to carry out, in addition to the requirements under the Mining Act which already provide for the prevention of erosion and pollution, additional cost measures of a purely preventive nature based on the opinions of persons unconnected with the mining industry and I believe it would be better if interested local authorities could request action by the Mines Department in the event of their considering that danger of pollution or erosion existed rather than to seek to apply restrictive measures individually which have the effect of seriously hampering mining operations.

It would thus appear that the restrictive conditions applied by the Hauraki Catchment Board to the original Special Site Licenses should be omitted from the one now applied for.¹³⁰

McAra enclosed the report he had received in December 1967 that had revealed no pollution of the Tui Stream by mining. Noting the dispute over the adequacy of prevention measures between Norpac and the catchment board, he commented that Norpac's position had been 'rendered difficult' by 'the multiplicity of authorities involved', and recommended that the license be issued under the Mining Act of 1926. This would mean that conditions would be administered by the Inspector of Mines, 'thus avoiding the difficulty and confusion of multiple control'.¹³¹

Explaining the reasons behind his report, McAra told the under-secretary that the board's conditions were 'far too restrictive', and detailed his view on erosion and pollution:

Erosion:

The stream concerned is a small one about a mile in length which discharges into the Waihou River which carries such large quantities of silt from the active erosion of many square miles of pumice country at its headwaters that the normal erosion of a small tailings dump resulting from production of 30,000 tons per year must be insignificant. The catchment above the tailings is only 4 acres so that it should be safe and easy to construct a by-pass trench to carry any stormwater round the tailings dump, in which case it can only then be eroded by rain falling on it or springs underneath it.

These matters are simply and easily attended to by proper drainage and do not, in my opinion, require expensive structures such as have been suggested by the Board's Engineer.

Pollution:

In the first place this stream is not an authorised water supply ... and the water should be boiled, and in the second place there is no injurious concentration of chemicals or minerals in the tailings. Cyanide content has been tested by Mr Haszard giving a

¹³⁰ J.B. McAra, 'Memorandum re Norpac Mining Ltd.: Application for a Special Site: Hearing 22/1/69, Te Aroha', n.d., Te Aroha Warden's Court, Mining Applications 1968, 5/1968, BCDG 11289/6a, ANZ-A.

¹³¹ J.B. McAra to Mining Registrar, 13 January 1969, enclosing D.G. Joll (for Medical Officer of Health, Hamilton) to J.B. McAra, 22 December 1967, Te Aroha Wardens' Court, Mining Applications 1968, 5/1968, BCDG 11289/6a, ANZ-A.

very low figure. Pollution other than pre-existing bacteriological pollution is therefore limited to pollution by erosion, which must in any event, take place during wet periods and again therefore the minor amounts produced by the rain which falls on the tailings running off it seems of little consequence.

Part of the trouble seems to arise through some unauthorized use of the stream. If therefore a secure by-pass for floodwaters is provided, drains are inserted beneath the pit to take off spring water, and a trap built at the foot of the tailings and periodically cleaned out, this should suffice to maintain the present status of the stream. However I understand that the Company have undertaken to do a great deal more than this including building a gabion structure at the lower end of the dump, installing filtering and dry stacking equipment and drainage without the assurance that further demands will not be made.

I believe that the Company's dissatisfaction with the conditions required by the Catchment Board is justified in the circumstances and that it would generally be in the interests of mining that any such conditions should be subject to this Department's approval.¹³²

The catchment board's recommendations to the Warden wanted the same controls as in the earlier licenses to prevent erosion and pollution, and emphasized its 'limited resources for investigations of this nature'. It was worried about 'what might eventually become a very large dump in this small valley' high up the mountain. 'In view of the serious consequences which could possibly follow from a collapse or slipping of the tailings, the depositing of the tailings and the form of the tailings heap' should be supervised by a registered civil engineer.¹³³ At the hearing, the board stressed that its interpretation of 'mining wastes' included water flowing out of all the mine adits as well as water seeping from the pond and rainfall run-off from the dam; it wanted this water ponded and treated for metallic contamination.¹³⁴ The borough council also required the existing conditions reimposed as well as the retaining or planting of trees along the southern boundary of the site 'to provide screening of the area (made unsightly by the

¹³² J.B. McAra to Under-Secretary, Mines Department, 28 January 1969, Inspector of Mines, Box 16C, 13/11/F, vol. 1, MC.

¹³³ R.W. Harris to Mining Registrar, 18 January 1969, with attached Memorandum of Conditions requested by Hauraki Catchment Board, Te Aroha Warden's Court, Mining Applications 1968, 5/1968, BCDG 11289/6a, ANZ-A.

¹³⁴ F.J. Handcock, Memorandum entitled 'Capital Expenditure at Mill', n.d. [January 1969], Norpac Papers, Box 5, NMC 19/4, UA.

operation of the Applicant)' as it wished 'to develop the scenic potential of the route from the Borough to the summit of Mount Te Aroha'.¹³⁵

The warden accepted McAra's views and did not impose any conditions apart from those required under the Mining Act as agreed to in 1966 plus a contour drain to protect the tailings.¹³⁶ As all the catchment board's objections were disregarded, Handcock cancelled the tailings treatment plant ordered from Mitsui.¹³⁷ There being enough space for the tailings, the directors agreed the extra plant would not be needed for at least a year; however, as the slimes would eventually be a problem, \$15,000 was put aside for future needs.¹³⁸

In his annual report, Handcock complained that the catchment board had 'made it difficult to establish proven tailings storage methods' and had 'occasioned delays and increased costs'. The Warden's decision meant that wet storage continued in the enlarged area 'with a contour channel protecting area from surface run off and an underground concrete pipe drainage system for collection of and disposal of seepage and natural springs'. He considered that they had adequate storage for wet disposal for one and a half years, and would 'proceed to make our position more secure in tailings disposal by approach to the Court for such mining privileges as considered essential'.¹³⁹ That the board's objections 'were in their entirety disregarded' was 'a most satisfactory decision', but there could still be difficulties ahead, as Norpac would need to get the warden's approval for access to the Tui Stream for seepage and rainfall run-off from its operations.¹⁴⁰ Handcock feared that the board's restrictive interpretation of the conditions would mean the company 'would be faced with a considerable

¹³⁵ Te Aroha Borough Council to Warden, 23 December 1968, Te Aroha Warden's Court, Mining Applications 1968, 5/1968, BCDG 11289/6a, ANZ-A.

¹³⁶ Te Aroha Warden's Court, Application for a Special Site 1968, 5/1968, BCDG 11289/6a, ANZ-A.

¹³⁷ F.J. Handcock, Report 3/4 for period ending 24 March 1969, Norpac Papers, Box 5, NMC 19/4, UA.

¹³⁸ A.F. Downer to A.G. Pentland, 13 February 1969, North American Partners file, Norpac Papers, Union Hill; F.J. Handcock, Annual Report on Operations at Mine and Mill, Te Aroha, for year ending 31 March 1969, Norpac Papers, Box 4, NMC 30, UA.

¹³⁹ F.J. Handcock, Annual Report on Operations at Mine and Mill, Te Aroha, for year ending 31 March 1969, Norpac Papers, Box 4, NMC 30, UA.

¹⁴⁰ F.J. Handcock, Report 3/4 for period ending 24 March 1969, Norpac Papers, Box 5, NMC 19/4, UA.

plant and installation cost aggregating mine water at all levels and treating it. It would be a difficult and costly project to pond seepage and runoff at tailings and provide a treatment plant efficient at peak run off periods'. These 'unrealistic conditions' went beyond those envisaged at the meeting with the board on 29 November, and he complained that had not the latter interfered when the dam was being built in January 1967 'we would still be placing tailings inside it'.¹⁴¹

In response to the warden's decision, Harris asked A.W. Gibson, the Director of Soil and Water Conservation, what were the board's responsibilities now that none of its conditions were imposed. He also asked how much expense the board would be expected to bear, because the costs were 'an unfair burden on the ratepayers of this Catchment'.¹⁴² The reply was discouraging: Gibson had received a solicitor's advice that a right granted under the Mining Act prevailed over powers granted under the Soil Conservation and Rivers Control Act. Although the board could request that special conditions be imposed, 'the Warden could reject this if he considered that they would inhibit the proper development of a mining venture'.¹⁴³

These concerns would be heightened by the continuing pollution of the Tui Stream. At the end of March Charles Alfred Thom, Health and Building Inspector for the Piako County Council as well as acting Health Inspector for the Te Aroha Borough Council, wrote to the Minister of Mines, Tom Shand, as captain of the Te Aroha Golf Club rather than in his official capacity:

Effluent, which is of a most repulsive colour, has over a period of months at intervals come down the stream and in the piped supply to the Clubhouse, adjoining houses and to the course watering system.

On one occasion a syphon had been placed in the dam containing the effluent and was discharging it into the stream. Witness of this is available if this fact is doubted.

¹⁴¹ F.J. Handcock, Memorandum entitled 'Capital Expenditures at Mill', n.d. [January 1969], Norpac Papers, Box 5, NMC 19/4, UA.

¹⁴² R.W. Harris to A.W. Gibson (Director, Soil and Water Conservation, Ministry of Works, Wellington), drafted 24 January 1969 and sent on 4 February 1969, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

¹⁴³ A.W. Gibson to Hauraki Catchment Board, n.d. [c. February 1969], HCB, Series 2, Box 33, Te Aroha General VIS4-5, vol. 4, WRC.

As several people had complained to Norpac but were 'not being treated seriously', he asked Shand to revoke Norpac's license because it was not fulfilling the conditions. The golf club, 'seriously concerned about the damage to their amenities, and in particular to their water supply for the course which may already have been harmed by the excess silt etc. in the pipes', was considering obtaining a Supreme Court injunction plus damages.¹⁴⁴

McAra told Shand that the pollution was caused by clay being disturbed when building the dam. The only record of pollution by mining effluent was the siphoning referred to by Thom, which was 'to prevent a dam being topped during a short period of pump failure'. The company had assured the Mines Department that this would not recur. As the stream was unfit for human consumption, he recommended that the club obtain its water from the borough supply.¹⁴⁵ Thom's response was to list the eight cases of pollution from October 1968 to March 1969; he assured Shand that he was trying to avoid publicity and was writing as an individual as a 'result of procrastination and difficulty in getting anything done at a local level'.¹⁴⁶ Failing to obtain any action from Shand, he showed the correspondence to Harris on 21 April.¹⁴⁷

On 16 April, the same day that the Borough Engineer from 1964 to 1976, Jon Endert, confirmed the pollution and warned that this was 'very difficult to control and police',¹⁴⁸ Feasey reported the result of the testing of a sample of tap water given to him by a family living in Tui Road. It was the worst sample he had seen of pollution of the Tui Stream. As the Health Department would not act because it was not a public supply, he suggested the council write to the Mines Department 'expressing dissatisfaction' that

¹⁴⁴ C.A. Thom to T.P. Shand (Minister of Mines), 29 March 1969, HCB, Series 2, Box 33, Te Aroha General, VIC4-5, vol. 4, WRC.

¹⁴⁵ T.P. Shand to C.A. Thom, 10 April 1969, HCB, Series 2, Box 33, Te Aroha General, VIC4-5, vol. 4, WRC.

¹⁴⁶ C.A. Thom to T.P. Shand, 17 April 1969, HCB, Series 2, Box 33, Te Aroha General, VIC4-5, vol. 4, WRC.

¹⁴⁷ Noted on the above three letters, HCB, Series 2, Box 33, Te Aroha General, VIS4-5, vol. 4, WRC.

¹⁴⁸ J.E. Endert (Borough Engineer) to Town Clerk, 16 April 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

conditions on the mining license were 'not being complied with, and requesting that appropriate action be taken' to protect the water supply.¹⁴⁹

On 17 April, McAra investigated Thom's complaints. After visiting Handcock's office to tell him that he was investigating a complaint, he accompanied Thom and Feasey on an inspection of the dam and the water intakes for the golf course and two houses.

I inspected a jar of water drawn from a house tap in a house adjacent to the Golf Course. This jar contained about an inch of sediment, apparently of pulverized grey rock. It had been drawn off during fine weather. Mr Thom complained of silt from the water supply covering the 17th green and of the normally clear rocky stream which runs through the course being fouled with greyish silt. It was felt that the silting of the stream, if continued, would convert it from an asset of considerable beauty and an attraction to visitors to a mere drain and thus would represent an irreplaceable loss to the Golf Club and would adversely affect visitors' fees and subscriptions, while the silting of the water supply to the houses rendered the water unusable. When I pointed out that the Health Department had tested this water supply and found that it was unfit for human consumption without being boiled because of its bacterial content, Mr Feasey said that these people had become adjusted to the water and had used it for a number of years without ill-effects and that similar water supplied not certified as bacteriologically pure were often used in rural areas. This water was rendered unusable by the quantity of sediment and discolouration said to have been caused by the escape of tailings into the mill tributary of the Tui Stream.

After being given Feasey's list of dates when pollution had occurred, he inspected the tailings dam. This had

recently been reconstructed and extended and appears to be a much more efficient design than previously, the creek being carried through an 18" pipe under the dam, a well, fitted with a automatic pump, has been sunk at the upper end of the dam to pick up seepage out of the country and the area for the disposal of tailings increased. It is proposed to build a trap at the lower end of the tailings dam to trap silt washed off the sides by rain water and to install launders in place of the alkathene pipe which caused trouble through breaking.

¹⁴⁹ I.E. Feasey to Town Clerk, 16 April 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

It would appear that with these very much improved arrangements and with proper attention the escape of tailings into Tui Stream could be maintained at an acceptable level.

I inspected the intake to the golf course supply which has a branch line going to the old town supply pipeline but which I understand is not used. There was a considerable amount of grey silt in the creek at this point and this had apparently been entering the intake which I thought was poorly designed....

There appears to be little doubt that the Golf Club and the users of water have been injuriously affected by the discharge of tailings and are therefore entitled to some compensation.

He endorsed as 'a fair and reasonable solution' Thom's suggestion that Norpac should meet the estimated cost of \$326 to provide water from the borough supply and also ensure that the discharge of tailings was kept at 'an acceptable level'. Feasey also supported this 'as an expression of good faith by the Company'. However, Norpac was reluctant to meet this cost 'without receiving positive assurance' that it would be the final one. McAra believed this was 'not possible under the circumstances' but that if the latest demands were met this would be a good basis for future co-operation. He thought that Norpac's invitation to the council to visit the dam was an encouraging step towards securing agreement.¹⁵⁰ That Norpac, 'in its own interests', met the cost of a new water supply had previously been suggested to him by Lloyd Jones, Chief Inspector of Mines and Chief Mining Engineer for the Mines Department.¹⁵¹

Feasey told White that the new disposal method 'would work satisfactorily' providing it was operated 'with a real determination by the Management and staff to obviate pollution. This could mean the addition of adequate standby equipment'. He recommended giving the new method a trial period of six months.¹⁵² McAra told Handcock that he was satisfied that Norpac had polluted the stream, and suggested corrective measures; in

¹⁵⁰ J.B. McAra to Under-Secretary, Mines Department, 18 April 1969, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

¹⁵¹ Memorandum by L.S. Jones to J.B. McAra on copy of T.P. Shand to C.A. Thom, 10 April 1969, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

¹⁵² I.E. Feasey to Town Clerk, 22 April 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

reporting this, Hancock insisted that no tailings had been discharged during 1969.¹⁵³

In a letter to one of his directors, Norpac's Secretary, Ernest Kenneth Haddy,¹⁵⁴ wrote that

Frank is having more "pollution" problems. Someone has complained to the Health Department that we are polluting the Tui Stream and, although the company has not been approached officially, there is reason to believe that some sort of investigation is being made. Frank has been asked to attend a special meeting of the Borough Council on the matter. Originally he declined but has subsequently agreed to attend.... Frank believes that the Council is split over it. I personally think that the only real answer ... is to have the Tui Stream defined as classified water.¹⁵⁵

Downer sought Shand's support for this proposal in a letter complaining that

the Hauraki Catchment Board have, in our opinion, been difficult to work with in matters relating to tailings pond and stream run off from the area, and where the Tui stream enters the Te Aroha borough problems can arise through their Building Inspector acting in his capacity as Health Inspector, making certain demands although up to the present moment neither the Inspector of Mines nor the Health Department have raised any issue. This matter can only be settled satisfactorily by the category of the Tui Stream being changed from unclassified water to classified water under the new Water and Soil Conservation Act 1967.... Until this had been done ... the Company is in a very vulnerable position.

He asked that the Mines Department deal with Norpac's application for this change 'as a special case forthwith'.¹⁵⁶ Asked for his opinion on Downer's request, McAra thought the department should agree:

¹⁵³ F.J. Hancock, Report 5/4 for period ending 17 May 1969, Norpac Papers, Box 5, NMC 19/4, UA.

¹⁵⁴ See Death Certificate of Ernest Kenneth Haddy, 1985/48968, BDM.

¹⁵⁵ E.K. Haddy (Company Secretary) to P.B. Marshall, 1 May 1969, Norpac Papers, File 4 [Office file], Union Hill.

¹⁵⁶ A.F. Downer to T.P. Shand, 18 April 1969, Norpac Papers, File 4 [Office file], Union Hill; copy sent to Inspector of Mines, Box 16A, 13/11, file 2, MC.

With regard to the escape of tailings, there is no doubt that damage to the aesthetic value of the Tui Stream which winds picturesquely through the Te Aroha Golf Course, is a real loss to the Golf Club if the past pollution continues and they are therefore entitled to some compensation which I imagine could only be arrived at by arbitration. This must be regarded as an establishment cost as it is logical that the industry should pay for any losses caused to the community by its activities. Pollution should therefore be controlled as far as possible and an arrangement made by the Company with the Golf Club without prejudice.¹⁵⁷

When writing to Downer the day before he was to meet the council to discuss the water supply, Handcock expressed opinions he would never reveal publicly. He began by explaining that water samples were currently being tested, and then commented on Haszard's idea that some or all of the tailings water should be discarded, as at some other mills:

I do feel that to some extent we must do just this; we should never undertake (as Catchment Board requires) to completely arrest seepage and tailings area rain-fall run off and mine drainage where metallic content is present.

We must at mill hold metal content of water to a minimum and will endeavour so to do.

Mine drainage cannot be treated, it would be an intolerable financial cost. In my view N.Z. has never known a heap of tailings and if NZ wants mining it must grow up with tailings aggregation.

In the past all tailings washed down streams. We can retain tailings sands only by building free draining structures.¹⁵⁸

When Handcock met the council, Skidmore hoped 'by 'free and frank discussion' to resolve the question of Norpac paying for the connection to the water supply of those using the Tui Stream. When he stated that 'several complaints had been received of gross discolouration and silting' and that Feasey had proved several cases of pollution, Handcock 'denied that pollution of the stream had been proved'. In response, his letter of 19 November 1968 offering to pay the cost of connection to the water supply was read. Handcock said that he would meet this cost only if the council

¹⁵⁷ J.B. McAra to Under-Secretary, Mines Department, 13 May 1969, Inspector of Mines, Box 16A, 13/11, file 2, MC.

¹⁵⁸ F.J. Handcock to A.F. Downer, 28 April 1969, Norpac Papers, Box 1, NMC 38, UA.

supported Norpac's applications for more mining privileges and would tell the catchment board that it had no objection to Norpac using the Tui Stream. White responded that these conditions were not possible under existing legislation, and Skidmore suggested that the council would support Norpac's conditions only if it was paid \$25,000. Hancock 'proceeded, at considerable length, to record his Company's feeling of frustration at its efforts to establish and develop its operation'. Skidmore 'denied this and said that from his recollection Council had done all it could to help the Industry get started'. When White added that the council had understood that the stream would be piped so that no tailings or waste water would get into it, Hancock brazenly 'denied that piping of the stream was ever envisaged'. After more fruitless debate, Skidmore closed the meeting by regretting that no solution had been found and said they awaited McAra's recommendations.¹⁵⁹

Certain that he alone was right, Hancock continued to treat the local bodies belligerently, as illustrated by a letter from Thom to White concerning the visit on 17 April to the mine site with Feasey and McAra. The latter had been 'insistent on our accompanying him', but as Hancock was reported to have said that Thom was trespassing he asked that Hancock be informed that as a duly appointed Health Inspector he had right of entry.¹⁶⁰ This was done; Hancock's response was a brief acknowledgment and a request that in future he be told in advance, to avoid 'misunderstandings'.¹⁶¹

Norpac's directors supported Hancock's stance. After they met at Te Aroha at the beginning of May, a 'complete tour of the tailings area and related underground pipe drains and surface contour channel was made and the stable nature of fines in the drained area was particularly noted'.¹⁶² Haszard returned from a trip to Japan early in May with details of tailings solids placement and tailings water disposal in Japanese mines: 'timely and

¹⁵⁹ Report of meeting held on 29 April 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha; F.J. Hancock, Report 5/4 for period ending 17 May 1969, Norpac Papers, Box 5, NMC 19/4, UA.

¹⁶⁰ C.A. Thom to Town Clerk, 5 May 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹⁶¹ F.J. Hancock to Town Clerk, 7 May 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹⁶² Minutes of the 24th Meeting of New Zealand Directors of 2 May 1969, Norpac Papers, Box 9, UA.

can be used to advantage', noted Handcock. He did not need to use this new knowledge when six men from the golf club visited: 'a pleasant party without awkward questions and any suggestions'.¹⁶³

In mid-May, Shand told Thom that McAra had confirmed that pollution had happened and that the company would build a silt trap at the lower end of the dam to contain silt washed off its walls. Shand recommended altering the intake of the borough pipeline to avoid silt getting in.¹⁶⁴ On McAra's copy of this letter, the Under-Secretary instructed him to ensure that the silt trap was provided and that Norpac provided an alternative water supply. He considered 'the company should clean out and improve the pipeline intake as a "good neighbour" gesture'.¹⁶⁵ McAra directed Handcock to build a silt trap, provide an alternative source of drinking water for the golf club, do everything possible to prevent pollution, and suggested 'as a gesture of good neighbourliness' that he improve the pipeline intake 'to reduce as far as possible the intake of silt'.¹⁶⁶ Handcock's response was pained:

In view of the close co-operation which has existed between your office and the Norpac management, it was a matter of some surprise that a directive letter such as that of 23rd May should have been forwarded without some discussion between the parties. Norpac Mining Limited is completely uninformed of the scope of your investigations, what pollution offences were committed, if any, or the origin of the complaint.

Norpac have a sizeable investment both of government and private capital, and if permitted to succeed, can continue to create a substantial source of overseas earnings, from an indigenous New Zealand industry. It has installed a modern and efficient mill, and has brought in experienced overseas underground management for the development of the mine. Substantial knowledge in the grinding and flotation of complex ores, and the stacking of finely ground tailings has been developed, and this knowledge is available to your department and the industry at

¹⁶³ F.J. Handcock, Report 5/4 for period ending 17 May 1969, Norpac Papers, Box 5, NMC 19/4, UA.

¹⁶⁴ T.P. Shand to C.A. Thom, 19 May 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹⁶⁵ Under-Secretary, Mines Department, to J.B. McAra, memorandum on T.P. Shand to C.A. Thom, 19 May 1969, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

¹⁶⁶ J.B. McAra to F.J. Handcock, 23 May 1969, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

any time, and it is in this light we would prefer to view the future.¹⁶⁷

On the same day that this letter was sent, Handcock visited McAra to discuss the golf club's complaint and agreed to provide \$270 for the alternative water supply. McAra reported that 'he later rang me and advised that the sum mentioned had been accepted by the President of the Golf Club. Amicable relations appear to have been restored'.¹⁶⁸ To restore amicable relations with Handcock, McAra wrote to thank him for reaching the agreement with the golf club:

I would like to say that your co-operation in this respect is appreciated and I am now hopeful that a much better atmosphere has been created with all parties concerned.

I assure you that I fully realize the difficulties with which you are faced in disposing of mining wastes and I am also aware of the considerable effort and expense to which your Company has gone in your efforts to obtain a solution and I will therefore be pleased to assist in any way which is possible to me.¹⁶⁹

To his directors, when reporting McAra's requirements, Handcock repeated that the managers had 'not been officially aware of this investigation, the need for it, or the nature of it', and was sure that no tailings had entered the stream has during 1969.¹⁷⁰ In fact, McAra had visited him before inspecting the dam and stream, and later had told him his conclusions and suggestions, as Handcock's previous report had reported.¹⁷¹ Unwillingly, as well as supplying water to the golf club Norpac also agreed to meet the cost of providing town water supply to the two

¹⁶⁷ F.J. Handcock to J.B. McAra, 2 July 1969, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

¹⁶⁸ J.B. McAra, Report for July 1969, Inspector of Mines, Box 16B, 13/11/D, vol. 2, MC.

¹⁶⁹ J.B. McAra to F.J. Handcock 4 July 1969, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

¹⁷⁰ F.J. Handcock, Report 6/4 for period ending 20 June 1969, Norpac Papers, Box 5, NMC 19/4, UA.

¹⁷¹ J.B. McAra to Under-Secretary, Mines Department, 18 April 1969, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC; F.J. Handcock, Report 5/4 for period ending 17 May 1969, Norpac Papers, Box 5, NMC 19/4, UA.

properties adjacent to it.¹⁷² For its part, after discussions about what action to take, the council decided to take no action unless a formal complaint was received.¹⁷³

On 29 May, five of the nine borough councillors visited the mill and tailings pond:

A complete walkover of the tailings area included sighting the discharged water gathered by some eleven hundred feet of underground pipes from several seepage points; noting the extent of the seepage in an open ditch presently the commencement point of a 15" diameter drainage pipe, the operative contour channel with its minimal flow of water and the decant pipe carrying settled tailings water to the pump that returns it to the Mill head tank supply. Councillors walked over the area where tailings were being placed without the need for footwear other than shoes. Water discharge from seepage and decant water from tailings carried no solids at all and was very clear.

Or so Hancock reported to White. In addition, they were shown Haszard's slides of the Kamioka mine 'depicting the stowage of some ten million tons of tailings in a valley in country steeper than at Tui, some of these retaining dam structures were up to 300ft high and built entirely of tailings from lead zinc concentrate mills'. Hancock told them (and later White) that because the borough declined to accept his conditions for solving the Tui Stream water supply problem, Norpac had 'no alternative' but to apply under the Mining Act for privileges seen as 'essential for the operation of the industry'.¹⁷⁴ He told his directors that, when it was seen that the tailings decant water gravitating to the return pump was completely clear of solids, a councillor remarked that there was 'no reason following chemical analysis of water as acceptable that this flow could not be channelled into the Tunakohia Stream'.¹⁷⁵ Haszard's slides and the blueprint of one of the Japanese dams were, Hancock told them, 'of

¹⁷² F.J. Hancock to Town Clerk, 20 November 1970, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹⁷³ Minutes of Meeting of Te Aroha Borough Council of 19 May 1969, Minute Book 1969-1971, p. 186, Matamata-Piako District Council Archives, Te Aroha.

¹⁷⁴ F.J. Hancock to Town Clerk, 10 June 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹⁷⁵ F.J. Hancock, Report 6/4 for period ending 20 June 1969, Norpac Papers, Box 5, NMC 19/4, UA.

significant interest and use' in illustrating methods of retaining tailings, and the information might 'well be of assistance in the pending case at the Warden's Court'.¹⁷⁶

This was an application for a tailrace,¹⁷⁷ needed because of metallurgical problems at the mill caused by the oxidation of ore between the time it was broken out and processed. As Downer explained to Pentland, it was

proving necessary for the best results to discharge mill water after ore use under certain conditions, instead of constantly circulating it. With some new reagents this brings us back to the Warden's Court to have our license amended. I won't bore you with all the details required to clear this point, but no stone is being left unturned to present a case which will overcome the objections of modern conservationists.¹⁷⁸

Not all his staff were sensitive to the views of 'modern conservationists'. Whilst the company's solicitor urged that the application should state the water would be free from slimes and solids, Handcock insisted that the company must have the right to discharge water 'on unrestricted terms for proper operation of the mill'.¹⁷⁹

The new pollution control system was working well, the directors were told by Handcock in July:

A sand cone has been installed for separation of sand and slime in the disposal area. This appliance is virtually doing the work of a cyclone sand plant without moving parts and at a very small capital cost. Disposal is now greatly simplified and ultimately

¹⁷⁶ F.J. Handcock, Report 6/4 for period ending 20 June 1969, Norpac Papers, Box 5, NMC 19.4, UA.

¹⁷⁷ For plan, see 'Application for Tail Race License Mt. Te Aroha, Norpac Mining Limited, Decanted Waste Water Disposal', August 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹⁷⁸ A.F. Downer to A.G. Pentland, 11 August 1969, Norpac Papers, North American Partners file, Union Hill.

¹⁷⁹ Minutes of 25th Meeting of New Zealand Directors of 24 June 1969, Norpac Papers, Box 9, UA.

abundant sand will be available for building of retention walls etc.¹⁸⁰

His next monthly report stated that 'sand slime separation by cone operation' was satisfactory, and the accumulated sand was being used to raise the dam level and to cover the exposed clay. 'With the coverage by sand heavy rains have had little affect in sloughing of walls etc', and the position would 'further improve' as more sand became available.¹⁸¹

The council lodged a formal objection to the tailrace, as did the catchment board, which wanted to protect the rights of existing users of the Tui Stream by insisting that water quality must not be lowered.¹⁸² These objections were formalities to allow time for investigation. A meeting in early August of the Works and Town Planning Committee of the council recommended that, because 'every assistance should be given to the Mining company', it be permitted to discharge into the north branch of the Tunakohia Stream.¹⁸³ When Handcock and Carter subsequently met Skidmore, White, and Jon Endert, the borough council's engineer, it was agreed that the decant waste water from the pond be piped to the north branch of the Tunakohia Stream, already polluted by mining. When the council was asked to confirm this agreement, an amendment was carried that 'the matter be referred back to the committee for further details as to the effect of the proposed discharge of waste water' because the stream had several riparian owners and was used by children, horses, and cattle.¹⁸⁴

A special meeting of the Works and Town Planning Committee was held after Endert had arranged for samples to be taken. Samples taken from the stream had revealed that, allowing for the amount of water in it,

¹⁸⁰ F.J. Handcock, Report 7/4 for period ending 12 July 1969, Norpac Papers, Box 5, NMC 19/4, UA.

¹⁸¹ F.J. Handcock, Report 8/4 for period ending 9 August 1969, Norpac Papers, Box 5, NMC 19/4, UA.

¹⁸² F.J. Handcock, Report 8/4 for period ending 9 August 1969, Norpac Papers, Box 5, NMC 19/4, UA; R.W. Harris to Hauraki Catchment Board, draft letter dated 31 July 1969, HCB, Series 2, Box 33, Te Aroha General VIC4-5, vol. 4, WRC.

¹⁸³ Report of Meeting of the Works and Town Planning Committee of 7 August 1969, Te Aroha Borough Council Minute Book 1969-1971, p. 281, Matamata-Piako District Council Archives, Te Aroha.

¹⁸⁴ Minutes of Meeting of Te Aroha Borough Council of 19 August 1969, Minute Book 1969-1971, pp. 270-271, Matamata-Piako District Council Archives, Te Aroha.

the levels of lead, zinc and copper were 'well within the tolerance allowed by World Health standards for domestic use'. As Endert believed there would be 'no serious pollution', the committee agreed to the discharge.¹⁸⁵ A subsequent sample from the recycled water in the tailings pond, which had a higher concentration of minerals than if 'run to waste', revealed no traces 'of any of the usual chemicals used in the process which would suggest that quantitatively such chemicals are used in minute proportions'. Furthermore, as this water would be diluted ten times before it reached the town, there was 'no danger of any kind to animals or humans as the water passes through town'.¹⁸⁶ Early in September Handcock informed his directors that agreement had been reached, although the catchment board would object despite Handcock's discussions with Harris. He also reported that, as further sand went into the pond, the position was 'improving continually', run-off being 'very little after heavy rain'.¹⁸⁷ The board shortly afterwards withdrew its objection to the tailrace on condition that the quality of the Tunakohoia and Omaha Streams was not permitted to go below their existing 'D' classification and the rights of existing users and riparian owners were safeguarded.¹⁸⁸

The day before the warden's court hearing, McAra informed the warden that the company was not seeking to discharge any solid materials. Because the build-up of some chemicals made the water unsuitable for recirculation, some water had to be replaced to get satisfactory treatment. As traces of potassium cyanide and other chemicals used in the ore treatment process might remain, he agreed it was 'reasonable' that the discharge should be regulated to avoid 'danger to plant or animal life'. Records of regular sampling and testing should be kept for him to check. He

¹⁸⁵ Report of Special Meeting of the Works and Town Planning Committee of 27 August 1969; Gilchrist Burns and Johnston to Town Clerk, 14 June 1985, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha. For results of the sample, see L.E. Spackman (for T.J. Sprott and Associates) to J. Endert, 27 August 1969, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

¹⁸⁶ North, Swalbrick, Mills and Westwood to J. Endert, 1 September 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹⁸⁷ F.J. Handcock, Report 9/4 for period ending 6 September 1969, Norpac Papers, Box 5, NMC 19/4, UA.

¹⁸⁸ R.W. Harris to Warden, 16 September 1969, 17 September 1969, HCB, Series 1, Box 205, 7/2, vol. 1; Minutes of Ordinary Meeting of the Hauraki Catchment Board of 17 September 1969, HCB, Minute Books, vol. 15, p. 46, WRC.

also recommended that the Regional Water Board provide standards of purity required, but this suggestion was withdrawn at the hearing.¹⁸⁹ The warden was convinced by the evidence from Norpac's mine manager and consulting engineer that the decanting method proposed would efficiently remove all solids in suspension and the mineral content did not 'constitute a hazard to public health'. The license was issued subject to copies of the weekly analyses of the effluent from all decant pipes being sent each month to McAra and the mineral content not exceeding the level determined by the Medical Officer of Health.¹⁹⁰ Norpac's directors, after noting that this decision meant that the control of the tailrace remained under the Mining Act and the catchment board had no jurisdiction, recorded their 'recognition' of Hancock's 'part in the success of this application'.¹⁹¹

Later that same month, in a report sent also to the Health Department, Norpac's consulting chemist wrote that the Tui and Tunakohia Streams were polluted by the mountain, not by mining:

All the water flowing from the watershed is contaminated with amounts of lead, copper and zinc to the extent that it is no longer potable. This is nothing to do with the operations of the Norpac mine or mill. It appears that the whole of the mountain and the soil in the area contains a considerable concentration of metals which are leached out by the passage of rain water through and over it.

The tailings effluent would not cause discolouration or silting of the stream. The maximum daily effluent discharge permitted into the stream of 120,000 gallons would have a 'negligible' impact because it had a daily flow of from five to ten million gallons. Some analyses indicated that the metal content of the effluent was less than that of the streams, and the mill obtained its water from a spring which already contained toxic metals. The Tunakohia was not suitable for human consumption, but the influence of

¹⁸⁹ J.B. McAra, 'Application 30/6/69 for Tail Race License under the Mining Act: Norpac Mining Ltd.', 22 September 1969, Te Aroha Warden's Court, Mining Applications 1969, 5/1969, BCDG 11289/6a, ANZ-A.

¹⁹⁰ Decision of T.B. Mooney (Warden), 23 September 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

¹⁹¹ Minutes of 26th Meeting of New Zealand Directors of 23 September 1969, Norpac Papers, Box 9, UA.

the mill was 'quite negligible'.¹⁹² McAra reported that the effluent showed no traces of cyanide.¹⁹³ In November Dawson was told by the Regional Veterinary Officer of the Department of Agriculture that dilution meant that the lead in the Tui Stream should have no effect on stock.¹⁹⁴ After receiving this advice, Dawson told Hancock that he had no objections to discharges from all the decant pipes, but he would arrange for periodic checks of water quality.¹⁹⁵ Hancock informed his directors that Dawson had accepted the consulting chemist's recommended mineral content of the waste water discharge (zinc 15.00 ppm, copper 2.50 ppm, and lead 0.25 ppm) and that Endert had accepted Norpac's pipe specification and decant method. Construction would commence 'immediately'.¹⁹⁶ Now the discharge from the pond was diverted to the Tunakohoia Stream rather than recycled to the mill, which in future pumped water from the spring within the pond (a later investigation reported that this water was not contaminated by tailings).¹⁹⁷ This was a satisfactory result for the company, as Downer noted in a letter to Pentland:

During the current year costs were inflated by some non-recurring items in respect Catchment Board requirements in mill water discharge and stowage of tailings. Both these points have been overcome in that millwater can be discharged into the Tunakohoia, and the area now available for tailings provides for about 400,000 tons, and an application is in for a further area giving an overall capacity of 1,000,000 tons.¹⁹⁸

¹⁹² L.S. Speckman (of T.J. Sprott and Associates, Analysts, Industrial, and Consulting Chemists) to F.J. Hancock, 30 September 1969, Norpac Papers, File 4 [Office file], Union Hill; copy in Health Department, YCBE 1990/49b, ANZ-A.

¹⁹³ J.B. McAra to Under-Secretary, Mines Department, 24 September 1969, Inspector of Mines, Box 16C, 13/11/F, vol. 1, MC.

¹⁹⁴ Peter Gallagher (Regional Veterinary Office, Department of Agriculture) to J.F. Dawson, 4 November 1969, Health Department, YCBE 1990/49b, ANZ-A.

¹⁹⁵ J.F. Dawson to F.J. Hancock, 10 November 1969, Health Department, YCBE 1990/49b, ANZ-A.

¹⁹⁶ F.J. Hancock, Report 11/4 for period ending 1 November 1969, Norpac Papers, Box 4, NMC 34, UA.

¹⁹⁷ Tonkin and Taylor, 'Stability Study of Norpac Mine Tailings Dam', May 1974, p. 2, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

¹⁹⁸ A.F. Downer to A.G. Pentland, 15 December 1969, Norpac Papers, North American Partners file, Union Hill.

For his part, the despondent catchment board secretary had written in September to the secretary of the Otago Catchment Board to ask whether it had similar difficulties caused by mining and pollution. His board's problem was 'how far to go with formal objections if the pollution angle tends to be overlooked (more or less) by a mining-oriented Court'.¹⁹⁹ No reply is to be found in the files.

1970

Experience with Norpac shaped the catchment board's submissions to the Labour and Mining Bills Committee of parliament, which was considering the Mining Bill introduced in 1969. The first submission, drafted by Harris, dealt with mining and the board's responsibilities. He pointed out that in mountainous areas such as the Coromandel peninsula, with steep slopes, many streams, and heavy rainfall, it was 'reasonable to suppose that the Mining Industry can only observe effective water and soil conservation practices by the taking of stringent precautions'. As this would mean extra costs it would be claimed that these were 'not really necessary, or is economic, and has never been required in the past'. He explained the lack of clarity in past legislation and the way the Mining Act took precedence over attempts by statutory bodies to protect water quality. The new Bill seemed likely to repeat the system laid down in the Mining Act of 1926, which meant that 'only specific conditions attached to the license have any real significance'. The proposed legislation was likely to mean the catchment board was ineffectual in the face of 'increasing interest in mining in the Coromandel-Kaimai Range, and the number of active mining ventures'.²⁰⁰ The board was very concerned that mining was to receive 'special encouragement' at the expense of its being able to provide this protection.²⁰¹ The following month Harris made a second submission dealing with the threat of more silt entering the river if mining increased.

¹⁹⁹ Secretary, Hauraki Catchment Board, to Secretary, Otago Catchment Board, 11 September 1969, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

²⁰⁰ R.W. Harris, 'Mining and Catchment Authority Administration', 3 February 1970, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

²⁰¹ R.W. Harris to the Chairman and Members, Labour and Mining Bills Committee, 16 February 1970, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

‘On the present comparatively modest scale of mining, the incidence of induced erosion, pollution of natural waters, destruction of native forest, and so on, resulting from mining, is relatively small’. However, large-scale mining could magnify all these problems unless there were ‘stringent precautions’ concerning roads, controlling the building of tailings and mullock heaps, and especially open-cast mining. To stem the trend towards increasing pollution and erosion new mining enterprises must not ‘merely repeat the past’ but instead ‘fully observe the provisions’ enacted to conserve water and soil.²⁰²

The Ohinemuri, Thames, and Coromandel county councils also made submissions. One of their concerns was that local bodies were not to be notified about applications for mining privileges, citing ‘numerous cases’ where individuals and companies had polluted streams and destroyed bush when prospecting. ‘It is realized that the terms of a license might be construed as sufficient to preclude this type of damage but with the Inspector of Mines resident at Huntly and making infrequent visits the damage is likely to be done before any material action can be taken’.²⁰³

In February Norpac applied for Special Tailings Site No. 4, of five acres, at Fern Flat. As this would require rerouting part of the mountain road, there was another site visit by several councillors and council officers at which Hancock convinced most councillors that it should be approved. Opinions were divided in the subsequent council debate, but it was agreed to after a clause was added requesting Norpac to provide ‘as soon as possible ... a projected forecast of its future requirements ... concerning the disposal of tailings and waste water from its operations over the next 10 year period’.²⁰⁴

In April, Hancock reported that a ‘rise in slime level’ had ‘necessitated immediate raising of level of ponding area generally’.

²⁰² R.W. Harris to the Chairman and Members, Labour and Mining Bills Committee, 2 March 1970, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

²⁰³ R.M. Malcolm (Ohinemuri Country Clerk) to the Members, Labour and Mining Select Committee, 9 February 1970, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

²⁰⁴ Report of a Meeting of the Works and Town Planning Committee of 10 February 1970; Minutes of Borough Council Meeting of 17 February 1970, Te Aroha Borough Council Minute Book 1969-1971, pp. 398-399, 412, Matamata-Piako District Council Archives, Te Aroha.

Retaining walls were to be built up 'with least possible delay' while the weather held. An additional cone had been acquired 'to assist in distribution of sand portion'.²⁰⁵ Next month he reported that 'tailings area retaining walls have been built up considerably and new cone brought into operation'. The old cone was 'now used in series', which meant that the overflow was 'virtually pure slime'.²⁰⁶

Norpac's worry that conservation concerns threatened its operations was indicated by its setting up, in conjunction with six other mining companies working in the Hauraki district, of a Mineral and Mines Association. This supported the development of mineral resources and 'a unified approach in dealing with legal and physical matters of common interest'. Norpac's secretary, Peter Carter, informed the press that the association was worried about the new Mining Bill and the new Water and Conservation Amendment Bill. He claimed the companies were all 'taking a responsible attitude towards pollution and conservation', and emphasized the substantial economic benefit to the community of the industry.²⁰⁷

Despite such soothing words, the company was still difficult for local bodies to deal with, as indicated by the way in which it applied for mining rights over 1,000 acres that encompassed all the streams needed for borough water supply in summer. It gave insufficient time to consider the plans, and when the council's solicitors sought discussions they 'were surprised to receive an instant rebuff' and a refusal to confer. This attitude was 'a complete reversal of procedure in past applications'. When the warden considered the matter on 27 August, he suggested that 'the parties should get together and settle the conditions and then come before him' at an adjourned meeting on 24 September.²⁰⁸

The catchment board was also concerned about what Norpac was doing. Handcock recorded a visit on 12 August: 'a party of 18, being all Board members plus engineers and secretary - a very short visit that lacked

²⁰⁵ F.J. Handcock, Report 4/5 for period ending 18 April 1970, Norpac Papers, Box 6, NMC 19/5, UA.

²⁰⁶ F.J. Handcock, Report 5/5 for period ending 16 May 1970, Norpac Papers, Box 6, NMC 19/5, UA.

²⁰⁷ *Te Aroha News*, 6 August 1970, p. 1.

²⁰⁸ Gilchrist Burns and Johnston to J.C. Carroll and Son, 27 August 1970; Gilchrist Burns and Johnston to Town Clerk, 27 August 1970, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

inquiry or explanation'.²⁰⁹ The board was not opposed to the extra 1,000 acres as long as conditions preventing pollution were imposed, but it was worried about the increasing size of the pond.²¹⁰ But, as White told Harris,

obviously there are two conflicting interests in the mountain area, each of which seems to be protected by Acts of Parliament, and Council is seeking the support of your Board ... to ensure either, that Council's water rights are suitably safeguarded or alternatively to determine that the two uses on the mountainside are incompatible and to support a case that the cost of providing and obtaining water from an alternative source should not be a burden on the Council's ratepayers.²¹¹

Harris assured White of his support at warden's court hearings, and would give the council a copy of the report he was preparing.²¹² He asked the board members whether they should just report the problem to the warden or 'take a positive action' by pointing out 'a conflict of interests' and 'bluntly' state that there could 'either be a mine or a water supply but not both' in the small mountain streams.²¹³ To the mining registrar, Harris wrote that, because of the risk of pollution, the streams must be regularly tested for deterioration in quality. The board offered to do this provided it was 'sufficiently reimbursed for the costs'. He expected all parties concerned, including the government, to contribute.²¹⁴ (All the alarm was unnecessary, for negotiations with the Mines Department over the question

²⁰⁹ F.J. Handcock, Report 8/5 for period ending 8 August 1970, Norpac Papers, Box 6, NMC 19/5, UA.

²¹⁰ R.W. Harris to Mining Registrar, 21 August 1970, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

²¹¹ J.R. White (Town Clerk) to R.W. Harris, 8 September 1969, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

²¹² R.W. Harris to J.R. White, 15 September 1970, Te Aroha Catchment Board, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

²¹³ R.W. Harris, Memorandum entitled 'Notification of Water Uses under the Water and Soil Conservation Act 1967', 8 September 1970, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

²¹⁴ R.W. Harris to Mining Registrar, 18 September 1970, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

of royalties dragged on during 1971, and this delay meant that no work was done in the area applied for before the company collapsed.)²¹⁵

The year ended with Handcock informing White that, in response to the council's request, Norpac would meet the cost of disposing of decant water into the north branch of the Tunakohoa Stream instead of into the tributary of the Tui Stream that ran under the tailings pond.²¹⁶ As a footnote to the arguments during the year, and as an illustration of how Handcock and the Warden was regarded by the staff of the local bodies, a hastily scribbled note to Harris from David Griffiths, Soil Conservator for the Hauraki Catchment Board, is revealing. He reported that Endert had brought Report No. CD 2104 by the DSIR, published in August 1968,

into the office today for us to have a look at. It was recommended to the Te A. B. C. by Mr Handcock who in effect said that this proves conclusively that the waters of the South branch of the Tunakohoa St are totally unsuitable for future water supplies in that in the stream tests show that there was 500 ppm of Pb.[lead]. He failed to mention unfortunately that the tests were taken of sediment on the bed of the stream & not the stream waters. Apparently had almost convinced the Borough until someone asked whether the tests were in the water or not as Endert has tests taken by the Health Dept showing that there is only 0.01 ppm Pb in this stream... Mr Endert would like us if the point is brought up by the Company that they have tests proving that there is 500 ppm of Pb in the stream, to ask whether these are tests of the water or tests of the soil or stream sediment, as Mr H. could endeavour to mislead the Warden as he tried to mislead the Borough.

Mr White apparently does not want us to tell the Warden that we have the Health Dept's figs in case the Warden says that the water is OK what are they worrying about ... or something.²¹⁷

1971

²¹⁵ F.J. Handcock, Reports 8/5 for period ending 8 August 1970, 5/6 for period ending 15 May 1971, 6/6 for period ending 12 June 1971, Norpac Papers, Box 6, NMC 19/5, UA; Te Aroha Warden's Court, Mining Applications 1970, 5/1970, BCDG 11289/6a, ANZ-A; A.B. Cowie to C. Wallace, 8 June 1984, Mines Department, MD 1, 12/46/1038, held by Ministry of Commerce, Wellington.

²¹⁶ F.J. Handcock to Town Clerk, 20 November 1970, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

²¹⁷ Memorandum by David [Griffiths], 23 September 1970, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

This year saw the passing of a Mining Act and a Water and Soil Conservation Amendment Act, both of which recognised that there needed to be more protection for the environment compared with how this had been treated in the old days.²¹⁸ However, these Acts did not affect Norpac's operations, as it held existing rights.

During the Christmas shutdown period, work on the pond included relocating the No. 2 sand cone and related piping.²¹⁹ In February, McAra contacted Handcock over an effluent discharge sample taken in the previous December that had 'close to the critical amount' of lead, and asked for details of the sampling method used.²²⁰ McAra inspected this when he visited later in the month, and then formally warned Handcock that it did not comply with the conditions laid down: the samples were being taken half a mile downstream, not at the point of discharge. To test whether this made any difference he intended to take samples at both points in Handcock's presence when he visited on 23 February.²²¹ As nothing further was recorded, this dispute must have been resolved satisfactorily. The directors expected that the second tailings site would provide 'adequate facilities for many years', and in autumn the company experimented to see if it was possible to establish 'grass coverage on prepared tailing surfaces'.²²²

On 5 April there was a moment of high drama. James Henry Lynam, Transmission Superintendent for the New Zealand Broadcasting Corporation, was driving up to the mountain road when he witnessed what

²¹⁸ For Mining Act, see in particular *New Zealand Parliamentary Debates*, 7 June 1971, vol. 372, pp. 703-704, 18 August 1971, vol. 373, pp. 2485-2488, 19 August 1971, vol. 373, pp. 2497-2499, 2501, 2508-2510, 2514, 2518-2519; for Water and Soil Conservation Act, see in particular speech by P.B. Allen (Minister of Works), 19 August 1971, *New Zealand Parliamentary Debates*, vol. 373, pp. 2529-2533.

²¹⁹ F.J. Handcock, Report 2/6 for period ending 20 February 1971, Norpac Papers, Box 6, NMC 19/6, UA.

²²⁰ J.B. McAra to Norpac, 12 February 1971, Mines Department, MD 1, 12/46/1038, held by Ministry of Commerce, Wellington.

²²¹ J.B. McAra to F.J. Handcock, 22 February 1971, Mines Department, MD 1, 12/46/1038, held by Ministry of Commerce, Wellington.

²²² Norpac Mining Ltd, Directors' Report for period ending 31 December 1971, Box 9; F.J. Handcock, Report 3/7 for period ending 18 March 1971, Norpac Papers, Box 6, NMC 19/6, UA.

he later recalled as a 'near disaster'. There had been rain, and a lot of water was contained within the pond. He thought a machine shaping its walls probably cut through the wall, for there was a sudden rush of water, it started to collapse, and the machine fell into the pond. The driver had managed to get away in time, and as the water level lowered the flow of water stopped; but silt ended up on the golf course.²²³

This was an accurate recollection, apart from the embellishment of the machine falling into the pond, as the account written on the day by Carter revealed:

8.20 – PJC[arter] on way to town to pick up Mail ... at mill site Acland [the mill superintendent] stated some seepage from front wall of dam.

9.00 - PJC arrived back from town & walked down to Tailings area where Haszard & [Percy] Growden [foreman of the surface workers] were discussing dam condition. Both expressed concern & misunderstanding as to present state of dam. Growden unhappy with 10' depth of water in front area of dam - Haszard unhappy with present structure of dam. Inspected front of dam with Haszard, who pointed out seepage in a couple of places & cracks. Haszard very apprehensive about any machine (FEL or bulldozer) work on top of front of dam. Growden anxious to re establish cone laying unused at road side of dam. Requested a quick supply of 9" x 2" timber & carry cone & existing timber with FEL to new position.

9.30 - Haszard rushed into office & told PJC that dam front had gone. Did not know if Percy [Growden] & Stephen Growden had made it to safety. Attempted to calm Haszard & put immediate call through to FJH[andcock] in Thames. Requested J[ohn] A[batematteo], the mine manager] to come down from mine & assist. Walked to Mill & instructed Acland to inspect immediate damage to Dam front etc & remained temporarily with Haszard to see that mill was closed down.

Percy Growden was driving FEL when wall collapsed. Stephen Growden was in vicinity but jumped clear & warned two men ... working on gabion structure to get out. This they did just in time, one man apparently losing his jumper & lunch.

Subsequent inspection showed that water had flowed down narrow valley & risen to a considerable height, sweeping away gabion structure. The two men concerned were fortunate that Stephen Growden had warned them in time. The water level in the lower stretches of the Tui immediately prior to & through the golf course had also risen but on inspection at 10.10 had fallen again to a reasonable level. All indications were that the stream

²²³ Interview with James Henry Lynam at Te Aroha, 1 July 1995.

bed & culverts had managed the flow but that considerable clay had been swept away with the head of water & was very obvious at the main road creek level.

1.45 Mill closed down by this time & men available. Haszard took control having quickly recovered his composure on observing no loss of life or apparent damage at valley floor level. Growden by this time was visibly shaken but following a brief spell & cup of tea returned to assist.

11.25 Call from Moran²²⁴ - concerned at dirty water & stock waterway. Calmed him down & told him that volume of water had carried clay down hill. Gang of men working on fault & all would be well.

11.45 PJC drove down to bottom of hill & requested Bottomley²²⁵ to bring up trailer immediately. Haszard looking very sick and shaky again.

Met two catchment board men at bottom of hill - past cattle stop - had received complaints of dirty water - informed them a large volume of water had been accidentally released & had carried a quantity of clay with it. They were aware of sudden increase in volume - did not visit mill site as a result of our conversation.

12.00 Rang Thames - Grant²²⁶ informed me that FJH left an hour ago.²²⁷

Handcock upon arrival telephoned Feasey and then wrote to him giving his version of events: a version markedly less dramatic than Carter's:

At 9.30 a.m. this day a water pondage adjacent to the sand cone and down stream of the main tailings area displaced a section of the retaining bank and continued down mill stream overtopping the under-construction gabion work.

Eyewitnesses say this flow passed over the gabion work area in approximately eight seconds.

Repairs to the water pondage bank were commenced forthwith and will be completed tomorrow.

Restoration of the gabion area has also been commenced....

We regret this occurrence and the effect on the draw off from the stream, we will make three men available tomorrow to restore

²²⁴ Presumably a farmer at the foot of the hill: not listed in electoral roll.

²²⁵ Presumably Edward Owen Bottomley, a contractor who lived at Waihou: *Piako Electoral Roll, 1972*, p. 28.

²²⁶ Peter Croydon Grant, engineer?: *Coromandel Electoral Roll, 1972*, p. 124.

²²⁷ P.J. Carter, Memorandum entitled 'Tailings Dam Collapse', n.d. [5 April 1971], Norpac Papers held by Inspector of Mines, Box 16D, ML 4/70, Royalty Details file, MC.

the small fore-bay area at the pipe inlet and scour the main 4 inch pipe line as far as the scour valve....²²⁸

To his directors, Handcock described the event as follows:

On April 5th at 9.30 a.m. a temporary pondage or water holding area adjacent to and associated with a sand cone and tailings area proper through deterioration of sand grading precipitated a body of water causing a subsidence which displaced a section of retaining bank. The main tailings dam was in no way affected by the occurrence. Repairs were effected and milling resumed by 3.30 p.m. the same day.²²⁹

This attempt to minimize the reality of what had happened was also an attempt to mislead. The clearest and most detailed account of which portions of the pit were affected was made by David Griffiths, which revealed Handcock's evasiveness:

In response to a telephone call at about 10.55 a.m. on 5 April 1971, from Mr J. Wilson, of the Te Aroha Golf Club,²³⁰ an inspection was made of the Tui/Omahu Stream in the vicinity of the bridge over this stream at the main entrance to the Golf club. It was obvious that the stream had recently been flowing some 3Ft higher than when we inspected it, and it was dropping quite quickly.

The water carried a very heavy load of clay silt and it was apparent from froth below the waterfall that there were mine tailings liquor present in the stream. The silt deposit along the banks of the stream was up to 2" to 3" deep.

Mr [Roderick Kaye] Moreton [a hydrologist]²³¹ collected a sample of this water and it was a thick suspension of clay which took a long time to settle out and after 2 weeks had settled down to a deposit of approximately 1/3 of a milk bottle or 30-35% by volume or 300,000-350,000 p.p.m.

We spoke to Mr Carter, Office Manager for Norpac Ltd, and he confirmed that there had been a break out.

Later we went up to the ponds to inspect the damage, and met Mr Handcock, who explained things as well as he could. He

²²⁸ F.J. Handcock to I.E. Feasey, 5 April 1971, Norpac Papers held by Inspector of Mines, Box 16D, ML 4/70, Royalty Details file, MC.

²²⁹ F.J. Handcock, Report 4/6 for period ending 17 April 1971, Norpac Papers, Box 6, NMC 19/6, UA.

²³⁰ John Ronald Wilson, a farmer of Stanley Avenue?: *Piako Electoral Roll, 1972*, p. 323.

²³¹ *Piako Electoral Roll, 1972*, p. 208.

mentioned that he was pleased to see us, so that he could explain things before every thing had been returned to normal.

Apparently there had been two ponds on the tailings heap, liquor running from the western to the eastern pond through a drain, cut through a low bank. A section of the Western bank had broken or collapsed and liquor spilling over had gullied, back into the sandy tailings and cut a 10'-20' wide gully.

The area of the pond was approximately 80' x 80' = 6,400 sq ft and was at the most 4ft deep = 25,000 cubic ft and at 6 gals/cub ft approximately 150,000 gals of liquor had escaped. In fact the quantity of water was probably considerably less than this and more like 100,000 gallons.

Tailings were evident for some distance downstream....

The cause of the failure is not known for certain, but it is possible that the drain between the two ponds may have blocked, raising the head and causing a portion of the dam to blow out, or alternatively, that the ramp down the western face may have caused a weakening of the dam. But the only explanation for a sudden break out is that the drain blocked. Apparently two men were working in the valley downstream of the tailings and building a retaining structure which was also washed out by the flood.²³²

Although the problem with the tailings was not reported in the press, thus avoiding public controversy, the local bodies were concerned at the occurrence and its implications for the future. Feasey informed the Works and Town Planning Committee that

a small tailings dam (80' x 80' x 4') at the mill site collapsed and water and silt discharged into the Omahu stream from which Council is taking part of its water supply. This Borough was not notified at any stage of the occurrence. The Catchment Board, however, was notified and is investigating the matter.

The Committee felt that such an accident should never have occurred if the tailings dam had been properly constructed and was concerned at the possible danger to the public. The Company has agreed to clear the Borough intake.

The committee recommended that the company be told of the council's concerns and that it required precautions to prevent another occurrence

²³² [David Griffiths], Memorandum entitled 'Failure of Norpac Tailing Dam on Mt. Te Aroha', 21 April 1971, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

‘when a much larger slip could have disastrous results’.²³³ The full council concurred, and formally complained that no official report had been made to its staff. As this was the second major stream pollution, it sought assurances that adequate precautions would be taken ‘to prevent any shifting or collapse of the tailings area’.²³⁴ Hancock replied denying that the main tailings dam had been affected: a ‘temporary pondage or water holding area, adjacent to and associated with a sand cone and tailings area proper, through deterioration of sand grading precipitated a body of water causing a subsidence’. To prove that he had contacted council staff, he included a copy of his letter of 5 April to Feasey. He added that delays in getting the special site license had ‘severely hampered the execution of necessary work in this and adjacent site license areas’, for otherwise this work would have been done during the Christmas shutdown. Rebuilding the gabions and other work would prevent future problems.²³⁵ In Carter’s initial draft of this letter, possibly dictated by Hancock, there was an additional paragraph claiming that

only a minimum of tailings sand had been carried by the released water. Mr Griffiths queried the discolouration of the Tui Stream at its lower level. On inspection it was determined that clay & silt had been picked up by the water on its way down the valley and that virtually no tailings had been released.²³⁶

Presumably Hancock omitted this statement because he realized Griffiths knew that tailings had been traced for some distance down the stream.

As Hancock had not informed McAra of the pollution, he first heard of it through a telephone call from Feasey; he decided to wait for a written

²³³ Report of a Meeting of the Works and Town Planning Committee of 7 April 1971, Te Aroha Borough Council Minute Book 1969-1971, p. 808; see also I.E. Feasey to Borough Council, 13 May 1971, Te Aroha Borough Council Minute Book 1969-1971, p. 833, Matamata-Piako District Council Archives, Te Aroha.

²³⁴ Town Clerk to Secretary, Norpac Mining Ltd., 16 April 1971, Norpac Papers held by Inspector of Mines, Box 16D, ML 4/70: Royalty Details file, MC.

²³⁵ F.J. Hancock to Town Clerk, 20 April 1971, Inspector of Mines, Box 16C, 13/11E, vol. 1, MC.

²³⁶ Draft letter to Town Clerk, in P.J. Carter’s handwriting, n.d. [between 17 and 19 April 1971], Norpac Papers held by Inspector of Mines, Box 16D, ML 4/70, Royalty Details file, MC.

complaint before responding.²³⁷ This did not come until three weeks later, when White wrote that ‘through our Mr Feasey’ McAra was ‘aware of the recent collapse of a small tailings dam’ and asked for adequate precautions to prevent a repeat.²³⁸ McAra immediately telephoned Handcock and then wrote seeking an explanation and asking how a recurrence would be prevented, for ‘it would appear’ that the dam was ‘insecure at present’.²³⁹ In his dictated response, Handcock stated that the company was

surprised that based on information supplied by a clerical officer of the local Borough Council you saw fit to make the statement that the Tailings Dam structure is unsafe. We can recall no previous comment, written or verbal, by you or your department relating to the insecure nature of the existing structure & following our telephone conversation of yesterday were left with the impression that you appreciated the current work being carried out would consolidate an already strong, safe dam rather than strengthen an unsafe one.

The release of water on April 5th was not intended, but we reiterate that the occurrence in no way affected the main dam structure. An area of water in front of the clay dam was released & flowed down the Tui Stream. No tailings were carried with this water, but a quantity of clay from the banks further downstream was picked up & badly discoloured water flowing through the golf course & under the main road. Hauraki Catchment Board personnel visited the Tailings area & the stream & will verified these facts.²⁴⁰

Presumably Carter, who took down this dictation, pointed out that the water had come not from what Handcock described as ‘an area of water’ in front of the main dam but from behind it, scouring the front of the dam and enabling some tailings to escape into the stream. Whatever the reason, this draft was not typed and instead a brief letter was sent which in provocative style denied that the dam was insecure:

²³⁷ Memorandum from ‘Carol’ to J.B. McAra, 7 April 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²³⁸ Town Clerk to J.B. McAra, 28 April 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²³⁹ J.B. McAra to F.J. Handcock, 29 April 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²⁴⁰ F.J. Handcock to J.B. McAra (draft), 30 April 1971, Norpac Papers held by Inspector of Mines, Box 16D, ML 4/70, Royalty Details file, MC.

The structure was built over the Christmas/New Year period 1966/67 in accordance with the accompanying drawings and is well known to you. We appreciate your enquiry and suggest that a visit be made to the site so that full explanation of “the insecurity of the structure” can be made know to us.²⁴¹

The secretary of the golf club then complained to McAra that after the ‘collapsing of the dam’ their reservoir had washed away, their water system was blocked, and they were without water for five days.²⁴²

McAra inspected the dam on 24 May, when Handcock had returned from leave. As McAra had neither sought nor received any information from the catchment board and the damage had been repaired by this time, Handcock was able to convince him that less water had escaped than had really happened and that no tailings had entered the stream. In his report, McAra wrote that Handcock had explained that

a small breakaway of a pocket of water of the order of several thousand gallons which had been allowed to accumulate near the crest of the dam through the cone discharge not being properly controlled to maintain the gradient of about 6% from the cone discharge to the pond at the far end.... This appears to have shifted a quantity of red clay which had built up at the foot of a waterfall about 300 yards from the dam, where it had been dumped from roading excavations.

The main body of water in the dam at the time would be within 100ft of the eastern end of the tailings dump so that there was no danger from this as there would be over 100ft of tailings above water level before the pocket of water near the crest of the dam would be encountered. This pocket would occupy a small corner near the crest on the south-western corner of the dam and being close to the coarse, freshly deposited material, would saturate it and cause it to slump suddenly and break away and run down the creek. Two men were working on the gabion structure in the bed of the stream about 600ft downstream from the dam which is intended to act as the main downstream buttress of the dam when it is extended. This gabion structure should provide an excellent support when it reaches the height of the dam.

²⁴¹ F.J. Handcock to J.B. McAra, 30 April 1971, Norpac Papers held by Inspector of Mines, Box 16D, ML 4/70, Royalty Details file, MC; copy with accompanying engineering drawings in Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²⁴² K.C. McGirr to J.B. McAra, 3 May 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

It seems that no one concerned with the maintenance of the dam realised the danger of allowing a pocket of water to accumulate in the coarser sand near the crest although instructions had been issued for the regular inspection of the cone discharge....

What seems to have occurred to cause the collapse of a section of the face of the dam is that the coarser sand from the underflow of the hydraulic sand separator became saturated owing to the formation of a pool of water above it and a film of water formed between the individual grains of sand which was thus "fluidised" and lost all its cohesive properties so that it suddenly slumped down into the creek bed together with the pool of water above it. This pocket of water would travel swiftly down the creek as a solid block of water. One observer is said to have estimated that it filled a space about 5ft high by 12ft wide in the stream bed and passed in approximately 8 seconds.

This occurrence shows that much greater care and understanding is required in the control of the tailings dam and Mr Handcock has undertaken to see that in future half-hourly inspections are made of the sand-cone discharge to ensure that the proper gradient is maintained from the cone discharge to the pond and no build up of water is allowed to occur between the cone discharge and the pond.

To check the position thoroughly I think it will also be necessary to determine as precisely as possible all factors involved in maintaining the stability of the dam such as the effect of pressure and water content on the cohesion of the sand particles in the face of the dam and also the range of particle sizes and the permeability of the material between the point of tailings discharge into the dam and the actual pond to determine the limits to which the pond can be allowed to extend.

This could best be carried out by a soil engineer with a knowledge of such structures. I think it will probably be found that the permeability of the tailings beyond half-way between the face of the dam and the eastern (mill end) of it is negligible owing to the deposit of the finer fraction in this area and that the pressure exerted by several feet of thickness of this material gives an adequate degree of coherence and stability to maintain the pond in this portion. However, until this has been reliably determined it seems necessary to restrict ponding to this portion.

There are three 4" tailings water overflow discharge pipes in the tailings pond and these seem adequate to deal with any foreseeable intake as Mr Handcock informs me that the maximum rise in level due to phenomenal rains so far experienced has been four inches.²⁴³

²⁴³ J.B. McAra, Report for May 1971, Inspector of Mines, Box 16B, 13/11/D, vol. 2, MC.

Lloyd Jones, who had received a copy of White's letter of 28 April, was confused about whether the main dam had been affected. After noting that Hancock had given no explanation of what had happened, he asked for more information from McAra, whom he said had 'accepted that there had been a breach of conditions without first checking yourself'.²⁴⁴ In response, McAra sent Hancock's latest letter, written after his inspection on 30 May. This gave details of the piping system being installed at the base for decanting excess water and promising that 'final drawings of Area 2 requirements' would be agreed with McAra before construction started. Further details would be sent, and he was invited to collect from him a sample block of solidified tailings 'representative of fines deposition adjacent to decant pipe, in Area 1'. This sample was collected during the 'Christmas shutdown period in 1967 (the annual dewatering and drying out exercise)' and was 'of interest in appreciating possible final condition of area at depth' when operations ceased.²⁴⁵

Jones supported McAra's conclusions and recommendations, adding it was 'to be hoped' there would be 'no repetition of this failure which could have had more serious results if a breach had really developed in very heavy rain'.²⁴⁶ He wondered whether Norpac was still employing an engineer to supervise the dam construction. Clarifying the issue of responsibility raised by McAra, Jones wrote that 'the primary responsibility' lay with the company. The department's responsibility was to see that conditions were complied with and that the dam was safe. It was 'within our powers to require civil engineering design of tailings dams and the company should show proof that this has been done'.²⁴⁷ McAra therefore asked Hancock if a civil engineer was still supervising the work, and instructed him that one must be appointed if this was not the case;²⁴⁸ there is no reply on file, but presumably Hancock reassured him.

In letters to White and the golf club, McAra summarized his explanation of the occurrence and assured them that there had been 'no danger of a major breakaway'. The escape of water had come 'as a shock and a surprise to those concerned with the dam', giving them 'a salutary

²⁴⁴ L.S. Jones to J.B. McAra, 24 May 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²⁴⁵ F.J. Hancock to J.B. McAra, 31 May 1972, Inspector of Mines, Box 16C, 13/11/E, MC.

²⁴⁶ L.S. Jones to J.B. McAra, 9 June 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²⁴⁷ L.S. Jones to J.B. McAra, 13 June 1972, Inspector of Mines, Box 16C, 13/11/E, MC.

²⁴⁸ J.B. McAra to F.J. Hancock, 20 June 1972, Inspector of Mines, Box 16C, 13/11/E, MC.

lesson'.²⁴⁹ McAra's technical advice to Handcock about how to prevent a repetition required the height of the dam to be maintained, its width kept at 20 feet at the top, and saturation of the sands guarded against:

Any build up of water near the crest of the dam will almost certainly cause this saturation and consequent slumping of the face so that this must be avoided at all costs. There seems to be no information available as to the size-distribution, permeability, moisture content and slump points of the dam materials generally so that it is not possible to establish it's cohesiveness, strength and stability accurately.

I think it is necessary to determine these facts so that as the pond gets higher with the raising of the dam it can be demonstrated that there is no possibility of an extensive slump and the limit to which the pond can be extended towards the front or crest of the dam can be determined....

Your undertaking to apply much closer supervision and control of the depositing of the tailings by enforcing half hourly inspection of the sand-cone discharge should obviate the formation of water pockets near the front of the dam and as I cannot see that it would cause any inconvenience I should be pleased to have your further undertaking as early as possible that the pond will not be allowed at any time to approach within 100ft of the front or crest of the dam.

If the tests mentioned show that the requisite physical conditions exist for the construction of a safe tailings dam I am hopeful that it may not be necessary to impose further restrictions on it's operation.²⁵⁰

Handcock's response, if any, has not survived. He informed the directors that two new dam sites had been investigated and that preliminary drawings had been discussed with McAra, whose suggestions were being incorporated in a final drawing to be submitted to the catchment board and borough council for approval.²⁵¹ After suggesting improvements for the new dam 350 feet downstream of the existing one, McAra warned that it must be managed well, for, 'as we have seen, critical conditions can arise through inadequate control of the deposition of tailings'. It was

²⁴⁹ J.B. McAra to Town Clerk, 1 June 1971; J.B. McAra to K.C. McGirr, 2 June 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²⁵⁰ J.B. McAra to F.J. Handcock, 25 May 1971, Norpac Papers held by Inspector of Mines, Box 16D, ML 4/70, Royalty Details file, MC.

²⁵¹ F.J. Handcock, Report 6/6 for period ending 12 June 1971, Norpac Papers, Box 6, NMC 19/6, MC.

especially important to confine the pond within the impermeable section and to install seepage pipes to prevent any build-up of water beneath the tailings.²⁵² To Jones, McAra explained that Handcock expected the dam could be 40 feet high and stepped like a pyramid. Norpac had done 'considerable research' into tailings dam construction, and Haszard had studied them in Japan. A particular difficulty was to find an engineer in New Zealand with 'the necessary experience in this work to advise'.²⁵³ Jones replied that the main requirement was good drainage, because once a 'slime-sand mixture' had drained it was 'very difficult to re-mobilise', being 'comparatively impermeable'.²⁵⁴ In June, Handcock told his directors that the council now said it 'did not appreciate the magnitude of tailings involved'.

I suggested that the use of all further tailings off the hill - to fill in swamp areas within the Borough - was very much in the Council's hands. Suggested transfer of tailings by pipeline was economically out of the question, but transfer by water in Tunakohoia Creek to stilling basins near N[ew] Z[ealand] R[ailways] embankments was feasible and relatively cheap and that Norpac would be prepared to assist to the extent of say six cents per ton of tailings for the right to discharge to the Tunakohoia Creek.²⁵⁵

The following month, Handcock informed the directors that the council would prefer that the tailings be taken down to the flat. They confirmed Handcock's offer to assist the council to pay for constructing stopbanks, but insisted that was the council's responsibility 'to have this action approved by all parties entitled to object to it and that once the tailings were dumped into the stream the matter would become the Borough's responsibility'. As proposals for improved processing being put forward by Britton Research

²⁵² J.B. McAra to F.J. Handcock, 18 June 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²⁵³ J.B. McAra to L.S. Jones, 30 June 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²⁵⁴ L.S. Jones to J.B. McAra, 23 July 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²⁵⁵ F.J. Handcock, Report 6/6 for period ending 12 June 1971, Norpac Papers, Box 6, NMC 19/6, UA.

Ltd would mean finer grinding of ore and hence an increase in slimes, 'it would be much better that these should be dumped in the creek'.²⁵⁶

The council was in no mood to make a hasty decision to turn the Tunakohoia Stream into a sludge channel. Its Works and Town Planning Committee resolved that it would not consider this proposal until there had been a 'very full feasibility study' carried out by Norpac and distributed to all the authorities concerned. The offer to supply coarse sand tailings at 15 cents per cubic yard plus metal chips at \$1 per cubic yard was declined until it had investigated their suitability.²⁵⁷

Finer grinding began in July, and while this meant that more of the minerals were recovered, it had other consequences in the pond: 'Wind action was agitating the surface of the pond and preventing the fines from settling. This caused problems in decanting the water'.²⁵⁸ Also during that month there was controversy over the blockage of culverts where the road crossed the north branch of the Tunakohoia Stream, caused by nine inches of rain falling during 24 hours on 2-3 July.²⁵⁹ Lynam, who had complained, was joined by representatives of Norpac and the catchment board, plus McAra, at the site on 5 and 12 July. Mining debris had blocked several culverts, resulting in water scouring the road surface. Lynam complained that three times in the last five years these blockages had occurred, and argued that Norpac should at least contribute to the cost of clearing them. Griffiths told Harris that three of the conditions on Norpac's license had not been met: there was no bypass for the run-off, there was no retaining structure to prevent material entering the stream, and the condition that 'no mining wastes, tailings or debris' be 'discharged into any water course either directly or indirectly was clearly NOT adhered to'. Handcock assured them that he would construct a gabion retaining structure, but did not offer to help meet the NZBC's costs of clearing the blockages.²⁶⁰ One day after

²⁵⁶ Minutes of 35th Meeting of New Zealand Directors of 2 July 1971, Norpac Papers, Box 9, UA.

²⁵⁷ Report of a Meeting of the Works and Town Planning Committee of 13 July 1971, Te Aroha Borough Council: Minute Book 1969-1971, pp. 901-902, Matamata-Piako District Council Archives, Te Aroha.

²⁵⁸ Minutes of 36th Meeting of Directors of 11 August 1971, Norpac Papers, Box 9, UA.

²⁵⁹ J.B. McAra to Under-Secretary, Mines Department, 12 July 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²⁶⁰ David Griffiths, Memorandum entitled 'Norpac Mining - Blocked Culverts on T.V. Rd. Mt. Te Aroha', 12 July 1971, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

this memorandum was written, another was drafted for the board, presumably by Harris, summarizing the position and stating it was ‘obvious that Norpac have been blatantly disregarding the conditions’. After suggesting that the Soil Conservation Committee inspect the area and a letter sent insisting that conditions be adhered to, he raised the concern that the pond was ‘increasing rapidly in size and could pose a real threat to any body on the face down stream’. Would the gabions being built hold, and might not the tailings become saturated and flow down the stream? He recommended that Norpac and the Mines Department be asked to request the carrying out of stability tests, and suggested a better method of building the gabions.²⁶¹

After inspecting the slip on 7 July, McAra reported to his department that some thousands of tons of mullock from the dumps outside mine levels 4 and 5 had been washed down, ‘contrary to the provisions of the license’.

I endeavoured to obtain agreement between the parties as to remedying the situation but pointed out that it was the function of the Warden’s Court to deal with such disputes.

While the conditions of the license require that no material be deposited in any water course it was not in my opinion feasible to carry this out to the letter and only “reasonable” control could be obtained when mining in steep high country subject to such heavy falls of rain.

Mr Handcock eventually reached some agreement with the Catchment Board representatives and will carry gabions up to the downstream end of the No. 5 dump. The N.Z.B.C. is still apparently not satisfied.

He thought that Norpac should do more to prevent the dumps moving,²⁶² though apparently did not say this to Handcock. (In December, he was to tell Handcock that, as the gabions were not being built in the manner agreed, they would not prevent mullock entering the stream in heavy rain.)²⁶³ He told those upset with Norpac that

I hoped that they would be able to come to an understanding, bearing in mind that the infant mining industry had many

²⁶¹ Draft memorandum, 13 July 1971, HCB, Series 2, Box 33, Te Aroha General, VIS4-5, vol. 5, WRC.

²⁶² J.B. McAra, report for July 1971, Inspector of Mines, Box 16B, 13/11/D, vol. 2, MC.

²⁶³ J.B. McAra to F.J.Handcock, 20 December 1971, Inspector of Mines, Box 16C, 13/11/E, MC.

difficulties to overcome and as it might one day provide a substantial contribution to the economy, it should receive whatever encouragement was possible, although it was realized that it must as a general principle bear its own burdens and should not seek to impose them on other sections of the community.²⁶⁴

During August Handcock started preparing the No. 2 tailings area, warning Feasey that this would cause some discolouration of the water.²⁶⁵ When board members inspected the storm damage and gabions in mid-August, he assured them he appreciated their visit, thanked them for their interest, and gave details of the improved gabion structure being constructed. He emphasized that the gabions already in place had withstood the storm of 2-3 July.²⁶⁶

In October, after the Soil Conservation and River Control Council inspected the Tui area, its director, A.W. Gibson, reported to Harris that 'passing observations were made' that 'some of the works appeared to leave much to be desired'. He asked whether the board was satisfied or whether the provisions of the Mining Act were 'taking precedence in control'.²⁶⁷ After discussions between Harris and Gibson and a review by the board, Harris replied noting that the requested information concerning its responsibilities over the stability of the pond had not been received. He summarized developments and enclosed copies of letters and memoranda.

As discussed this is obviously a difficult subject for a catchment authority with few precedents to act as a guide. A catchment authority is naturally reluctant to "get in the way" of mining as it were, but nevertheless has certain statutory functions in terms of the Act under which it is created....

In retrospect, no doubt, there are various aspects which could have been differently and perhaps better handled. The cost of remedial measures which (say) could otherwise be avoided and always likely to create problems in arriving at some satisfactory compromise.

²⁶⁴ J.B. McAra to Under-Secretary, Mines Department, 12 July 1971, Inspector of Mines, Box 16C, 13/11/E, vol. 1, MC.

²⁶⁵ F.J. Handcock to I.E. Feasey, 10 August 1971, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

²⁶⁶ F.J. Handcock to Secretary, Hauraki Catchment Board, 27 August 1971, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

²⁶⁷ A.W. Gibson (Director of Water and Soil Conservation) to R.W. Harris, 15 October 1971, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

In short, conservation in connection with mining can cost money which in turn might understandably be held to affect the viability of a particular mining operation, although the Board, of course, has no way of determining this aspect.

However, in the presence of all these unresolved matters it remains as a fact, that the Board, at any rate, has no way of knowing whether the heap is, or is not stable, or if it is stable now, whether it will remain stable, regardless of eventual size or any other future developments.

As Board cannot but be aware of the existence of the growing tailings heap, at the very least, it must satisfy itself as to its present and future responsibilities (if any) in the matter.

Your comments on the situation would therefore be much appreciated.²⁶⁸

The reply, not received until April the following year, noted that 'in the case of stockpiled waste, the degree of potential damage' was 'high compared with other forms of pollution and precautions taken should be conservative'. As the conditions on Norpac's license appeared to be inadequate, the board was encouraged to check the stability of the tailings 'and if necessary convey its concern to the Secretary for Mines. An estimate of the damage likely to the river system in the event of a slip' might be 'useful'.²⁶⁹

1972

Mining slowed in 1972, caused largely by another form of pollution, mercury, as explained below. While this was of most concern to Norpac, it still had to defend itself from continued criticism over pollution. At least the dam wall proved that it had been well-constructed: a severe earthquake in January did not affect it.²⁷⁰ But there was another complaint from the NZBC to the Mines Department about mine waste blocking culverts and causing damage to the mountain road; Norpac was believed to be depositing

²⁶⁸ R.W. Harris to A.W. Gibson, 30 November 1971, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

²⁶⁹ N.W. Collins (for A.W. Gibson) to R.W. Harris, 8 April 1972, HCB, Series 2, Box 205, 7/2, vol. 1, WRC.

²⁷⁰ F.J. Handcock, Report 1/7 for period ending 22 January 1972, Norpac Papers, Box 6, NMC 19/8, UA.

mullock into the watercourse.²⁷¹ No action seems to have been taken over this complaint.

In February the board agreed to spend \$11,000 of the \$60,510 expenditure approved for the year on the No. 2 tailings area to cope with increased production. Charles Taylor, a civil engineer, approved the specifications of the proposed dam.²⁷² He visited in March and had discussions with Haszard, Sakai, and Handcock; Sakai's design for area No. 1 was in general repeated in the design of the second area, 'with refinements such as the coning of sand'. C. Papanidils, an Auckland civil engineer, had prepared the detailed plans for Tailings Area No. 2, which were revised to include features suggested by McAra. After spending ten days inspecting the design and working of the mill and pond, Sakai told Norpac, so Handcock told McAra, that 'the operation of tailings disposal ... was also extremely smooth, with no fear of pollution'.²⁷³ Handcock began 'practical work on establishing grass coverage on prepared tailings surfaces ... to take advantage of the autumn seeding season';²⁷⁴ as he made no further mention of this trial, it must be assumed to have been a failure.

When a flood took pollutants from the lowest level of the mine down the Tunakohoia North Stream in April, letters were exchanged with McAra, Handcock as usual insisting that Norpac was doing all that was required. However he did intend to take a trip to Australia, subsidized by the company, to investigate tailings disposal by mining companies there.²⁷⁵

On 11 May, McAra inspected the extension to the dam and suggested that Handcock take out a dam license, 'but he was averse to this'. McAra's reasoning was that

²⁷¹ B.L. Darby (of NZBC) to L.S. Jones, 26 January 1972, Inspector of Mines, Box 16A, 13/11, vol. 4, MC.

²⁷² Minutes of 39th Meeting of Directors of 29 February 1972, Norpac Papers, Box 9, UA.

²⁷³ F.J. Handcock, Report 3/7 for period ending 18 March 1972, Norpac Papers, Box 6, NMC 19/8, UA; F.J. Handcock to J.B.McAra, 21 June 1972, Inspector of Mines, Box 16A, 13/11, vol. 4, MC.

²⁷⁴ F.J. Handcock, Report 3/7 for period ending 18 March 1972, Norpac Papers, Box 6, NMC 19/8, UA.

²⁷⁵ Minutes of 40th Meeting of Directors of 20 April 1972, Norpac Papers, Box 9; F.J. Handcock, Report 5/7 for period ending 13 May 1972, Norpac Papers, Box 6, NMC 19/8, UA.

the purpose of a dam license is to ensure that any depository of water will be constructed in such a manner that no danger will arise and in view of certain complaints and criticisms regarding these tailings dams such a license would indicate that the criteria required by Regulations 41-44 would be met.

Also under the terms of the license for a Special Site for the deposit of tailings the Minister of Mines ... is responsible to see that the terms and conditions of the license including those relating to the deposit of tailings in such a manner as not to be a nuisance or danger, are carried out.

In view of this responsibility it seems reasonable that the Company should be called upon to operate under a Dam License and thus provide some assurance that the work will be carried out in accordance with the appropriate Regulations.

In general the work of constructing the No. 2 tailings area is following the plan provided by C. Papandils, Reg. Engineer ... in June 1971. However, in the vicinity of road elevation 1128 seepage drains below the bottom of the clay dam are not working efficiently and there is an accumulation of 5ft depth of water over a narrow width upstream from the dam. I understand that this situation will be remedied and that sub-surface seepage drains will be installed to provide drainage for the whole of the proposed tailings area.

The construction work does not appear to be under the supervision of the Engineer responsible for the plan....

If a Dam License is not taken out I think the construction of the dam should be under the supervision of a registered engineer whose name should be furnished to this office.

Mr Handcock had indicated that he would like to have a fuller discussion before the requirement for a dam license is imposed.²⁷⁶

The day after his inspection, McAra informed Handcock that the foundations for the extension of the dam appeared 'to be impermeable and that an accumulation of water against the dam face several feet deep' had occurred.

As this will probably cause saturation to the foundations of the crest of the new dam it seems to be in contradiction to the discussed policy of maintaining free drainage under the dam and as there would appear to be a possibility of instability of the foundations developing at a later date with the attendant danger of slipping, in the absence of other information I am concerned at this condition.

²⁷⁶ J.B. McAra, Report for May 1972, Inspector of Mines, Box 16C, 13/11/E, MC.

He concluded by expressing his concern at the lack of a dam license and asked for details of any modifications that were made to the dam.²⁷⁷ Jones, who received a copy of this letter, considered the question of the license 'very valid' and asked to be told Handcock's reply.²⁷⁸ McAra responded that he had since had 'some discussion' with Handcock 'on the design and construction of these dams' and was not satisfied that they were 'under sufficiently rigid control'. He wanted 'a more definite responsibility for correct design and construction placed upon the company', preferably by appointing a registered engineer to supervise the design and construction of the foundations, and sought Jones' guidance on how best to control the construction of the dam.²⁷⁹

Also in May the National Water and Soil Conservation Organisation asked the catchment board to inspect the pond because it considered the dam inadequate. The board replied that 'any real check on the stability of the stock-pile waste' was 'a complex matter requiring a full professional investigation with laboratory back-up', which it could not afford. At its meeting, the District Commissioner of Works, Reginald Ernest Hermans,²⁸⁰ 'commented that the onus to investigate safeguards should be on the private individual or enterprise and should not involve the Board in the expenditure of public money'. The board agreed to his suggestion that the Mines Department be asked to investigate.²⁸¹

Norpac prepared to pipe water for disposal in the Tunakohoia North Stream, should it receive permission; its second dam was not yet in use. When the board asked that both dams be investigated, the directors responded that, as their engineers had approved them, they had 'done everything possible to be assured of the best construction'.²⁸² The board remained unconvinced, and in June Harris wrote to the Secretary of Mines expressing its deep concern 'at the situation, size and potential danger' posed by the tailings. After summarizing the dimensions of the problem and the effects of them slipping down the mountain as a type of lahar, as in a

²⁷⁷ J.B. McAra to F.J. Handcock, 12 May 1972, Inspector of Mines, Box 16C, 13/11/E, MC.

²⁷⁸ L.S. Jones to J.B. McAra, 31 May 1972, Inspector of Mines, Box 16C, 13/11/E, MC.

²⁷⁹ J.B. McAra to L.S. Jones, 6 June 1972, Inspector of Mines, Box 16C, 13/11/E, MC.

²⁸⁰ *Hamilton East Electoral Roll, 1972*, p. 138.

²⁸¹ F.J. Handcock, Report 5/7 for period ending 13 May 1972, Norpac Papers, Box 6, NMC 19/8, UA; *Te Aroha News*, 16 May 1972, p. 14.

²⁸² F.J. Handcock, Report 6/7 for period ending 10 June 1972, Norpac Papers, Box 6, NMC 19/8; Minutes of 41st Meeting of Directors of 14 June 1972, Norpac Papers, Box 9, UA.

recent disaster at the Welsh mining village of Aberfan, the board requested assurances before its July meeting

- (1) That proper engineering steps have been taken to determine the stability of the heap, and
- (2) That your department has acceptable assurances from a Professionally qualified and recognised Authority that the heap is in fact stable and safe, both for the present and for the future.²⁸³

The reply, written by Jones in late August, noted that McAra had, with the board, inspected the 1971 flood damage:

It is significant that there was no appreciable damage to the tailings area during the two quite unusually severe storms which caused damage to the mullock heaps and consequent blockage of the road culvert on the NZBC road. The Inspector is aware of the dangers inherent in the storage of mill tailings on a hillside site and would welcome engineering opinion from both the Board and the Ministry of Works.

In conclusion it appears to Mines Department that the engineering concepts used i.e. the preparation and drainage of foundation areas, the lack of depth of ponded water, the fact that the material is of the same grain size and close attention to maximum height and batter to obviate slump through gravity - are all being considered.

Aberfan had no site preparation, no attention to foundation drainage, no attention to maximum height and batter and worst of all was a waste pile of a mixture of coarse rock and fine slack and other material.

The company and the Department are as interested as the Board in preventing any major outflow of material from these mill tailings and would welcome the cooperation of the Board's engineers in making any such contingency impossible.²⁸⁴

This, Handcock told his directors, was 'a very good reply'.²⁸⁵ It was based on a report from McAra explaining the operation of the pond and stating that, if worked properly, there was no danger. He did have one qualification:

²⁸³ R.W. Harris to Secretary of Mines, 23 June 1972, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

²⁸⁴ L.S. Jones (for Secretary of Mines) to R.W. Harris, 23 August 1972, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

²⁸⁵ Minutes of 43rd Meeting of Directors of 21 September 1972, Norpac Papers, Box 9, UA.

The volume of water in the pond is about 400 - 500 tons. In constructing the foundation for the breastwork for the tailings dam extension, the soil drains through and on either side of the breast-work appear to be inadequate and some water has accumulated at an estimated depth of 3ft. So long as the soil drains are functioning properly and the material used in building the crest or westerly end of the dam is the permeable coarse fraction from the sand spigot, and the overflow of fine material is deposited evenly by gravitating down a gentle slope to the syphon controlled pond at the easterly end of the tailings dump, there should be no occasion for concern particularly as the area is naturally protected from the possible effects of storm water.²⁸⁶

When Harris told Jones that he needed the details of the engineering design and of previous investigations of the pond and dam before he could give full consideration to the issues raised, he was told to discuss the issues with Norpac and McAra.²⁸⁷ Handcock had offered Harris the drawings of the dam to show to his board in 1971, but Harris had declined this offer because, according to Handcock, he did not feel competent to comment.²⁸⁸ What Harris continued to seek were assurances from an independent civil engineer with more specialist knowledge than himself. At its December meeting the board resolved that the stability should be investigated, and offered to arrange for the appointment of a suitable expert if the Water and Soil Division of the Ministry of Works would meet the cost.²⁸⁹ Harris also made the same offer to the National Water and Soil Conservation Organisation. The latter's cautious response was that first there needed to be an estimate of cost, clarification of the legal right to enter Norpac's land, and an indication of the action the board anticipated taking if investigations showed the pond to be potentially dangerous.²⁹⁰

²⁸⁶ J.B. McAra, Report for August 1972, p. 7, Inspector of Mines, Monthly Reports 1972-1973, BACB A654/106, ANZ-A.

²⁸⁷ R.W. Harris to Secretary of Mines, 29 September 1972; L.S. Jones to R.W. Harris, 27 October 1972, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

²⁸⁸ F.J. Handcock, Report 9/6 for period ending 4 September 1971, Norpac Papers, Box 6, NMC 19/6, UA.

²⁸⁹ David Griffiths to Director, Water and Soil Division, Ministry of Works, 19 December 1972, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

²⁹⁰ D.J. Bagnall (for A.W. Gibson) to R.W. Harris, 9 January 1973, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

When sending Pentland copies of correspondence and press reports to illustrate 'the activity that the pollution people' were showing, Handcock wrote that when Norpac's management heard of the board's approach to the Mines Department they expected 'any investigation of tailings disposal being based on a mining point of view and not on an exclusive soil mechanics coverage and of course within the provisions of the Mining Act only'. Reading of the First International Tailings Symposium to be held in Tucson, Arizona, in November, 'we considered there would be value in establishing between ourselves, Mines Department and the Pollution Control Authority a standard for the stowage of mill tailings based on mining practice', and suggested to the department that one of its officials attend.²⁹¹ Norpac sent Haszard, whose report noted that, while environmentalists were forcing expensive pollution controls, the industry 'in some respects' had 'brought this upon themselves by blatant pollution by tailings and smelter gases'. His quick tour of American mining regions and smelters had quite shocked him. At the symposium he had discussed the type of dam Norpac had built and was told that the greatest danger was sand or slime in liquefaction because of over-topping or over-filling when the water level was against the berm or dyke. This situation would cause saturation of the dam and its subsequent failure, especially if there was seismic activity. Therefore there should be 'as much free board as possible' in the ponding area, with water kept at a minimum and 'as much "beach" as possible'. The dam and tailings must be monitored for unusual phenomena, especially seepage; any weak points found in the dam must be reinforced. It was considered that their methods were 'as safe as can be expected'.²⁹²

MERCURY

Cinnabar, the natural form of mercury, was found by early prospectors of the Tui area.²⁹³ An 1887 report on the newly exposed lodes noted that in the galena there were 'a good many patches of cinnabar - too small,

²⁹¹ F.J. Handcock to A.G. Pentland, 12 September 1972, Norpac Papers held by Inspector of Mines, Box 16D, A.G. Pentland file, MC; F.J. Handcock, Report 10/7 for period ending 30 September 1972, Norpac Papers, Box 6, NMC 19/8, UA.

²⁹² Dave Haszard, 'Report on visit to International Tailings Symposium at Tucson, Arizona, 31 October 1972 - 3 November 1972', 4 December 1972, Norpac Papers, Box 1, NMC 38, UA.

²⁹³ *Te Aroha News*, 14 April 1898, p. 2.

however, to be of any practical value'.²⁹⁴ A geological survey published in 1913 reported that the Tui ore carried 'a little cinnabar'.²⁹⁵ Norpac made no mention of this in its reports, although cadmium was mentioned in 1965 as a useful mineral that had been found.²⁹⁶ The implications of these heavy metals being part of the concentrates sent to Japan for smelting became apparent in September 1971, when Mitsui informed Norpac about the sharp increases in their production costs:

Environment pollution problems in particular have severely affected the non-ferrous metals industry in Japan through the most severe emission standards required for cadmium and other heavy metals, as well as SO₂ gas, in the world.

The Anti-Pollution Fundamental Law accompanied by the Anti-Air Pollution Law, Prevention of Water Pollution Law and Prevention of Soil Pollution in Farm Lands Law were enacted and put into enforcement as from June 24th this year. These laws set up extremely severe emission standards for cadmium and other heavy metals in the smoke and water discharged from smelters, and soils in neighbourhood....

Japanese zinc smelters will be ordered to improve and/or install facilities at the plants to meet these regulations if any such standard has been exceeded. Any violation will be severely penalized.

In fact, even before introduction of these laws, strong denouncement by inhabitants around smelters and administrative order by the Government forced some of Japanese zinc smelters to curtail their production.

Because of the 'huge amount' of extra expenditure needed to meet the new requirements, Norpac was asked by Mitsui to agree to 'a reduction of about US\$7.00 per dry metric ton of concentrates, as a contribution on the part of mine for a part of extra costs of anti-pollution expenditures at smelters'.²⁹⁷ Another letter of the same date asked Norpac to accept a

²⁹⁴ J.A. Pond, in *AJHR*, 1887, C-5, p. 59; see also Professor James Black in *The Handbook of New Zealand Mines* (Wellington, 1887), p. 293.

²⁹⁵ John Henderson, assisted by John Arthur Bartrum, *The Geology of the Aroha Subdivision, Hauraki, New Zealand* (Wellington, 1913), p. 118.

²⁹⁶ *Te Aroha News*, 7 December 1965, p. 1.

²⁹⁷ S. Shimoda (Assistant General Manager, Non-Ferrous Ores Department, Mitsui & Co., Ltd) to Norpac Mining Limited, 13 September 1971, Norpac Papers, Nakakita file, Union Hill.

reduction of US\$4.00 per dry metric ton of lead concentrates, for the same reasons.²⁹⁸

Norpac's directors resolved that 'While the Company was sympathetic to Mitsui ... it was felt that in view of Norpac's present financial position the Company was unable to reconsider the terms of the contract which had been entered into with Mitsui'.²⁹⁹ Ernest Kenneth Haddy, the company's secretary, in conveying this decision, wrote that Norpac had also faced 'relatively substantial cost in pollution control'. It had not solved all its metallurgical problems, inflation had increased the costs of labour and other expenses alarmingly, world metal prices had fallen, and Mitsui's request could force operations to cease if Norpac was unable to improve its 'metal recoveries'.³⁰⁰ As Norpac refused to agree to a lower price Mitsui decided not to renew their contract to purchase concentrates beyond the expiry date of 31 December 1972.³⁰¹ Another justification for the non-renewal was that assays of some shipments revealed a mercury percentage higher than the Japanese new anti-pollution regulations permitted.³⁰² The general manager of an Australian mining company found this latter reason puzzling, because 'the small tonnages involved could have easily been absorbed along with their other purchases and their production in Japan'. He understood that Japanese Kuroko lead-zinc mines, 'the same age as those mined at Tui', had 'a substantial mercury content'.³⁰³

A letter to Handcock from the local Member of Parliament, John Luxton, upon the latter's return from Japan explained the Japanese view very clearly:

²⁹⁸ S. Shimoda to Norpac Mining Limited, 13 September 1971, Norpac Papers, Nakakita file, Union Hill.

²⁹⁹ Minutes of 37th Meeting of Directors of 19 October 1971, Norpac Papers, Box 5, File 19, UA.

³⁰⁰ E.K. Haddy (Secretary, Norpac Mining Ltd) to S. Shimoda, 21 October 1971, Norpac Papers, Nakakita file, Union Hill.

³⁰¹ Minutes of 44th Meeting of Directors held on 15 November 1972, Norpac Papers, Box 9, UA.

³⁰² A.F. Downer to John Ivanac (Central Pacific Minerals NL (Australia)), 9 February 1973, Norpac Papers held by Inspector of Mines, Box 16D, Central Pacific Minerals file, MC.

³⁰³ John Ivanac to A.F. Downer, 8 February 1973, Norpac Papers held by Inspector of Mines, Box 16D, Central Pacific Minerals file, MC.

Everyone is very pollution-conscious and every day during our visit mercury pollution seemed to be a feature in the news.

From discussions, it would appear that Japan is investing money outside the country for smelter operations rather than face up to the stringent requirements that are being demanded and likely to be required in the future. In my discussions I was not encouraged to believe that the position would become easier for Norpac, rather it would become much more difficult and the standards required for Norpac would become punitive.³⁰⁴

Because the Japanese government prohibited the import of concentrates containing mercury and there were no smelters operating on the west coast of the U.S.A. and Canada, the Tui mine became uneconomic.³⁰⁵ To prevent its closure, government assistance enabled Norpac to continue mining in a small way while another market was found and a method was found to reduce the mercury level. Areas of low mercury content were identified in the mine, but Downer told the Development Finance Corporation in July 1973 that 'all enquiries into the methods of reduction of mercury in the concentrates at mill site would indicate a substantial cost factor, and the creation of an air pollution problem'.³⁰⁶ The Department of Scientific and Industrial Research researched ways to reduce the mercury content, for Mitsui was willing to purchase a zinc concentrate provided mercury did not exceed ten parts per million.³⁰⁷ In October, the DSIR reported some successful experiments, but warned of the cost; Jones also worried that with the proposed system of lowering the mercury content 'the disposal of wash water could shift some of the pollution problem to New Zealand instead of Japan'.³⁰⁸ For Norpac the fundamental issue was cost: Haszard was reportedly 'not over-enthusiastic because of company's

³⁰⁴ J.F. Luxton to F.J. Handcock ['Dear Frank'], 14 June 1973, Norpac Papers, Box 4, NMC 34, UA.

³⁰⁵ Roger Dewhurst to R.W. Harris, Memorandum entitled 'History of Tui Mine and Tailings Dam', 26 October 1978, HCB, Series 1, Box 206, 2/7, vol. 2, WRC.

³⁰⁶ A.F. Downer to 'Mr Chatten', Development Finance Corporation, Wellington, 17 July 1973, Norpac Papers, Box 2, NMC 43, UA.

³⁰⁷ John Abatamatto to F.J. Handcock, 6 August 1973, Norpac Papers, Box 2, NMC 43; Minutes of a Special Meeting of Directors held on 9 August 1973, Norpac Papers, Box 9, UA.

³⁰⁸ A.J. Ellis (Director, DSIR) to F.J. Handcock, 8 October 1973, Inspector of Mines, Box 16A, 13/11, vol. 4, MC.

precarious situation - thought it would be foolish to install any further plant'.³⁰⁹

After nearly a year of experimentation on the mercury problem, the government in November appointed Ian Sommerville as receiver/manager of Norpac. This was explained by the Minister of Mines, Fraser Colman, as being another 'holding phase' while he awaited Mitsui's testing of the DSIR's pilot studies on mercury contamination.³¹⁰ Downer explained to the main overseas director that all Norpac's efforts had been focussed on making a concentrate acceptable to Mitsui, and although 'some progress' had been made by the DSIR, mercury levels had not been reduced to that required by Japan. He expected the Receiver to continue the quest for a solution to the problem.³¹¹ An accompanying press cutting quoted the deputy director of the DSIR's Chemistry Division as saying that their laboratory tests and field experiments at the mine with a chemical leaching process looked 'interesting' but there was 'a fair way to go with it'.³¹² This newspaper report indicated that overseas smelting companies in general, not just in Japan, were not prepared to pay the going market price for a product that required 'intensive refining'. Having to construct expensive new plants to conform to new anti-pollution regulations, they had 'become more selective in their purchasing'.³¹³

The receiver did investigate the mercury issue further. Although Mitsui might purchase concentrates if mercury was at a maximum of 10 p.p.m., the DSIR told him that 'even after leeching the mercury content was not falling as low at 10 p.p.m. and due to the extremely volatile nature of mercury it was difficult to give any guarantees with respect to the mercury

³⁰⁹ A.G. Palmer to L.S. Jones, 18 October 1973, Inspector of Mines, Box 16A, 13/11, vol. 4, MC.

³¹⁰ F.M. Colman, Press Release: 'Uncertain Future for Tui Mine', 20 November 1973, Norpac Papers, Box 2, NMC 43, UA.

³¹¹ A.F. Downer to Benjamin H. Swig, 26 November 1973, Norpac Papers, Box 2, NMC 43, UA.

³¹² Terry McGrath, 'State Holds Key to Fate of Te Aroha Mine', *New Zealand Herald*, 21 November 1973, Section 3, p. 3.

³¹³ Terry McGrath, 'State Holds Key to Fate of Te Aroha Mine', *New Zealand Herald*, 21 November 1973, Section 3, p. 3.

content'.³¹⁴ This ended any hope of a deal with Mitsui, and as no other company would buy the mine, it closed.

AFTER NORPAC: 1973 TO 1980

1973

Some Te Aroha residents regretted the closure of the mine, for economic reasons. The Chamber of Commerce and several shopkeepers expressed concern at the loss of income to the community, and Skidmore hoped another company would buy the concentrates and so ensure the continuance of mining.³¹⁵ Others were more concerned with the environmental consequences. Lynam, who passed the pond regularly, wanted it cleaned up before all mining ended, as the conditions on the license required. He managed to get the television programme *This Day* to cover the issue; it suggesting the pond was a potential danger to life and property, especially if left unattended once mining ceased.³¹⁶ This prompted the *Te Aroha News* to ask whether there was a real environmental problem and to call for the allaying of fears, which it implied were exaggerated. Apart from anything else, mining and treatment was subject to conditions and there were regular inspections by Mines Department officials; was it feasible 'that if Norpac was deliberately and flagrantly committing breaches of legal requirements that operations would have been permitted to continue?' Skidmore was quoted as assuring the populace that their lives and property were not in jeopardy, as illustrated by the fact that the torrential rainfall at the end of November 1972 had not caused either the ore stockpile or the tailings pond to slip.³¹⁷ Allen George Palmer,³¹⁸ who had replaced McAra as Inspector of Mines, privately dismissed Lynam's views and accused him of 'trying to kick Norpac when it was down', while Lynam's superior officer wrote asking if he was 'crying wolf'.³¹⁹

³¹⁴ Norpac Mining Limited (In Receivership), 'Receiver's Confidential Report to Debenture Holders and Directors', 21 February 1974, Norpac Papers, Box 3, NMC 11, UA.

³¹⁵ *Te Aroha News*, 31 January 1973, p. 1.

³¹⁶ Interview with J.H. Lynam, Te Aroha, 1 July 1995; *Te Aroha News*, 15 February 1973, p. 1.

³¹⁷ *Te Aroha News*, 15 February 1973, pp. 1, 10.

³¹⁸ *Hamilton East Electoral Roll, 1978*, p. 87.

³¹⁹ Interview with J.H. Lynam, Te Aroha, 1 July 1995.

The follow-up article was not quite so reassuring. Harris was quoted as telling the catchment board that determining the safety of the stockpile was an 'urgent necessity'. Because of 'previous experiences and seeming complete lack of jurisdiction', board members asked for their powers to be clarified to permit them to act effectively. 'Without the co-operation of the mine operators it would be a lengthy legal process to even gain entry to conduct a survey'. The warden imposed the conditions sought by the board were imposed only in 1966; subsequent licenses granted in 1968 and 1969 did not include these. Believing that the Mining Act of 1926 over-ruled the Soil Conservation and Rivers Control Act of 1941, they felt that they had 'some responsibility in the matter but insufficient powers to exercise it'.³²⁰ One member said that the board was 'in the hot seat and it is not our place', while another said they had 'no real power'. Harris repeated that since 1968 they had been seeking to clarify their legal powers.³²¹ Another member commented that 'all the conditions reasonably required by a Catchment Authority or a Regional Water Board might make the operation of an efficient mining enterprise well nigh impossible'.³²² The board resolved to approach Norpac to inquire if any investigations of the safety of the tailings had been carried out. Should this not be the case, Norpac would be asked to approve their inspecting the site 'solely with a view of estimating the cost of an investigation into the stability and safety of the structure', after which a decision would be made into any necessary action. A resolution was carried:

In view of Board's previous experiences and seemingly lack of jurisdiction that the National authority be advised that the Board cannot take any further action in respect of the Norpac Mine situation until such time as board's present position and responsibilities are clarified, and if Board is required to accept responsibility authority be given to Board to adequately lay down and enforce reasonable requirements to ensure the safety of this type of operation, and enforce such requirements.³²³

³²⁰ *Te Aroha News*, 20 February 1973, pp. 1, 7.

³²¹ *New Zealand Herald*, 15 February 1973, press cutting in Inspector of Mines, Box 16A, 13/11, vol. 4, MC.

³²² *Te Aroha News*, 20 February 1973, pp. 1, 7.

³²³ G.H. Caddie (Secretary, Hauraki Catchment Board) to Director, National Water and Soil Conservation Organisation, 23 February 1973, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

Handcock countered the expressions of concern by insisting that Norpac had abided by the conditions, adding that 'the proper stowage of tailings' was 'the most important function in the mining field. The Tui Mine staff have made a particular study of the subject, keeping abreast at all times with the latest in world techniques. Visits have been made to Japan, Australia and USA'. The latest visit of Mines Department inspectors a week ago had 'again confirmed the complete acceptance of the methods adopted'.³²⁴ This had been made by Jones, McAra, and the Acting District Inspector of Mines, Gerard Klemick, who had formerly gained his mining experience in Norpac's mine. After their detailed examination of Tailings Area No. 1, Handcock was able to tell his directors that they expressed 'satisfaction' at the methods used 'and the phreatic line attained'.³²⁵

Members of the catchment board also inspected the pond in April, at Handcock's invitation (an invitation that initially excluded their technical staff),³²⁶ and in May the Ministry of Works arranged for Tonkin and Taylor, consulting engineers, to inspect the dam.³²⁷ This was at the request of Colman, who argued that as Norpac's consulting engineer, the mining inspectors, and Jones all said the dam was stable, it was unfair to ask Norpac to pay for another investigation; instead, the government would meet the cost. He wanted a prompt study to end the doubts (raised not only by the catchment board but also by the Soil Conservation and Rivers Control Council and the Water and Soil Division of the Ministry of Works). Colman also commented that Harris was aware of the consulting engineer's report but had 'not availed himself of the opportunity to examine it'.³²⁸ The Mines Department authorised the spending of \$4,000,³²⁹ while both Klimick and Palmer assured Handcock that they felt that the dam was safe. The latter wrote that he considered that the investigation was to confirm that

³²⁴ 'The ABC from Norpac', *Te Aroha News*, 20 February 1973, p. 1.

³²⁵ F.J. Handcock, Report 3/8 for period ending 24 March 1973, Norpac Papers, Box 6, NMC 19/7, UA.

³²⁶ Minutes of the Ordinary Meeting of the Hauraki Catchment Board of 11 April 1973, HCB, Minute Books, vol. 18, p. 307, WRC.

³²⁷ A.G. Summers (for Secretary of Mines) to Inspector of Mines, 14 May 1973, HCB, Series 1, Box 205, 7/2, vol. 1, WRC.

³²⁸ F.M. Colman to Minister of Works, 1 May 1973; A.G. Summers (for Secretary of Mines) to Commissioner of Works, 2 May 1973, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

³²⁹ F.J. Handcock, Report 11/8 for period ending 3 November 1973, Norpac Papers, Box 6, NMC 19/7, UA.

the tailings were safe and would 'not constitute a menace to the environment in the future'.³³⁰ When asked by Harris late in the year whether Norpac had fulfilled the conditions, Palmer simply responded that 'it would be best ... to specify the reasons for concern regarding departures from conditions on title. Investigations can then be carried out to a positive conclusion'.³³¹ Finally, at the end of January 1974, Tonkin and Taylor started drilling to obtain cores from the dam 'for Soil test purposes'.³³²

1974

After government assistance that enabled Norpac to continue mining in a minimal way ended in February 1974, Palmer contacted the borough council and the catchment board to ask whether Norpac had fulfilled the conditions.³³³ The board asked for time to consider the issue because Tonkin and Taylor were still drilling and until they had finished it was not possible to determine this. Harris wrote that, when the mine was in operation, the 'immediate risk' may well have been small and the technical investigation of the pond a 'double check', but its closure lent 'much more emphasis to the investigation'. The board again asked that responsibility for the tailings be determined.³³⁴

In May, Tonkin and Taylor presented their report. It noted that, since tailings had ceased to be deposited in 1973, the phreatic line [relating to ground water occurring below the water table]³³⁵ had dropped within the tailings and that the surface had been 'subject to considerable desiccation'. The crest level of the dam was approximately R.L. 1193 feet, 'compared with a final proposed design height of R.L. 1205ft when full'. There were two small dams downstream of the main dam, the first made from coarse

³³⁰ Gerard Klimick to F.J. Handcock, 17 May 1973; A.G. Palmer to F.J. Handcock, 11 July 1973, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

³³¹ Gerard Klimick (for A.G. Palmer) to F.J. Handcock, 12 November 1973, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

³³² F.J. Handcock, Report 1/9 for period ending January 1974, Norpac Papers, Box 1, NMC 49, UA.

³³³ A.G. Palmer to Town Clerk, 7 February 1974, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

³³⁴ R.W. Harris to G.H. Caddie, Memorandum entitled 'Re Norpac and discussions with R.K. Howard', 16 February 1974; R.W. Harris to A.G. Palmer, 21 February 1974; A.G. Palmer to R.W. Harris, 5 March 1974, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

³³⁵ *Collins English Dictionary*. 4 ed. (Glasgow, 2000), p. 1169.

tailings sand and the second from rock gabions. 'No tailings have been deposited behind either of these two small secondary dams and they will function as effective silt traps, in the short term, for scour from the main dam face'. The tests for stability revealed that

factors of safety, under static conditions, are of the order of 3 with the existing measured phreatic line and even after inundation and assuming the highest likely water levels, the factor of safety drops to just less than 2. The risk of liquefaction of the tailings under earthquake induced shock loading is low under existing low water-table conditions. However, even if liquefaction of the tailings within the pond were induced under high ground-water conditions the low downstream slope of the dam means that sufficient resistance is available to withstand the lateral pressures from full liquification within the pond.

As a result of detailed stability analyses we conclude that the risk of a major catastrophic failure of the tailings dam is low and an adequate factor of safety against overall stability is provided.

The long term performance of the main dam and the return bund on the south side will be influenced by any surface erosion or scouring of the downstream slope which may occur. Although there is a natural cemented crust which forms at the tailings surface this would be broken down by activities such as digging and removal of the surface layer. It is therefore recommended that public access be barred to the downstream face of the dam and bund. A more permanent solution would be to place a clay cover on the downstream faces as indicated in the drawings of the proposed dam when completed to its design height. Planting on the downstream faces at the dam and bund would then provide a permanent long term control of scour. The ponding of water at the eastern end of the tailings area could be a hazard to children, particularly as the tailings are finer and softer in this area. It is recommended that the public be prevented from entering the pond area.

Alternatively a clay cover could be placed over the pond area with provision to prevent ponding of surface runoff water. The surface could then be planted. However, it should be borne in mind that with the increasing world demand for mineral resources, that the mine and mill may be reopened in the future and a scheme including planting or relandscaping of the tailings deposit may not be warranted at this stage.

The report recommended regular maintenance of the contour drain around the northern boundary of the tailings because this diverted surface run-off water, as well as the maintenance of the existing outlet pipes to

drain the pond's surface. They repeated that there was 'an adequate factor of safety against an overall failure of the tailings dam'.³³⁶

Palmer thought the report and its recommendations

present the position fairly. There is no danger from dam subsidence but reopening of the mine and mill would require fresh planning of the tailings disposal area, particularly in regard to the permanent drainage of the sands.

I feel that this dam has been given undue publicity and that the actual menace to society is slight. The full direction of all waters in the catchment area of the same into one course would be unlikely to generate a stream of sufficient power to transport more than token amounts of sand and these would be absorbed in the bed and banks of the present stream before reaching the Borough boundary. I cannot conceive any danger from massive movement of the dam material.

Because vandals and others using the area as a playground assisted the erosion of the sides of the dam, a cover of vegetation was required. Drainage must be directed away; 'the main source of danger' was the spring, which kept 'material in a soft state in its immediate vicinity' but did not threaten 'the stability of the dam as a whole'.³³⁷ Harris instructed the new owner of the site that the insecure cover over a 19-foot deep well on the tailings was a danger to children and must be made safe.³³⁸

When discussions were held between the interested parties at the time Norpac ceased operations, Haszard had 'emphasized the need to maintain the integrity of the confining wall of the tailings dam. This advice was later disregarded and sand was removed from the face'.³³⁹ When on 8 October Klemick inspected the dam at Palmer's request, he reported that material was 'being removed from the forward end of the Dam by Moran Contractors for Race Course fill'. Although this was being excavated from the same area used by Norpac for similar sales, Norpac had continually deposited new

³³⁶ Tonkin and Taylor, 'Stability Study of Norpac Mine Tailings Dam', May 1974, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

³³⁷ A.G. Palmer to L.S. Jones, 8 August 1974, Inspector of Mines, Box 13C, 13/11/E, vol. 2, MC.

³³⁸ R.W. Harris to Julian Barbarich, 14 September 1974, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³³⁹ Roger Dewhurst to R.W. Harris, Memorandum entitled 'History of Tui Mine and Tailings Dam', 26 October 1978, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

sand. The dam walls were ‘not affected so far’.³⁴⁰ As well, the new owners, Mineral Resources (N.Z.) had taken bulk samples to see whether it could sell the whole dam to a concreting firm.³⁴¹ Approximately 2,000 cubic metres of sand were taken from the lower section of the dam, thereby reducing its stability.³⁴² Harris was alarmed that these excavations were made on the toe of the heap, ‘just where the consultants are of the opinion that nothing should be touched for fear of damaging heap stability’.³⁴³ Once he heard the claim that material was being removed from the toe of the dam, Jones asked Palmer to check urgently; if true, extraction must cease immediately, and Mineral Resources must repair the damage.³⁴⁴ Palmer confirmed his earlier instruction to J.P. (Jack) Barbarich, general manager of Mineral Resources, that ‘no further sand may be removed from the face that has been developed towards the toe of the dam’, and if further removal of sand downstream of the toe affected the dam’s stability, all removal was to stop. ‘It is appreciated that the sand is being taken for bulk sampling purposes and that you hope to sell the whole dam to a concrete company’, but approval must be sought before the dam was removed.³⁴⁵

In response to Tonkin and Taylor’s report, Griffiths recommended that the tailings ‘should be covered (by Mines Dept of course) with spray on grass ... and also planted up with pine trees, radiata or contorta to give long term cover & binding. The combination should stabilise the surface quite satisfactorily’.³⁴⁶ The board accepted his recommendations except the use of contorta. Before planting trees it would cover the dam and pond with clay, and wanted the contour drain maintained, public access prohibited until revegetation was complete, and future removal of the heap done in an

³⁴⁰ Gerard Klemick to A.G. Palmer, October 1974, Inspector of Mines, Box 16A, 13/11, vol. 4, MC.

³⁴¹ A.G. Palmer to General Manager, Mineral Resources, 10 October 1974, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

³⁴² Roger Dewhurst to R.W. Harris, Memorandum entitled ‘History of Tui Mine and Tailings Dam’, 26 October 1978, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

³⁴³ R.W. Harris to Director of Water and Soil Conservation, 17 September 1974, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁴⁴ L.S. Jones to A.G. Palmer, 4 October 1974, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁴⁵ A.G. Palmer to J.P. Barbarich (General Manager, Mineral Resources (N.Z.)), 10 October 1974, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁴⁶ David [Griffiths] to ‘Andy’, 23 July 1974, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

acceptable manner. All work should be supervised and certified by a registered civil engineer, and finance provided to meet all costs, including future maintenance.³⁴⁷ Since this work was 'necessitated solely by mining operations, the finance required should come from the mining sector, probably, practically, from the Ministry of Mines', in Harris' opinion. In a long letter to the Director of Water and Soil Conservation, he voiced concerns over the ownership of the mines:

The situation now pertaining highlights some of Board's earlier comments regarding liability for cost of works in the somewhat shaky economic climate prevailing in the mining world.

Regarding the stability report, I do not know if the new owners are familiar with it, or even know of its existence. I feel that the information in the report should be made available urgently to the new owners ...

Board's responsibilities in mining matters are not clear....

The whole situation has been frustrating in the extreme, especially as there is more than a feeling that, while Board's statutory powers appear to be limited, its responsibilities may not be so limited, especially if it could be shown that it had some knowledge of dangers and did not act or say something. In recent years, because of the foregoing, Board has refrained from undue involvement in mining matters, but recently the question of the stability of the tailings heap was thrust upon it, and the consultants engaged for an investigation....

[Mineral Resources' acquiring of some of Norpac's assets] is not unusual in mining operations, but it does underline the weakness and danger of the Board's situation, with limited powers, and possibly no limit on responsibility. I very much fear that much of the earlier frustrating experience with Norpac could now be repeated. Board cannot deal with a mining operation when the operators know very well that Board's statutory powers in this respect are limited.

The position on Mt Te Aroha has already received national publicity on television, with the Board in the unenviable position of being the local authority most directly concerned, and yet unable to make any definite statement. A minor problem has already occurred with the new operators over a small dam, and the Inspector of Mines, Huntly, when approached, stated that Board should deal directly with the mining operator. This involves staff time, and past experience has not been encouraging, either in time expended or in results achieved. Nevertheless, it is being attempted again on this occasion.

³⁴⁷ R.W. Harris to Director of Water and Soil Conservation, 17 September 1974, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

It is, therefore, urgently requested that this matter be reviewed and a clear statement made as to the Board's part in the proceedings, in particular with respect to the tailings heap and associated structures. If this cannot be done, then I feel that I must recommend to board that it consider making a public statement on the whole position, to avoid the situation whereby Board might be held responsible for a development over which it has little or no control.

To some extent, I fear that this situation already pertains.³⁴⁸

The director asked Jones to advise him about how to stabilize the dam and meet the cost, pointing out that the catchment board could not require its ratepayers 'to finance works or maintenance' that were 'part and parcel of the mining operation and which should be a condition of a mining lease'.³⁴⁹ Palmer's advice to Jones about Gibson's letter dealt with all the conditions proposed by the catchment board:

(a) The contour drain should be maintained by the licence holder. When the licence is surrendered, periodic inspection could be arranged by this Department. In effect, the drain is a token gesture only; the little water that accumulates in it would do no harm to the dam if the drain were blocked.

(b) I am against the planting of grass and *pinus radiata* in a clay cover. This seems bad practice because,

(i) impervious clay cover would allow water to accumulate, ultimately to do damage when it finds a weak spot,

(ii) tree roots could produce unstable conditions by providing channels for water movement. It is preferable to allow natural cover to develop.

(c) I agree that public access to the dam area is undesirable, as breaking down the walls could allow erosion to develop, but this is not really of any great moment as there is seldom more than a few inches of water at the upstream end of the dam now that operations have ceased, and then only after rain. Even if decant pipes were blocked, little water would accumulate.

(d) It is possible that the dump will be sold and completely removed from the site. In such a case, I should think we are quite capable of determining how it should be removed. However, the Board has some points to make and their early opinion as to how

³⁴⁸ R.W. Harris to Director of Water and Soil Conservation, 17 September 1974, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

³⁴⁹ A.W. Gibson (Director of Water and Soil Conservation) to Secretary of Mines ('attn: Chief Inspector of Mines'), 1 October 1974, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

this should be done should be requested because the present owners move quickly.

It is noted here that bulk samples were taken and tested by a concrete-block company, and that fine sands are in short supply for this industry.

Regarding the allegation that material was removed from the toe of the dam, I have to report that material has not been removed from the toe of the dam, but from an area in that locality. briefly, sand and slimes were separated by a cyclone at one end of the dam crest and part of the sands was allowed to fall outside the dam. When required, the sand was hauled up the dam face by dragline to heighten the wall. There was naturally an accumulation near the toe of the dam of sand not required for its enlargement and some of this was sold from time to time by the previous owners. Further, to stop this sand getting into the water-course, gabions were erected downstream of the dam at the request of the Catchment Board.

The 'small dam' referred to by Harris was 'about 3 chains downstream of the tailings dam and about 2 chains upstream of a permanent gabion structure'. It had probably been erected during the initial construction to stop sand entering the stream. It held about ten feet of water, and Klemick ordered this released when asked by a board engineer. As the dam no longer served a useful function and 'might be considered dangerous', the board should be asked if it wanted its removal (which he doubted the new owners 'would be glad to pay for').³⁵⁰

Harris continued to recommend to Palmer that a registered civil engineer have responsibility for the safety of the tailings, especially if they were to be removed.³⁵¹ Palmer considered that Harris' requirement that any removal of sand be done under the supervision of an engineer followed by periodic inspection by same 'even after title surrendered' was 'reasonable', given that Harris lacked

the staff or resources to do the technical work required, and solves the problem of current and future control. After the title has been surrendered, the Ministry of Works may be able to supply him with the periodical reports he requires but when the thing is finally static his own organisation should be able to do

³⁵⁰ A.G. Palmer to L.S. Jones, 10 October 1974, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁵¹ R.W. Harris to A.G. Palmer, 24 October 1974, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

any inspections required - this would seem to me to be part of their job.³⁵²

Palmer ordered Barbarich that all sand removal from the dam and downstream of it 'must cease immediately'. As the dam was 'the subject of much official and public notice', his action was 'being taken to reassure everyone that there is no inherent danger in these tailings'. Sand might be removed later from places approved by Palmer and an engineer.³⁵³ At the end of October, Barbarich informed Palmer that he was recommending that his firm surrender the site licenses for the tailings dam, 'as my personal opinion is that it is going to be to much of a headache, and I would not recommend my Board spending any money on Engineers reports. I see no finish to the problems that may arise'.³⁵⁴ Palmer arranged for an engineer to check the dam whilst it remained under Mineral Resources' ownership, and considered the responsibility should go to the catchment board thereafter. 'If they cannot police it', perhaps the Ministry of Works might inspect.³⁵⁵ Not till 20 November did Jones inform Gibson of these actions. He doubted whether the tailings, if left alone, would 'cause any threat to life or property and no further action will be taken by this Department other than routine inspections while any work is being carried on, on the property as a whole, unless there is a proposal to remove the sand for sale'.³⁵⁶

The threat of the tailings to the environment was worrying others. In September, a visiting expert on toxic mine waste told the *Waikato Times* of tracing the cause of a 12 foot wide strip of dead bush to the tailings, the 'most toxic' he had experimented with, for grass could hardly grow on it.³⁵⁷ The Inspector of Mines' office checked with the scientists who had tested the

³⁵² A.G. Palmer to L.S. Jones, n.d. [c. 24 October 1974], Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

³⁵³ A.G. Palmer to J.P. Barbarich, 17 October 1974, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁵⁴ J.P. Barbarich to A.G. Palmer, 29 October 1974, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁵⁵ A.G. Palmer to Secretary of Mines, 30 October 1974, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁵⁶ L.S. Jones to A.W. Gibson, 20 November 1974, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁵⁷ Dr T. McNeilly, reported in *Waikato Times*, 26 September 1974; press cutting in HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

tailings and found that they considered them to be unstable, needed to be 'grassed etc' and were 'concerned about the Toxicity of the draining creek'.³⁵⁸ Palmer was not impressed with this 'ill-informed' article, for there was growth in the stream below the dam, and the general mineralised nature of the stream, which had nothing to do with mining, would affect plant growth. 'Generally the writer of the article had obviously no mining background and certainly little professional etiquette - there are means other than rushing into print of attracting attention to any problem', he told Jones.³⁵⁹

WHAT TO DO WITH THE CONCENTRATES?

Officials did not want the lead and copper concentrates still held at the mill site exposed to the elements, but would not meet the cost of protecting them. Klemick noted that the Receiver claimed that a written agreement with Mineral Resources placed responsibility for dry storage on the latter: Barbarich felt he had been duped and wanted 'to demolish the present storage area to extract the processing machinery'. Klemick believed that 'a realistic approach to the conflict would be to cover the pile with tarpaulins in situ' as it was 'housed on a concrete basement', but 'of course' each side wanted the other to meet the cost.³⁶⁰ Palmer warned Barbarich that his company must 'avoid any tendency to pollute the water in adjoining streams' by the concentrates and the mill that it was demolishing.³⁶¹ He informed the Secretary of Mines that the concentrates were deteriorating and causing a 'risk of pollution'.³⁶² In October the Receiver was told that if he could not sell them, they must either be buried or some other 'satisfactory means of disposal' carried out that would minimize any

³⁵⁸ Memorandum on article in *Waikato Times* on 28 September 1974, 7 October 1974, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

³⁵⁹ A.G. Palmer to L.S. Jones, 17 October 1974, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

³⁶⁰ Gerard Klemick to L.S. Jones, 5 February 1975, Ministry of Commerce, AATJ 6090, 23/2/1257, ANZ-W.

³⁶¹ A.G. Palmer to J.P. Barbarich, 24 February 1975, Ministry of Commerce, AATJ 6090, 23/2/1257, ANZ-W.

³⁶² A.G. Palmer to Secretary of Mines, 14 August 1975, Ministry of Commerce, AATJ 6090, 23/2/1257, ANZ-W.

potential environmental hazard.³⁶³ Somerville then arranged with Barbarich that, when the concentrates were buried to the satisfaction of the authorities, it would be 'released from its obligation to store' them.³⁶⁴ Barbarich was willing to bury it at no cost, 'but he would not be prepared to pay anything for it', as it could not be sold profitably.³⁶⁵ The department required that it be buried to the satisfaction of board, council, and Palmer, Jones recommending to the latter that it be totally enclosed in polythene 'to minimise leaching and metal contamination of nearby streams'. Should the company object, the department would pay for the polythene.³⁶⁶ That this was done was indicated by a subsequent letter Palmer wrote to Barbarich in which he stated that 'there would be no objection' were it to remove the concentrates 'for disposal elsewhere', because there was 'a certain risk of water pollution even though they were buried in plastic'. Their 'complete removal from the mountain might be advantageous'.³⁶⁷

1975

In late January 1975, Griffiths raised with Palmer issues noted a month previously by a member of the board's staff 'when in the area during a fire spotting inspection':

1. There were signs of rilling and erosion, both on the inside and outside batter of the bank around the heap;
 2. There were signs that material apparently is being or has been taken from the downstream end of the heap;
 3. The gabion dam, being some 20ft high, is of some concern.
- The netting appears to be corroding generally through. The tie wires are of very light wire which has corroded thus weakening the structure to such a state that in a relatively short time the

³⁶³ C.L. Wrightson (for Secretary of Mines) to Ian Sommerville, 29 October 1975, Ministry of Commerce, AATJ 6090, 23/2/1257, ANZ-W.

³⁶⁴ Ian Sommerville to J.P. Barbarich, 13 November 1975, Ministry of Commerce, AATJ 6090, 23/2/1257, ANZ-W.

³⁶⁵ Ian Sommerville to Secretary of Mines, 13 November 1975, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁶⁶ R.S. Barker to Ian Sommerville, 24 November 1975; R.S. Barker to A.G. Palmer, 24 November 1975, Ministry of Commerce, AATJ 6090, 23/2/1257, ANZ-W.

³⁶⁷ A.G. Palmer to J.P. Barbarich, 9 December 1975, Ministry of Commerce, AATJ 6090, 23/2/1257, ANZ-W.

gabion dam will be reduced to no more than a heap of stones 20ft high.

The board was concerned about 'the ultimate fate of the heap', for if the site license was surrendered, who retained responsibility? And who was to fix the corroded gabion tie wires?³⁶⁸ Palmer agreed that there was rilling and erosion, but this had not changed materially

for a considerable time. In fact, it is of interest that the water in the dam has almost dried up and withdrawn from the area around the natural spring; all this in spite of heavy rains in recent months.

No material has been taken from the downstream face of the dam – some small boys have disturbed the surface by using it as a slide.

I would not agree entirely that the gabion dam will be reduced to a heap of rubble in a comparatively short time. Admitted, the tie wires are rusting, but there is as yet no sign of movement.

I will take up the question of replacing the tie wires with the present owners.³⁶⁹

Palmer then required Barbarich to fix the tie wires, noting that they had been made 'of ordinary wire instead of the special wire' used for the gabions. He warned that the rust attracted comment, and 'proper wire would make the structure as reasonably permanent as might be required'.³⁷⁰ At the same time he told Jones that Barbarich 'might not appreciate the point that such preventative action is in his best interest'. Palmer could not see why the gabion dam had been erected, and considered it along with 'the temporary sand dam above it' should be removed.³⁷¹ By this time there was 'less water than ever in the dam'.³⁷²

³⁶⁸ R.W. Harris, per A.D. Griffiths, to A.G. Palmer, 23 January 1975, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁶⁹ A.G. Palmer to R.W. Harris, 29 January 1975, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁷⁰ A.G. Palmer to J.P. Barbarich, 21 February 1975, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁷¹ A.G. Palmer to L.S. Jones, 21 February 1975, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁷² A.G. Palmer, Report for January 1975, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

Removal of the tailings was the favoured option of the borough council, which in early 1975 was negotiating with Mineral Resources to do this.³⁷³ It continued to ask who was responsible for the dam and its safety.³⁷⁴ Palmer argued that as the council owned the land, had received rent, and the conditions of the license had been met, 'they could be deemed to be responsible for the dam', although he had 'no doubt that considerable legal argument could arise'. The tailings should be grassed by Norpac 'if the receiver has any available funds and, if not by the Mines Department. The Borough may feel that they, as the landowners, should contribute'. The council should then annually inspect and clean the drains; the catchment board should advise on the state of the dam 'from time to time'.³⁷⁵ For its part, in May the council strongly recommended to the board that the heap be 'removed under supervision', offering 'its co-operation and assistance'.³⁷⁶ In July it still wanted the responsibility for the tailings resolved, fearing that with the sale of the license to Mineral Resources the agreement with Norpac was no longer applicable.³⁷⁷

The last attempt in 1975 to pass the financial buck was the board's suggestion to Palmer in September that the tailings be inspected annually by a registered civil engineer, which it would be happy to arrange if, it was implied, the Mines Department would pay.³⁷⁸ Later that month, Feasey told the council that a test of Tui water showed it be 'of a very high colour and with a lead and cadmium content requiring further attention'.³⁷⁹ Late in that year, three researchers from the Department of Chemistry, Biochemistry, and Biophysics at Massey University checked the levels of

³⁷³ Roger Dewhurst to R.W. Harris, Memorandum entitled 'History of Tui Mine and Tailings Dam', 26 October 1978, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

³⁷⁴ R.W. Harris to A.G. Palmer, n.d. [end of April 1975], Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁷⁵ A.G. Palmer to Secretary of Mines, 2 May 1975, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

³⁷⁶ Town Clerk to Secretary, Hauraki Catchment Board, 23 May 1975, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

³⁷⁷ R.W. Harris to A.G. Palmer, 8 July 1975, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁷⁸ A.D. Griffiths to A.G. Palmer, 10 September 1975, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

³⁷⁹ *Te Aroha News*, 23 September 1975, press cutting in Health Department, YCBE 1990/232c, ANZ-A.

copper, cadmium, lead, and zinc in the soil, streams, and vegetation around the mine.³⁸⁰ They concluded that it was 'clear that there is a widespread distribution of air-borne cadmium, copper, lead, and zinc from dust particles emanating from the ore treatment plant at the Tui Mine. Stream sediments and waters are also heavily polluted in the immediate area of the mine and treatment plant'. They refrained from assessing 'the overall environmental impact' because their initial investigations had not been extended to the township.³⁸¹ If any further investigations were made, they were not published.

The legal situation concerning the site was 'complicated', as a Mines Department official advised Palmer in September 1975:

If Norpac were not in receivership, and likely to go into liquidation shortly, and the company's assets being sold, it could be said that the responsibility for carrying out the work should be that company's. However, it is in receivership and the assets are being sold! While an agreement exists between the receiver and Mineral Resources for the sale of the mining privileges, this agreement has not been registered against the particular site licence concerned – nor is it ever likely to be.

It is doubtful that the site licence should ever have been granted, since it was over alienated land, and it now can't be exchanged for a new privilege under the 1971 Mining Act. Until an agreement is registered, in terms of the Act it does not have any force or effect. Thus it can hardly be said that Mineral Resources have any responsibility at this stage!

The Council own the land but as it did not construct or use the dam I doubt that it would feel it had any real responsibility because of its agreement with Norpac. It may have a legal responsibility as owner if there were any hazard, but if Mineral Resources wish to continue operations using the tailings dam this work might be the price of its approval to do so!

Clearly the surfacing, grassing and regular maintenance should be carried out as soon as possible and unless you can see some arrangement between the Council and Mineral Resources being agreed we may even have to contemplate having the surfacing and grassing done ourselves.

³⁸⁰ N.E. Ward, R.R. Brooks, and P.D. Reeves, 'Copper, Cadmium, Lead and Zinc in Soils, Stream Sediments, Waters, and Natural Vegetation around the Tui Mine, Te Aroha, New Zealand', *New Zealand Journal of Science*, vol. 19 no. 1 (1976), pp. 81-89.

³⁸¹ Ward, Rogers, and Reeves, p. 89.

Palmer was asked to indicate the likely cost of doing this, and whether Mineral Resources needed the tailings dam for its operations. The department 'had suggested the special sites be surrendered and the company enter into a lease for use of the land with the Council, but have not heard further from them on this suggestion'.³⁸² After receiving a reminder, Palmer responded in late January, explaining that the delay was because 'the situation was uncertain'. As Mineral Resources seemed 'to have clarified their plans', and did not wish either to use or to sell the tailings, they 'should be grassed and I suppose we must assume this responsibility. Norpac have not the resources to pay for it, Mineral Resources cannot be expected to assume responsibility, and no doubt the Council will not make any funds available'. The council should be asked if they would agree to the grassing, for he 'did hear talk of their wanting to sell the tailings'. Once grassed, it should be the responsibility of the catchment board to inspect the tailings occasionally. 'They have offered to engage a suitable registered engineer to do this work, presumably at our expense', but this was not necessary.³⁸³ In June, Lynam told the Senior Soil Conservator, Paul Hansen, that the dam had recently been almost completely full and, 'if overtopped, would almost certainly fail'. His staff 'would be willing to remove the dam in the interests of safety'. Palmer was contacted; he doubted there was any danger, but agreed to inspect.³⁸⁴ Two months later, the Paeroa Racing Club applied for some of the tailings for its new sand track. Because of the question of their stability, the board was approached to see if removing sand was possible.³⁸⁵

Heavy rain in August causing deep scouring of a clay dam prompted the council at the beginning of September to ask Palmer to inspect and to once more ask who was responsible for repairs.³⁸⁶ Palmer responded that this was only a temporary dam needed to control the water whilst work was

³⁸² M.A. Canning to A.G. Palmer, 16 September 1975, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁸³ A.G. Palmer to Secretary of Mines, 23 January 1976, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

³⁸⁴ Memorandum by Paul Hansen (Senior Soil Conservator), 29 June 1976, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

³⁸⁵ *Te Aroha News*, 31 August 1976, p. 1.

³⁸⁶ J.R. White to A.G. Palmer, 1 September 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

done, and did not create danger.³⁸⁷ A week later, after having inspected the site with board engineers, he telephoned Jones to report that urgent work was required because the

rain storm was so severe that the contour ditch protecting the tailings dam overflowed resulting in material being carried from the main dam to the lower secondary dam which was filled with tailings. Remedial work was immediately necessary to prevent sand being washed into the small stream of which these dams form the head.³⁸⁸

In a subsequent letter he stated that ‘urgent repairs to the clay dam downstream of the tailings dam’ were necessary ‘to avoid damage both to the area downstream and to the stability of the tailings area’. It would cost less than \$1,000 to repair and raise the clay dam plus clean out and sand bag some of the contour drain pending ‘more permanent measures’; the department should meet the cost.³⁸⁹

In early October the Broadcasting Council of New Zealand sought Palmer’s assistance in alleviating the flood damage to the mountain road, because as their transmitter was permanently manned, ‘an assured access at all times is vital’. In the August floods, ‘only the foresight of the road supervisor who had men and machinery standing by to clear the culverts of flotsam and blockages as they occurred, prevented more substantial damage’ to the road where it crossed the Tunakohia Stream.

A subsequent inspection further up the stream showed that at the No. 5 working level of the Tui mine, material was eroding from the toe of the fill and of greater concern was the dumped material from mining operations – timbers, discarded equipment etc – which was finding its way into the stream and its potential for blockage of the culverts.

The council’s consulting engineers had ‘expressed concern at the threat the tailings, mullock heap and sediment ponds, now in a state of neglect’,

³⁸⁷ A.G. Palmer to J.R. White, 7 September 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁸⁸ Memorandum by L.S. Jones, 22 September 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁸⁹ A.G. Palmer to L.S. Jones, 27 September 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

posed to the road 'near the junction of the mine and Broadcasting roads'. Requests to Mineral Resources 'to clear up their discarded material and site, has as yet been of little avail', and the matter was now urgent because it would be relinquishing its interest in the mine in December. The council sought assistance and a discussion with its staff on site.³⁹⁰ Palmer responded briefly: the matter was 'being dealt with in spite of press statements to the contrary', and there was no need to talk about the issue until more progress was possible.³⁹¹

This erosion coupled with the proposal to remove sand prompted Lynam to restate his earlier fears about the danger above the township. In a front-page article in the *New Zealand Herald* in mid-October he was quoted as saying 'we do not know whether we will have another Aberfan or not'. White feared that the tailings might slide onto the golf course or a row of houses, and the deputy chief engineer of the catchment board did not know if the tailings were safe. He also noted that the minerals leaching from the tailings were killing the bush, even large trees over 100 years old. Asked for his response, Palmer said there was 'absolutely no threat of a disaster'. Lack of maintenance had caused a minor dam breach during recent heavy rain, but this had been stopped as soon as his department discovered the problem. As for pollution, 'there were massive mineral deposits in the mountain and natural springs brought them to the surface'.³⁹² On the same day, the *Waikato Times* had a front-page photograph of Desmond Robert Ladyman,³⁹³ the Broadcasting Council's supervising technician, standing 'in the scar left by mining operations' after the stream's headwaters were diverted by mining 'and it became a raging torrent carrying boulders and debris which scoured out road links to the television repeater station'. Above the photograph was the caption: 'The miners' memorial'.³⁹⁴ A full-page article on an inner page was entitled 'The Mess the Miners Left Behind' and illustrated with a dramatic photo taken from the base of the dam showing heavy scouring caused by winter rain and another of trees killed by the chemicals seeping from the tailings. Audrey

³⁹⁰ R.G. Belcher, for Property Manager, to A.G. Palmer, 5 October 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁹¹ A.G. Palmer to R.G. Belcher, 19 October 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁹² *New Zealand Herald*, 16 October 1976, p. 1.

³⁹³ *Piako Electoral Roll, 1975*, p. 50.

³⁹⁴ *Waikato Times*, 16 October 1976, p. 1.

Eagle, of the Waikato branch of the Royal Forest and Bird Protection Society, was quoted as calling for 'a requirement on every mining license that the area be returned to its natural state after they've finished'. Ladyman complained of mine debris still washing into the stream and affecting the road, and reported tourists commenting on the mess. Cyril Eastwood, the mayor since 1974, wanted the tailings removed, arguing that, as the Mines Department 'gave the license in the first place', it was their responsibility. He hoped people would buy truckloads of the tailings to use as fill, the sales meeting the cost of excavation; 'the operation would have to be completed during summer months under expert direction'. He worried that official inaction would allow the tailings to remain: the dam 'could sit there for 20 years until someone forget about the drainage and then down it would come'. Harris considered the tailings certainly could not be left, because drainage could affect their stability. He did not 'want to cause a scare', but heavy rain would cause more erosion. Work to be done during the year would make the heap more stable, but he complained that it was not work that the catchment board should have to do. 'It had made strong - but unsuccessful - submissions asking for tough conditions to be attached to the Tui mine license, which would have avoided the present problem'.³⁹⁵ Palmer had the chance to comment before the *Herald* article was published, but the *Waikato Times* had not extended the same courtesy over its 'ill-informed to say the least' article.³⁹⁶ He wrote to the council quoting Eastwood's desire to have the tailings removed, for it was clear that the councillors wanted this done 'and have some concrete ideas on how this can be done. This is the obvious solution to the problem', and he asked them for 'any suggestions'.³⁹⁷ Their response was that they had received requests to use the sands but wanted to discuss with the catchment board the difficulties of removal.³⁹⁸

By the time these articles were published board staff had repaired the clay dam on Palmer's behalf. Harris told Palmer that the 'short term work' of strengthening the gabion dam and 'dealing with the stormwater/spring discharge' would cost about \$3,000 and should be done without delay. Their

³⁹⁵ *Waikato Times*, 16 October 1976, p. 19.

³⁹⁶ A.G. Palmer to R.W. Harris, 18 October 1976, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

³⁹⁷ A.G. Palmer to Mayor and Councillors, Te Aroha, 18 October 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

³⁹⁸ J.R. White to A.G. Palmer, 27 October 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

investigation of 'the general state of the heap' was 'ample demonstration of the results of lack of maintenance', and he was 'beginning to be alarmed at it. These repairs would 'still leave unresolved how to ensure that water reaching the tailings heap is shed safely and also, how to ensure the safety of the toe of the heap, both in the long term and in a fashion that relies on maintenance as little as possible, if at all'. He was ready to carry out the short term works on Palmer's behalf, but unless these were 'undertaken very soon I regret that I will be placed in the rather invidious position of having to report to Board that the situation has become potentially dangerous'. These measures would not eliminate the danger, and 'longer term measures and policy are almost as important and urgent'. While 'appreciative of your assistance', the board's position was 'becoming increasingly awkward' as the project was not its responsibility.³⁹⁹ Palmer told Jones the amount needed for repairs, adding 'I'll press to get the sands removed, but a large scale operation would be necessary because piecemeal removal could only lead to unstable conditions'.⁴⁰⁰

On the same day that Palmer asked Harris for his views on removing the tailings and whether there were any interested buyers.⁴⁰¹ Also on that day Donald Taylor of Tonkin and Taylor reported to Harris on his visit to the site earlier that month, the first time this firm had seen it since 1974. Inspection had shown that 'the contour dam around the west side' of the pond had overflowed: it had since been 'cleared out and the side raised with sand bags in some places'. A 'visible high water mark' confirmed that 'outlet pipes from the spring, and the decant pipes had been unable to keep pace with surface water inflow and water had ponded to a depth of about 6 feet at the back (north end) of the tailings deposit'. There were two deeply scoured gullies in the dam which 'significantly reduced' its stability, and 'continuing erosion will result from current seepage from within the tailings and from surface water concentrating in these gullies'. The capacity of the stormwater pipes and channels to discharge peak rainfall should be investigated, and the dam should be reshaped and protected 'to maintain long term stability and to reduce its susceptibility to erosion'. The firm

³⁹⁹ R.W. Harris to A.G. Palmer, 15 October 1976, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

⁴⁰⁰ A.G. Palmer to L.S. Jones, 18 October 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

⁴⁰¹ A.G. Palmer to R.W. Harris, 18 October 1976, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

offered to investigate 'on a time and expenses basis'.⁴⁰² Harris sent a copy of this letter to Palmer and offered to be his agent in carrying out these investigations, estimated to cost \$2,000, as being the most convenient way of getting action 'carried out expeditiously'.⁴⁰³

On 28 October, Palmer met Harris 'at his urgent request', and they discussed the state of the dam. Both men agreed that 'urgent temporary repairs should be made'. Palmer considered this necessary 'both from the safety angle and also to establish good public relations in view of the adverse recent criticism in local and national papers'. Drains and ditches 'should be put in hand immediately in case of storms which may be expected at this time of the year and have an intensity of around 4 inches of rain an hour'. The board's offer to fill the gullies on the dam face should be accepted, and Tonkin and Taylor should be asked to report.

I have stressed that any work projected should be designed towards the establishment of a permanent asset which should not rely on maintenance of pipes and drains, and on constant surveillance, for its stability.

It is apparent that the tailings constitute a danger if they become super-saturated as they have during this last wet season. The construction of the dam has perhaps not helped because an impermeable core has prevented drainage and allowed the formation of a fluid mass behind it and this material could create havoc if it broke loose. On the side of the dam near the road I have the impression that this mass is near to breaking out – the recent heavy seepage has stopped but the bank is still soggy.

Ideally the sands should be removed but their fineness and iron content makes them unattractive. The unauthorised removal of the coarser sands from the dam wall was attractive obviously, but the fines must be removed from the upstream end first if any such project is possible.

He added that this letter had not been copied to the board',⁴⁰⁴ clearly because he confirmed Harris' fears about the inherent danger posed by the tailings. Instead, Palmer contacted the board to confirm the cost of 'the so-called short term works', which he estimated would cost \$6,000. In addition,

⁴⁰² D.K. Taylor (of Tonkin and Taylor) to R.W. Harris, 18 October 1976, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

⁴⁰³ R.W. Harris to A.G. Palmer, 28 October 1976, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

⁴⁰⁴ A.G. Palmer to L.S. Jones and Phil Taylor, 29 October 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

he agreed to meet the \$2,000 cost of Tonkin and Taylor's investigations, but wanted an assurance that their report would 'recommend means of attaining permanent maintenance-free stability'.⁴⁰⁵ At the same time he told Jones that he 'had doubts about the necessity of an engineer's report but now consider it vital to have this problem settled without doubt for all time. The expense is necessary in the interests of public safety – and of public relations'.⁴⁰⁶

The National Conservation Council had sent an officer to inspect the heap, who recommended its immediate removal, as did Forest and Bird.⁴⁰⁷ In another interview with the *Te Aroha News*, Lynam explained that the worst pollution was of the Tunakohoia Stream:

"The runoff is pretty potent," he said.

Speaking as a private individual, Mr Lynam said he saw the only solution to be the complete removal of the tailings.

From a Broadcasting Council point of view there is the added concern of rubbish and fill being carried down into culverts causing blockages.

"These have to be cleared with machines at considerable cost. Norpac Mining Limited is now out of existence, and we feel the taxpayer will have to meet the expense. This is a major concern of ours," he said....

Mr Lynam said while the environmental aspects were of prime concern to him, along with the cost of removal, there was the added problem of stability as long as the tailings remained in their present position.

"If there was to be a breakout sideways from the stockpile it would affect the road up to the top of the mountain," he said. This is causing concern to the Broadcasting Council."⁴⁰⁸

Alf Williams, who had been a maintenance worker at the mine for the last three and a half years of Norpac's existence, warned against touching the pond, which could be 60 feet deep:

"When you remove the hard outer crust of dried out sand you come to slime and sludge.

⁴⁰⁵ A.G. Palmer to G.H. Caddie, 5 November 1976, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

⁴⁰⁶ A.G. Palmer to L.S. Jones, 5 November 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

⁴⁰⁷ *Te Aroha News*, 14 October 1976, p. 1.

⁴⁰⁸ *Te Aroha News*, 14 October 1976, p. 1.

Using heavy machinery, once they get down a certain number of feet they'll find what's beneath the surface moving like a swamp," he said.

"Pockets of slime could erupt suddenly with a loss of machinery, or possibly life."

He stated that Norpac had done everything possible to ensure the safety of the dam; as for pollution, all the creeks were polluted in times of heavy rain, 'but they soon cleared'. The tailings should be left alone, and his advice to Lynam was 'the same as that given him by the Norpac Mine's Manager a few years ago: If you want something to talk about talk about something you know about, and give us better television reception in this area'.⁴⁰⁹ Williams' views created the story that after a storm, when a bulldozer drove onto the pond to repair a collapse of the dam, it sank, and although the driver's workmates succeeded in saving him, the bulldozer sank to the bottom and was never recovered; unfortunately for this urban myth, when the pit was finally totally excavated and stabilized no machinery of any kind was discovered.⁴¹⁰

During November the catchment board filled the gullies to the satisfaction of a Tonkin and Taylor engineer, and arranged for surveillance and maintenance till the following March. To deal with 'the spring-water discharge pipe' Harris proposed 'to collect the water in a chamber and take it by way of a new pipe either above the gabion dam or to discharge via a perforated pipe onto the dam itself'. The existing gabion dam would be 'completely covered by a new rock-filled basked 0.8 metres in thickness to retain the existing structure which has been subject to severe corrosion of the wire', using copper wire and possibly 'some of the rock around the mine complex'. He confirmed that Tonkin and Taylor had been asked to recommend ways to leave the heap 'in a stable but maintenance-free state'.⁴¹¹ To meet all these costs, the Mines Department agreed to spend up to \$8,000.⁴¹²

⁴⁰⁹ *Te Aroha News*, 19 October 1976, p. 1.

⁴¹⁰ Conversations with Waikato Regional Council staff directing the final remedial works: Dennis Crequer, 23 March 2009, and G Bashir, 18 November 2014.

⁴¹¹ R.W. Harris (per G.H. Caddie) to A.G. Palmer, 15 November 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

⁴¹² Secretary of Mines to R.W. Harris, 13 December 1976, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

While officials continued to argue over responsibility and financial liability, Harris told the press that the Mines Department did not want to get involved, but there was ‘no alternative’.⁴¹³ The council for its part was irritated at a three-month delay in getting advice from the board, without which it could not reply to the Paeroa Racing Club’s requests, and sought conditions for completely removing the heap. It was keen to have the area restored to its natural environment, thus avoiding the increasing costs of maintaining the tailings in a safe condition.⁴¹⁴ But at a meeting with board representatives at the site on 26 November, Eastwood was told that no decision to remove the tailings could be made until Tonkin and Taylor’s report was received. When the Works Committee was informed of this, ‘the view was expressed that if the Board will not permit removal of the tailings then it must accept full and absolute responsibility for the tailings area’.⁴¹⁵ And once more the golf club complained that water pollution was ruining its greens, and wanted the council to stop this.⁴¹⁶ At the end of the year, the council received advice about how to grass and vegetate the tailings and dam.⁴¹⁷

Williams again warned the council and the board, who were finally to meet in December, against tampering with the tailings:

“There are four inch drainage pipes which go down through the heap, and these are set in concrete lower down. If any damage is done to these at the lower end then pollution will result,” Mr Williams said.

He said it would be almost, if not impossible to stop the pollution because of the tremendous depth of the slime and sludge that forms the tailings heap estimated to be at least 60 feet.

“The vulnerable end of the dam in this respect is the end nearest the mill site. Because it holds water, for safety reasons the depth of the sand will be considerably less which means you can’t get at any depth without trouble,” he said....

⁴¹³ *Te Aroha News*, 16 November 1976, p. 1.

⁴¹⁴ *Te Aroha News*, 23 November 1976, p. 1.

⁴¹⁵ Report of a Meeting of the Works Committee of 7 December 1976, *Te Aroha Borough Council Minute Book 1976-1977*, p. 826, Matamata-Piako District Council Archives, Te Aroha.

⁴¹⁶ *Te Aroha News*, 25 November 1976, p. 1.

⁴¹⁷ David Ives (ANZDEC Ltd, Agricultural and Forestry Consultants), ‘Report on Examination of Samples from Mine Tailings at Mt Te Aroha’. 19 December 1976, *Te Aroha Borough Council*, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

“I do not think the Hauraki Catchment Board or the Mines Department would be so silly as to agree to the removal of the tailings, even after thorough investigation.”⁴¹⁸

The board did indeed decide that nobody would be permitted to remove any tailings until engineers had advised that this would be safe. Williams might ‘well be right about the nature of the tailings heap’, commented Harris, who admitted that the board had taken no pollution readings of the Tui and Tunakohoia Streams, although he thought the Health Department might have.⁴¹⁹

1977

Early in the year, Harris thanked Palmer for the grant of \$8,000, and hoped that there would be no need ‘for frequent maintenance measures’. The clay dam had been repaired, and work done ‘to by-pass the spring water so it flows through the gabion dam’, upon which an extra layer of rock had been placed.⁴²⁰ As the Mines Department did not expect the dam to collapse, it discouraged talk of totally removing the tailings, an unwarranted ‘hardy annual’ in Jones’ view.⁴²¹ They represented ‘a minimal risk to the town’, although ‘any flow of sand could represent a nuisance by causing some pollution’.⁴²² Eastwood hoped that Tonkin and Taylor’s report would give information about how the sands could be removed safely, for he had a buyer for fill.⁴²³ Palmer considered that the removal of sand ‘lies outside my jurisdiction and is really a matter for the Council to take up with the water authority’.⁴²⁴

⁴¹⁸ *Te Aroha News*, 30 November 1976, p. 1.

⁴¹⁹ *Te Aroha News*, 14 December 1976, p. 1.

⁴²⁰ R.W. Harris to A.G. Palmer, 10 February 1977, Ministry of Commerce, AATJ 6090, 13/25B, ANZ-W.

⁴²¹ L.S. Jones to A.G. Palmer, 13 May 1977, Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴²² L.S. Jones to A.G. Palmer, 18 July 1977, Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴²³ A.G. Palmer to L.S. Jones, 14 July 1977, Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴²⁴ A.G. Palmer to Town Clerk, Te Aroha, 5 August 1977, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

In July, Jones informed Palmer that, as the special site license had expired, the council now owned the tailings site because it had ‘obviously not declined ownership in terms of S122 (5)’.⁴²⁵ Palmer informed it that as the tailings were ‘deemed to have been abandoned by the company’ they were now ‘vested in the Council as owners of the land’.⁴²⁶ When advising Harris to make a ditch around the side of the dam to avoid water in the pond activating the slimes and grumbling at the time Tonkin and Taylor were taking to report, Palmer repeated Jones’ argument that as the council ‘did not request removal of the tailings under section 122 (5) of the Mining Act’ and had acknowledged ownership by trying to sell them it could be ‘fairly construed’ that it accepted responsibility for them.⁴²⁷ This argument exaggerated the council’s knowledge of the Mining Act and tried to remove all responsibility from the Mines Department. When, on 20 September, the council resolved that it was ‘imperative that the tailings be removed as soon as possible’ and requested Palmer’s formal approval,⁴²⁸ this was immediately given, and Palmer encouraged Harris to see the financial benefits of supporting his view of what the agreement meant. ‘As the Borough clearly assumed responsibility for the sands’, he argued ‘that any maintenance charge raised by the Board after that date should be paid by the Borough’.⁴²⁹ However, the board’s position remained that agreed to in August: that the government must assume ‘full and continuing responsibility’ for meeting all current and future costs.⁴³⁰ Palmer privately encouraged his department not to pay these:

⁴²⁵ L.S. Jones to A.G. Palmer, 18 July 1977, Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴²⁶ A.G. Palmer to Town Clerk, 5 August 1977, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council, Te Aroha; A.G. Palmer to Town Clerk, 22 August 1977, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

⁴²⁷ A.G. Palmer to R.W. Harris, 30 August 1977, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

⁴²⁸ Acting Town Clerk to A.G. Palmer, 27 October 1977, Inspector of Mines, Box 16B, 13/25-B, vol. 2, MC.

⁴²⁹ A.G. Palmer to Acting Town Clerk, 30 September 1977, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha; A.G. Palmer to R.W. Harris, 1 December 1977, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

⁴³⁰ R.W. Harris, Memorandum entitled ‘Mining in Coromandel-Kaimai-Mamaku Ranges with Particular Reference to Mt Te Aroha and the Tailings Heap’, 8 June 1979, p. 8, HCB, Series 1, Box 206, 7/2, vol. 3, WRC.

I do not think we should continue payments, especially for temporary remedies. If the Te Aroha Borough say categorically that they do not wish to remove the tailings and they want them to be permanently stabilized, then I feel we could help with suitable works.

The delay is receipt of the Tonkin-Taylor report is clearly at the root of the present trouble. I doubt we should pay for this.⁴³¹

At its November meeting, the council's works committee received a letter from Palmer formally approving the council removing the tailings 'in a safe manner'.⁴³² In December, he publicly explained that the council was now 'fully responsible'. When the special site license expired it had had three months in which to ask the Mines Department to remove the tailings, which it would have been obliged to do. This possibility had lapsed by default, for the council had only asked for approval to remove them, expecting to find 'an outlet for the material'. Eastwood responded that the council did want the heap to go but could not afford the \$200,000 needed to remove it, and complained that the department had washed its hands of it.⁴³³

Approval to remove the sands did not mean there would be immediate action, for the catchment board had to be consulted on the conditions governing any removal. As before, the council declined to meet the cost.⁴³⁴ Tonkin and Taylor's supplementary report, received in August, noted that revegetation had not been attempted, as earlier recommended, and that more sand had been removed from the retaining wall; they warned that if this persisted the dam might collapse. It also warned of the 'consequences of unchecked erosion':

As pointed out in our 1974 report the tailings dump as a whole has an adequate margin of stability provided the outer "dam" of sandy material is preserved.

If deep scouring, such as occurred in 1976, persists then there is a grave risk of major collapse and escape downstream of the

⁴³¹ A.G. Palmer to L.S. Jones, 30 August 1977, Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴³² Order Paper for meeting of the Works Committee of the Te Aroha Borough Council to be held on 8 November 1977, item 9, Sam Guernier Papers, Te Aroha.

⁴³³ *New Zealand Herald*, 21 December 1977, press cutting in Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴³⁴ *Te Aroha News*, 22 November 1977, p. 1.

tailings. The two small dams downstream have only a limited capacity to retain sediment and once it passes them the steep drop into Tui Stream would result in great damage to the watercourse downstream.

The gullies which form, reduce the mass of the dam of sandy spoil retaining the softer “slimes” behind it, and also greatly shorten the path of seeping groundwater thus increasing its erosive potential even after the passage of surface runoff.

The storm of September 1976 proved that ‘continuous maintenance of the water disposal system is critical to the safety of the dam’. Maintenance work such as clearing fallen leaves at the onset of a storm was necessary ‘if the existing system is to be depended upon’, but quite apart from the question of who was responsible for such maintenance it was debatable whether this was realistic. Instead, ‘work should be done as soon as possible to make the tailings dump more secure against erosion and less dependent upon critically times maintenance’. It recommended ‘a better system of surface water runoff disposal, and surface protection of the tailings dam including denial of public access’.⁴³⁵

At its December meeting the board accepted Harris’ recommendation, based on this report, that the dam be protected at a cost of \$50,000 instead of the difficult alternative of removing the tailings for \$200,000:

Mr Harris told the Board a report had been compiled by Consulting Engineers, Messrs Tonkin and Taylor, and by A.N.Z.D.E.C. Limited. Both reports made the point that within the limits of the investigation the dam and tailings dump appeared to be quite stable (and safe) provided that the outer dam of sandy material was preserved.

As far as could be determined by the consultants the outer dam of sandy materials was gradually built up by the mining company to retain finer sands and silts comprising the softer (slimes) which constitute, it is believed, a large proportion of the total tailings heap....

The A.N.Z.D.E.C. Limited report ... states: “...the principal sources of toxicity are the extremely high lead, sulphur and arsenic contents in the spoil and the very low pH of the stream waters.”

⁴³⁵ Supplementary Report by Tonkin and Taylor, Consulting Engineers, Auckland, for Hauraki Catchment Board, August 1977, pp. 2-3, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

Mr Harris said this factor was likely to restrict demand and there could be problems in finding a safe place to dump the material so that it did not pollute yet another water course.

The Chief Engineer said that in a removal project there was no way in which the outer sandy materials could be removed first, and that work would have to commence in the difficult area of "slime." This would be costly. Such an engineering process would have to be strictly controlled, with no allowances for casualness.... He said the demand for the tailings material was likely to be minimal, and the returns from a sale would probably be insufficient to meet the costs of expenditure....

The materials which may be wanted would more likely be the outer sandy materials.

"These are, of course the very materials which may not be removed in the first instance without creating a grave danger of failure," he said....

A further major factor was the sheer size of the tailings heap. The volumes are estimated at a hundred thousand cubic metres with depth of about twelve metres (40 feet) near the outer dam, and about 7.5 metres (25 feet) in the middle of the heap.

The consultants recommended re-forming the outer dam and revegetating it to minimize future scour. Trail bikes and other vehicles should be prohibited and pedestrian access discouraged. Storm water diversion should be installed urgently. It was 'accepted by all parties involved that inaction' would, 'sooner or later, create a hazardous situation, perhaps quite suddenly under certain storm conditions'. The board decided to seek funds from the department to carry out stabilisation measures.⁴³⁶ The *New Zealand Herald* reported one member angrily stating, 'We warned the Mines Department against allowing the mining operation to start in the first place. We were ignored and now we have the responsibility of seeing it is cleared up'.⁴³⁷ The reporter then discussed the issue with Palmer, who 'acquainted him with the facts which are very different'.⁴³⁸ There were indeed some exaggerated versions of past events being recounted, as when Charlie Thom, now a member of the council and an advocate for the

⁴³⁶ *Te Aroha News*, 20 January 1978, p. 1; Harris' full report is in his memorandum 'Mine Tailings Dam and Tailings Dump, Mount Te Aroha', 25 November 1977, HCB, Series 1, Box 206, 7/2, vol. 2, WRC.

⁴³⁷ J.D. Tait-Jamieson, cited in *New Zealand Herald*, 20 December 1977, press cutting in Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴³⁸ Memorandum by A.G. Palmer, 20 December 1977, Inspector of Mines, Box 16A, 13/15-B, vol. 2, MC.

complete removal of the heap, stated that part of it slipped down the mountain in 1969. 'The slip ended up in a gully during a women's golf tournament where up to a dozen women could have been playing'.⁴³⁹ This implied threat to life was an inflated version of the deposit of a small amount of tailings on a green.⁴⁴⁰

The summary of Tonkin and Taylor's report made public did not give full details of the problem. An appendix to the report gave the result of testing of the water coming from the mine itself which revealed the water to be strongly acidic with free sulphuric acid and acid sulphates. It would be 'very corrosive towards concrete, iron, steel and galvanised iron' and 'toxic to humans and animals'.⁴⁴¹ The mine had caused Te Aroha to lose 40 percent of its water supply, including its 'most dependable summer low flow stream', and the golf club would be forced to move its intake to a point upstream of the tailings, where the supply was meagre.⁴⁴²

1978

In February 1978, the council's Works Committee discussed the catchment board's December recommendations and reached a consensus that 'total removal of the tailings was the only solution' acceptable. Failing this, it supported the board's maintenance proposals, and invited its members to meet with the council and the Mines Department on-site to discuss removal.⁴⁴³ When this meeting was held on 16 May, Jones stated he agreed with the report and recommended that the front face of the dam be revegetated to prevent further erosion and the drainage system upgraded

⁴³⁹ *Waikato Times*, 27 February 1978, press cutting in Inspector of Mines, Box 16B, 13/25-B, vol. 2, MC.

⁴⁴⁰ See C.A. Thom to T.P. Shand, 29 March 1969, 17 April 1969, HCB, Series 2, Box 33, Te Aroha General, VIC4-5, vol. 4, WRC.

⁴⁴¹ T.J. Sprott and Associates, Report of 6 December 1976 to Tonkin and Taylor, in Supplementary Report of Tonkin and Taylor to Hauraki Catchment Board, August 1977, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

⁴⁴² J.D. Finlay (Urban Services/Design Engineer, Te Aroha Borough Council) to Mato Brdanovic (Inspector of Mines), 13 February 1981, Inspector of Mines, Box 16A, 13/15-B, vol. 2, MC.

⁴⁴³ Report of Works Committee meeting of the Te Aroha Borough Council of 14 February 1978, p. 3, Sam Guernier Papers, Te Aroha.

by making a side spillway so that water could not pond. The dam was well-constructed on lines used throughout the world, and the slimes, if kept dry, compacted and were difficult to fluidise again. He, like Eastwood, did not think the tailings should be removed, and was willing to negotiate over financial assistance.⁴⁴⁴ With this assurance, the board started work on erosion control on the dam face plus a drainage system for the surface area behind it.⁴⁴⁵

Other pollution hazards concerned the local bodies. Late in 1977 an on-site meeting between Barbarich and representatives of the council had agreed that in return for Mineral Resources paying \$200 the council would clean up the site adjacent to the tailings and remove the scrap iron. They agreed that the stockpile of lead concentrate could remain on site until the end of February 1978.⁴⁴⁶ In July that year, Palmer confirmed with Barbarich that that the council was to clean up the special site areas and that the remaining concentrates were 'required by you'. The Jaycees would remove all the old iron. 'You will recall I have offered to go to Tui with your men and clean up the place. Please inform when this may be arranged and also arrange to move or bury the concentrates at an early date'.⁴⁴⁷ Instead of burying the concentrates as ordered 'on several occasions', Mineral Resources later sold them for \$71,642.⁴⁴⁸

Yet another meeting at the site was held between council, board, and departmental representatives in May. Eastwood informed his council later that Jones, who had been present, 'was in no doubt as to the structural safety of the Tailings Dam provided adequate steps were taken to direct natural drainage'. It had been suggested that the council and the board make a combined approach to the department 'regarding the provision of a

⁴⁴⁴ Memorandum by Paul Hansen (Senior Soil Conservator), 'Tui Mine Tailings Heap', 17 May 1978, HCB, Series 1, Box 206, 7/2, vol. 2, EW; *Waikato Times*, 22 May 1978, press cutting in Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴⁴⁵ *Te Aroha News*, 16 May 1978, p. 1, 18 May 1978, p. 4.

⁴⁴⁶ Report of meeting of the Works Committee of the Te Aroha Borough Council of 5 December 1977, Sam Guernier Papers, Te Aroha.

⁴⁴⁷ A.G. Palmer to J.P. Barbarich, 12 July 1978, Ministry of Commerce, AATJ 6090, 23/2/1257, ANZ-W.

⁴⁴⁸ Secretary, Mineral Resources, to Deputy Secretary of Energy (Mines), 13 May 1980; A.G. Palmer to Ian Sommerville, 10 July 1980; Ian Sommerville to A.G. Palmer, 4 August 1980; A.G. Palmer to Ian Sommerville, 9 September 1980, Ministry of Commerce, AATJ 6090, 23/3/1257, ANZ-W.

spillway to direct surface water around the edge of the Dam'. The board would estimate the cost, and once this work was completed they could consider 'removing the Tailings Slimes in slices providing they could be moved to a site which would not result in pollution of other waterways'. The suggestion of a joint approach to the department to meet the cost was agreed to.⁴⁴⁹

The difficulties and the cost created by the tailings made Harris dispirited, as illustrated by a July report:

"The Tui Mine Tailings are proving to be a uniquely difficult problem to solve satisfactorily and economically"....

The Chief Engineer, Mr R.W. Harris, told the Board that he was concerned to see a report of a similar case in Australia where it was necessary to go through complicated and expensive procedures to eliminate the danger of the tailings.

It would be necessary to cover the whole of the tailings area with clay in order to seal the toxic mineral traces.

This clay would then be covered with gravel, and later topsoil, before vegetation could exist.

"I am hopeful we will find some way around it. If the nearby water supply is not destroyed forever it will certainly be destroyed for a lifetime"....

He pointed out also that downstream of the tailings area, the rocks below the low flow mark were discoloured as was the stream itself.

"It isn't that we can't do anything, it's simply that it isn't cheap."⁴⁵⁰

He was not the only person who was becoming frustrated at the lack of a solution; Palmer reported angrily after another meeting with Eastwood and the board on 3 November:

The usual waffling went on until I became somewhat impatient. I asked if anything had been done about moving the tailings seeing that they still constituted a menace, vegetation would not grow, etc etc: answer - NO.

I suggested I was not prepared to ask for any more funds to be frittered away and that a little positive action was called for. The mayor and others thought this a good idea - then Harris said you

⁴⁴⁹ Minutes of meeting of Te Aroha Borough Council of 13 June 1978, Sam Guernier Papers, Te Aroha.

⁴⁵⁰ *Te Aroha News*, 18 July 1978, p. 1.

could not possibly put them anywhere because they were too noxious. What to do?⁴⁵¹

Worried about the constant hill and gully erosion of the dam by rainfall and surface run-off, the board tried to stabilize it. 'However, the high acidity of the tailings made the establishment of vegetation extremely difficult' and it was clear that there was no 'simple or inexpensive' method, its chairman, Mark Madill, told its November meeting.⁴⁵² Nor without side effects: Thom complained to the council of the 'shocking mess' that came down the Tui Stream during the remedial work.⁴⁵³

Palmer still thought 'the sands should be moved and some enthusiasm by the Borough might bring this about'.⁴⁵⁴ The council did want their complete removal, at the cost of what was now the Mines Division of the Ministry of Energy because this had been 'responsible for framing the inadequate conditions under which the mining license was granted'. If it was not safe to remove them, the Ministry should meet the cost of keeping the dam safe.⁴⁵⁵

1979

Local phobias about the safety of the dam were reported in April 1979. Under the heading 'Slag Avalanche Fears Recur', the *New Zealand Herald* reported that Harris was 'very nervous' because of recent heavy rain. The heap was 'heavily saturated and quick action had been necessary to ensure stability' after 40 millimetres of rain fell in 90 minutes. 'There would have been serious trouble three weeks ago if something had not been done'. Why he made his concerns public was implied by his statement that he had overspent his original maintenance budget of \$8,000 by \$1,000 with \$3,000

⁴⁵¹ A.G. Palmer, Monthly Report for November 1978, Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴⁵² *Te Aroha News*, 14 November 1978, p. 1.

⁴⁵³ *Te Aroha News*, 16 November 1978, p. 1.

⁴⁵⁴ A.G. Palmer to L.S. Jones, 6 March 1979, Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴⁵⁵ D.B. Cunneen (Town Clerk) to Deputy Secretary of Energy (Mines), 6 July 1979, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

outstanding.⁴⁵⁶ Harris insisted that the work was ‘essential’ and ‘had to be done whether financial authority was available or not’. It was ‘so urgent that it had been impossible to finish funding negotiations before work had to start’. He estimated the cost of removal was \$200,000.⁴⁵⁷ Shortly afterwards, a Sunday newspaper quoted some residents as fearing a repeat of the recent Aberfan disaster. This article claimed that the dam had started to move after rain, and only quick action by the catchment board ‘stopped a deadly sea of toxic sludge from spewing down the Mt. Te Aroha mountainside’. One woman had discovered her home had been built ‘in the path of the looming Tui avalanche’, her stock would not drink from the Tui Stream, and plants watered from it died. The superintendent of the golf club’s greens said club members were ‘terrified’ something would happen. The only partially positive note was Thom’s statement that tests of the water showed the tailings caused little or no damage to the river.⁴⁵⁸ In the following issue, Jones pointed out that the recent freak storm had created only minor damage to the dam. ‘The tailings had been laid down in the best engineering principles’ and he doubted that \$20,000 was needed to stabilize them, as claimed by the board. He stressed that the dam was not dangerous and there was no similarity to Aberfan. ‘Even if the tailings were not kept drained they would not come down the hillside with a surge’. It would gradually erode away, which was why people must cease taking sand from the front of the dam, which had to be ‘protected and adequate overflow provided’.⁴⁵⁹

In early 1979 Feasey’s tests of water from the Tui and the north branch of the Tunakohia Streams proved that whilst the latter was acceptable the Tui had unacceptable levels of cadmium, zinc, iron, and manganese compared with World Health Organization standards. Although not a ‘potable water source’, the Inspector of Health considered that small quantities could be used in an emergency because other streams would

⁴⁵⁶ *New Zealand Herald*, 12 April 1979, press cutting in Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴⁵⁷ *Waikato Times*, 17 April 1979, p. 5.

⁴⁵⁸ *Sunday News*, 22 April 1979, press cutting in Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴⁵⁹ *Sunday News*, 29 April 1979, press cutting in Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

dilute it.⁴⁶⁰ ‘Gully erosion and stream pollution’ was so serious that in March and April ‘immediate use was made of the gravel on site’. Subsequent storms indicated, in the views of an official of the Health Department, that the board had ‘achieved almost total control of erosion and greatly reduced the flow of dump materials into the streams’. However, he warned that ‘if the heap were sufficiently neglected a “slush out” could take place effecting the Tui road area and the Waihou River waters’. For the sake of the river he considered it to be ‘essential that the Government take ultimate responsibility for any future mining privilege issued for the Kaimai-Coromandel ranges’.⁴⁶¹

Although Williams claimed he had had some success with growing trial plots of grass on the tailings, the catchment board doubted this would succeed. Harris stated that they were ‘completely infertile, but a lot of lime might do it’.⁴⁶² In June the board informed the Minister of Energy that the dump was ‘an immediate danger’ to water quality and requesting urgent funding to stabilize it and minimize pollution. The board wanted to ensure that water and soil conservation qualities be protected in future mining operations, both during and after prospecting and mining, and repeated ‘its strongly held belief that such effective protection’ could only be achieved if the government ‘as the licensing authority’ assumed ‘full and continuing responsibility’. Harris considered that the water supply streams had been seriously damaged, ‘probably irreparably’:

“A vivid indication of the acidity of the 100,000 cubic metre tailings heap ... and the corrosive nature of run-off or leachate on the heap is provided by drainage from the tailings pond into the north branch of the Tunakohia Stream via pipe and metal flume under Mountain Road,” he said.

“The metal flume comprising a new 16 gauge galvanised Marco fluming was virtually destroyed by corrosion in a little more than two months. Corrosion on this scale is thought to be due to significant concentrations of sulphurous and sulphuric acids.”

Mr Harris said the samples taken from the Tui and Tunakohia streams clearly shows the presence of toxic heavy metals including lead, cadmium, arsenic together with zinc in

⁴⁶⁰ R.T. Bierre (Inspector of Health) to Medical Officer of Health, Hamilton, 17 May 1979, Health Department, YCBE 1990/232c, ANZ-A.

⁴⁶¹ R. Davidson to M.B. Marks (Supervising Inspector, Department of Health, Hamilton), 29 June 1979, Health Department, YCBE 1990/232c, ANZ-A.

⁴⁶² *Te Aroha News*, 29 March 1979, p. 3.

concentrations which are above maximum levels set by the World Health Organisation for water supply purposes....

Over about ten years absolutely nothing has grown on the dump....

“A combination of inevitable high intensity storms and the total absence of vegetation steadily worsened the erosion to the point of being a definite threat to dam stability.”

He said control of this erosion proved a most difficult conservation problem and board staff investigation has therefore been a long story with the use of gravel (as a possible solution) finally emerging in March/April of this year.

“So serious was the gully erosion and stream pollution that an immediate decision was taken to utilise the gravel on the site,” he said. “From performance in recent storms it appeared that the Board has now achieved almost total control of the erosion and greatly reduced the flow of dumped materials into the stream.”...

Given sufficient neglect of the heap some trigger items [causing a ‘slush-out’] could be:

- * the heap is perched 300 metres up a steep mountain
- * the area is subject to very high intensity rainstorms
- * earthquakes are not unknown
- * the unpredictable nature of the heap if saturated through poor drainage and weakened by continued loss of the sand face
- * failure of the underground spring water drainage system...

[For the Mines Department] to insist that removal is practical and saving can be achieved at virtually no cost by use for horse racing tracks under the remote control of an inspector is totally unrealistic.

“It is also misleading in that it obscures the fact that the heap remains on the mountain side in sore need of attention and finance while the charade is maintained that the problem can be removed or will vanish at little or no cost if only all concerned would agree.

“I believe that the safe removal of the heap could only be achieved by an integrated engineering operation with close and continuous supervision and that it is in no way suited to casual low cost removal,” he said. “Costs would start at \$100,000 to \$200,000.”⁴⁶³

His recommendations, apart from the usual request for funds from the Minister of Energy, sought this minister’s support in ensuring that water and soil conservation values were ‘effectively protected in future mining

⁴⁶³ *Te Aroha News*, 19 June 1979, p. 1; for a fuller account, see R.W. Harris, Memorandum entitled ‘Mining in Coromandel-Kaimai-Mamaku Ranges with Particular Reference to Mt Te Aroha and the Tailings Heap’, 8 June 1979, HCB, Series 1, Box 206, 7/2, vol. 3, WRC.

privileges (both during and subsequent to prospecting or mining operations)'. A copy of his report was sent to the council,⁴⁶⁴ which still did not wish to meet any costs: its only acceptable solution was the complete removal of the tailings by and at the expense of the Mines Division.⁴⁶⁵

On 10 July staff of the board and the Mines Division met on site. Donald Carter of the former organisation reported that his samples taken in April indicated that the heavy metal content of the Tui Stream had 'influenced the Waihou'. After the visitors were shown how the face of the dam had been surfaced with half-inch quartz chips taken from the mill site, which had protected it from erosion during a recent storm, Harris 'said that the stability problem with the tailings dam was under control' to the board's satisfaction. He also reported having tried to plant on the south face of the dam, as recommended by Tonkin and Taylor: 'although an initial strike was gained the plants were eventually washed out'. He planned to build a spillway and drain as recommended, plus diversion drains on the ridge above the tailings to divert storm run-off; this would 'provide a permanent solution to the hazard of ponding on the surface'. Vegetation should be established on the southern half of the dam to prevent scouring. The Mines Division staff supported these plans, and it was agreed to take more water samples.⁴⁶⁶

After Jones visited the site in May he sought Palmer's opinion on Harris' proposal. He then informed the town clerk that Palmer claimed that he and a catchment board engineer had agreed some years ago on the 'obvious solution' that if water from the catchment was diverted around the dam by a ditch any danger would be avoided. Jones quoted Palmer's view that Harris' reluctance to remove the tailings because these would possibly pollute the environment was 'specious in the extreme'. Jones agreed with Palmer that there would be little pollution from sands being used on race tracks.⁴⁶⁷ What Jones did not repeat was the end of Palmer's letter in which

⁴⁶⁴ R.W. Harris, 'Mining in Coromandel-Kaimai-Mamaku Ranges with Particular Reference to Mt Te Aroha and the Tailings Heap', 8 June 1979, HCB, Series 1, Box 206, 7/2. vol. 3, p. 8, WRC.

⁴⁶⁵ *Te Aroha News*, 15 July 1979, p. 8.

⁴⁶⁶ A.K. Hartnett, Memorandum entitled 'Tui Mine, Te Aroha Tailings Dam', 20 July 1979, Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴⁶⁷ L.S. Jones (for Deputy Secretary of Energy (Mines)) to Town Clerk, 18 July 1979, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

this 'specious' comment was made. Palmer had written that the Mines Division

should not continue to pay for maintenance of a situation which is capable of early rectification. Any further discussion with the Board is useless - they are completely dominated by the opinions of the Chief Engineer to the exclusion of their own common-sense approach to the problem. Until they direct or approve that the sands be removed this sand bogey will not be laid.⁴⁶⁸

The Mines Division did not agree with Palmer's desire to remove the tailings totally, and in December Jones informed the town clerk that this was not 'a practical solution'.⁴⁶⁹ In August Harris complained that the board had been reimbursed only for the \$8,989 spent on the tailings up to 30 November 1977 and not for the \$21,404 subsequently spent. As well, he anticipated having to spend another \$30,000.⁴⁷⁰

Tests continued to be made of water quality by the Health Department. In August, a government analyst informed the Medical Officer of Health that two tests of water at the golf course revealed that 'the low pH of these waters may make them aggressive to metallic reticulations. Colour and turbidity may be objectionable', and the iron and manganese levels were 'excessive'.⁴⁷¹ After the visit of a senior Health Department official from Wellington, John Hugh Feltham, the council was advised not to use the Tui Stream because cadmium and lead were twice the World Health Organization levels.⁴⁷²

1980

⁴⁶⁸ A.G. Palmer to L.S. Jones, 15 May 1979, Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴⁶⁹ L.S. Jones to Town Clerk, Te Aroha, 20 December 1979, Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴⁷⁰ R.W. Harris to Secretary of Energy (Mines), 13 August 1979, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

⁴⁷¹ D.F. Nelson (Government Analyst) to Medical Officer of Health, Hamilton, 21 August 1979, Health Department, YCBE 1990/232c, ANZ-A.

⁴⁷² Record of J.H. Feltham's visit to Hamilton Health District, 21-22 August 1979, Health Department, YCBE 1990/232c, ANZ-A.

In 1980, the last year to be covered in this chronology, at a meeting of the executive committee of the board on 3 March Harris rather dramatically highlighted the lack of any resolution of the issues:

Remarks by Chief Engineer.

1. Drainage system for tailings pond failed recently in part, underlining the absolute need for constant maintenance.
 2. Neither Board nor Chief Engineer could or should be responsible in the continued absence of the drainage works for this pond (about \$15,000).
 3. All this has been before Mines Division.
 4. This situation, combined with the attitude of the Mines Division and the Lands Department over Amax, confirms that no progress whatsoever has been made on the acceptance of long term responsibility for rectifying mining damage. In my opinion this has frightening implications for the Thames Valley in view of the certain resurgence of mining.
 5. In addition the Chief Engineer is at a complete loss concerning recommendations concerning new mining ventures where the same old story seems to apply - i.e. (quote) "state your conditions."
 6. In opinion of Chief Engineer, there is a real danger that something will go wrong on the Mt Te Aroha tailings heap in the absence of a continuation of the works proposed by Board. Hence this means the possible failure of some part, great or small, of about 100,000 cubic metres of highly acidic materials. Should these reach the foot of the mountain, extreme damage will result with possible loss of life.
 7. It would be recommendation of Chief Engineer (1) that Board give serious consideration to a call for public enquiry into the whole matter, and (2) that Board approve immediately the expenditure of further Waihou Valley Scheme monies to ensure the continued safety of the heap meantime.
- Failing some positive action in this direction now, the Chief Engineer regrets that he is not able to accept any further responsibility for the safety of the structure or heap.⁴⁷³

Later the same month, the golf club again complained about pollution. Although town supply water was used for the clubhouse, water from the Tui Stream was used for summer irrigation of the greens, and in consequence 'vast areas' had become 'completely barren'. The greens were once regarded as the best in the Waikato and Thames Valley, according to the *Te Aroha News*, but ever since Norpac started mining the stream meandering

⁴⁷³ Agenda for Meeting of Executive Committee of Hauraki Catchment Board, 3 March 1980, Item 19 - Tui Mine, HCB, Series 1, Box 206, 7/2. vol. 3, WRC.

through the course had steadily become a darker brown and contained mineral waste. Thom, in his capacity as a longstanding member of the club, said this problem started about three years previously, caused by 'the greens receiving a build up of minerals' which did not wash off.⁴⁷⁴ In addition, 'local farmers found animals suffering from dehydration because of refusal to drink the water'.⁴⁷⁵ The club told the Mines Division that it had the moral obligation to accept responsibility and pay for mitigation.⁴⁷⁶ Because there was no response, in the following month a formal letter was sent asking for financial assistance to replace the water supply and the greens, plus compensation for lost tournament revenue caused by the pollution.⁴⁷⁷ A month later, Mato Brdanovic, the new Inspector of Mines, was asked to inspect the greens 'without prejudice' as the division had not 'accepted financial responsibility for any remedial work'.⁴⁷⁸ He reported that most of the greens were 'in quite a poor state. The brown turf has almost disappeared and in many places replaced by undesirable poa grass'. The greens 'were damaged by very acid water taken from the Tui stream for spraying'; as the Tui was very low in pH, the roots of the grass had been killed. The club had since moved its water intake to the north branch of the Tui, which was unpolluted, at a cost of nearly \$5,000, which they expected the Mines Department to help pay for.⁴⁷⁹ Whether this was agreed to is not recorded on this file.

In late 1980, Feltham discussed the pollution issue with the chairman of the Water Resources Council, who felt that 'adequate controls' could be imposed 'either under condition of water rights, mining rights or possibly by a bond system on the mining company'.⁴⁸⁰ Maurice Benjamin Marks,

⁴⁷⁴ *Te Aroha News*, 20 March 1980, p. 1.

⁴⁷⁵ 'Chronology of recent Mining Activity at Mt. Te Aroha', HCB, 60/11/04A, WRC.

⁴⁷⁶ D.G. Atkinson (Secretary, Te Aroha Golf Club) to Deputy Secretary of Energy (Mines Division), 21 March 1980, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

⁴⁷⁷ D.G. Atkinson to Deputy Secretary of Energy (Mines Division), 18 April 1980, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

⁴⁷⁸ L.S. Jones to Mato Brdanovic, 16 April 1980, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

⁴⁷⁹ Mato Brdanovic to L.S. Jones, 27 May 1980, Inspector of Mines, Box 16C, 13/11/E, vol. 2, MC.

⁴⁸⁰ D. Kettell to M.B. Marks, 1 October 1980, Health Department, YCBE 1990/232c, ANZ-A.

supervising inspector for the Department of Health in Hamilton,⁴⁸¹ noted in the margin of the letter reporting this view: 'What if Co goes bung'.⁴⁸² He made the same point more diplomatically by telling the Health Department that he was 'not satisfied' that a bond was a 'sufficient safeguard' unless it was 'backed by funds', for, quoting Norpac as an example, a company that became 'defunct' or went bankrupt could not be 'brought to account'.⁴⁸³

At the end of the year, under the headline 'Town Living in Fear of Toxic Waste', Dr Chris Hendy, a University of Waikato scientist who had tested the Tui Stream, was quoted as saying that 'a cubic centimetre of iron hydroxide sludge ... could give a person a lethal dose of cadmium poisoning'.⁴⁸⁴ Asked by Jones to check if this could be substantiated, Brdanovic discussed the article with Hendy, who explained that he was concerned with people drinking the water and with children playing in the stream. Brdanovic's view of the newspaper's 'unrealistic and even frightening' report was that he did not think that anyone would drink the water. The Tui Stream was not used for the water supply, nobody could drink 'a dangerous amount', and children would 'not eat the sludge'.⁴⁸⁵

The pollution continued to worry the council. In December, after reiterating that removal of the heap was the only 'completely acceptable' solution, the town clerk told the Minister of Energy, Bill Birch, that it was 'appalled' that a source of its water supply could 'be rendered unfit for human consumption by pollution and no party be legally responsible for providing compensation to assist with the location and establishment of alternative water supply sources'.⁴⁸⁶ The Mines Division continued to be unsympathetic, Jones telling Brdanovic that neither the Tui or Tunakohoa

⁴⁸¹ *Hamilton East Electoral Roll, 1981*, p. 66.

⁴⁸² Annotation by M.B. Marks, n.d., on D. Kettell to M.B. Marks, 1 October 1980, Health Department, YCBE 1990/232c, ANZ-A.

⁴⁸³ M.B. Marks (for Medical Officer of Health) to D. Kettell, 8 October 1980, Health Department, YCBE 1990/232c, ANZ-A.

⁴⁸⁴ *New Zealand Herald*, 12 December 1980, press cutting in Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴⁸⁵ L.S. Jones to Mato Brdanovic, 12 December 1980; Mato Brdanovic to Lloyd Jones, 16 December 1980, Inspector of Mines, Box 16A, 13/25-B, vol. 2, MC.

⁴⁸⁶ T.M. Williams (County and Town Clerk) to W.F. Birch (Minister of Energy), 1 December 1980, Inspector of Mines, Box 16B, 13/25-B, vol. 2, MC.

streams could be 'regarded as a possible potable water supply and in fact it may well be, never were'.⁴⁸⁷

In September, the last detailed article for 1980 in the *Te Aroha News* had a headline that explained why no lasting solution had been found: 'Who Will Pay?' There had been recent erosion of tailings and mining debris, and 'countless disused mines in a small stream' discharged silt into the pond, 'blocking flumes and culverts', polluting the Tui Stream and both branches of the Tunakohoia Stream. Trail bike riders and children playing on the tailings worsened the problem. Despite repeatedly seeking financial assistance, the catchment board had received only partial reimbursement. Jones admitted no progress had been made about who should meet the costs: this was 'out of my hands at the moment with our legal eagles and what not'. Eastwood said that there had been no communication from the Mines Division for six months. The golf club had had to tap a new source to irrigate its greens, 'at considerable expense'. The *Te Aroha News* had been given access to the 'battle of correspondence in the 1966/67 years', which revealed the 'underlying theme' that 'Norpac was a profit geared company unlikely to be interested in treading carefully in the Tui Valley'. Conditions imposed by the catchment board were ignored, and the paper argued that it was

unfair that the Catchment Board, which emphatically opposed the license being issued, was left to clean up the mess afterwards, and the Mines Division whose over-riding powers could have refused the license, or made sure the conditions were adhered to, can turn its bureaucratic back to the matter.

The article ended with a list of questions it wanted answered:

Why should ratepayers in the Thames Valley pay for work carried out by the Hauraki Catchment Board when they can ill-afford it? What power is given to central government authorities to stall, delay, and if they had their way completely, ignore requests from local authorities in the area acting on behalf of their ratepayers? When conditions are imposed on licenses of this kind, why aren't they policed, so when mining companies do go broke, the problem is not inherited by another party?

⁴⁸⁷ L.S. Jones to Mato Brdanovic, n.d. (received 29 December 1980), Inspector of Mines, Box 16B, 13/25-B, vol. 2, MC.

With the experience of Tui Mine, how can the Mines Division seriously entertain granting licenses for companies to prospect in the Kaimai range, as is currently being considered?⁴⁸⁸

COPING WITH NORPAC

In 1985, when looking back over the Norpac years, Donald McConnochie, the deputy mayor from 1965 to 1974, noted such problems as the grass on the golf course turning black and dying when irrigated with water from the Tui Stream. 'From the time pollution started I am aware that the executive officers of the Borough approached the Mines Department time and again to do something about the pollution, but always reported back the same result, that the Mines Department were reluctant to do anything to help'. The siphoning in late 1968 of tailings water into the stream 'was typical of the sort of thing that Norpac did when they were not being policed. Norpac made excuses about this and said that they intended expenditure'. One fundamental point he made was that, while the council was unhappy about pollution, 'it did not want to get heavy with Norpac as they did not want Norpac to close down. The Borough was really in a cleft stick about the matter'.⁴⁸⁹ The government likewise had always wanted the mine to operate.⁴⁹⁰

Harris in his June 1979 report on Norpac described his attempts to impose controls:

It is a fact that Board received little support, either locally or at Government level, with the result that while some specific conditions requested by Board concerning rock waste etc were imposed virtually none of Board's conditions relating to the tailings dump were approved. Moreover it became clear that any conditions that might affect the economy of the operation would not be welcome. [When Norpac collapsed], most of Board's worst fears [were realized].⁴⁹¹

⁴⁸⁸ *Te Aroha News*, 18 September 1980, p. 1.

⁴⁸⁹ Statement by Donald K. McConnochie, 7 June 1985, pp. 2, 6, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

⁴⁹⁰ Interview with Sam Guernier, Te Aroha, 18 August 2001.

⁴⁹¹ Report by R.W. Harris, 'Mining in Coromandel-Kaimai-Mamaku Ranges with Particular Reference to Mount Te Aroha and the Tailings Heap', 8 June 1979, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

In December 1980, Harris said that the government had ‘shunned responsibility for the problem’, adding that ‘there was a serious risk that other active mining operations could end up the same way’. The worst feature was that ‘the catchment board warned the community years ago but had not received any support.’⁴⁹²

Could the problem have been solved by selling the tailings? Handcock, before he left Norpac’s employ to work in Australia, told Lynam that he had planned for the tailings pond becoming 12 metres higher than attained and stated it would be too expensive to remove them.⁴⁹³ But in 1983, when the local Member of Parliament discussed the problem with him in Australia, he maintained ‘that the stockpile would be ideal material for road foundation work. The product would also be very suitable as a concrete aggregate’.⁴⁹⁴ The officials’ response, when this suggestion was put to them, was that while it was ‘not a particularly difficult process’ to remove the slimes from the sands, the difficulty in extracting usable material coupled with transport costs had ‘not made the use of the tailings an attractive proposition’.⁴⁹⁵ The suggestion about using the sand for concrete had been tried and found not to work, for the tailings reacted with the cement; pollution worries prevented its use for roads. Some Te Aroha residents did surreptitiously remove some sand for their driveways, and were pleased to find that no weeds grew on them thereafter.⁴⁹⁶

Whilst Norpac did not set out to create pollution, it did not want to spend more than absolutely necessary on preventing this because its operation was always financially marginal. Prompting and supervision by regulatory authorities helped to ensure that an adequate dam was built, but the tailings were more toxic than anticipated. Local authorities were concerned about the effects of mining, and their worst fears were realized.

THE NORPAC LEGACY

⁴⁹² *Hauraki Herald*, 13 December 1980, p. 43, in scrapbook of newspaper cuttings compiled by J.H. Lynam.

⁴⁹³ Interview with J.H. Lynam at Te Aroha, 1 July 1995.

⁴⁹⁴ J.F. Luxton to W.F. Birch, 10 August 1983, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

⁴⁹⁵ W.F. Birch to J.F. Luxton, 2 September 1983, Te Aroha Borough Council, A/16/6/1, Matamata-Piako District Council Archives, Te Aroha.

⁴⁹⁶ Interview with J.H. Lynam at Te Aroha, 1 July 1995.

Subsequent to the Tonkin and Taylor report of 1977, remedial action was taken. The dam face was 'fully covered with gravels to prevent further gullyng during heavy rain', stream erosion downstream of the dam was arrested by new gabions, and pipes under the road were 'replaced to bring decant system into proper working order'. To improve the drainage, surface water from the mining site above the tailings were 'collected and diverted away from the tailings dam', and 'shallow surface drainage was constructed on the 'tailings floor to prevent ponding'. Drainage was constructed at the head of the dam 'to collect and remove an subsurface flows resulting from raised water-tables during prolonged wet periods'. Borough staff checked the site weekly as well as 'during and following any heavy rainfall' to ensure drainage channels were kept open and erosion prevented. The Ministry of Works and Development visited quarterly, 'or by special request, to monitor ground water levels'.⁴⁹⁷ This ministry revised Tonkin and Taylor's inspection plan of the tailings to include new recommendations for improving the drainage.⁴⁹⁸ As before, there were periodic alarms, as for instance in June 1983, when a routine inspection after heavy rain revealed much increased seepage, exceeding the capacity of the decant pipe of 60 litres per second. The new chief engineer of the catchment board, David Howie Smith,⁴⁹⁹ considered this 'dramatic' change to be 'the most serious and urgent problem which has arisen in connection with this tailings heap to date'. He feared it would collapse because whereas previously water was diverted from the tailings, the heap was 'obviously being progressively saturated from its upstream end by the inflow of water through the existing ground'.⁵⁰⁰ The danger was not as great as Smith believed, but the heap's existence continued to worry engineers and residents alike.

⁴⁹⁷ Te Aroha Borough Council, undated memorandum [January 1986], A/26/6/1. Matamata-Piako District Council Archives, Te Aroha.

⁴⁹⁸ 'Tui Mine Tailings: Inspection Plan and Notes', prepared by M.W.D., District Office, Hamilton, based on Tonkin & Taylor Drawing 2472-1, 9 April 1974, annotated during inspection on 13 September 1985, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

⁴⁹⁹ *Hauraki Electoral Roll, 1983*, p. 93.

⁵⁰⁰ D.H. Smith (Chief Engineer, Hauraki Catchment Board) to Mato Brdanovich, 15 June 1983, Te Aroha Borough Council, A/26/6/1, Matamata-Piako District Council Archives, Te Aroha.

Continuing investigations into the content of the heap and its downstream impacts raised awareness of the legacy of Norpac's mining.⁵⁰¹ In August 1981 Chris Hendy published findings based on his own monitoring of the Tui and Tunakohia Streams and the work of a graduate student. Drainage from No. 5 drive and the tailings pond exceeded the World Health Organisation's limits for drinking water by up to ten times for zinc, up to 14 times for cadmium, up to 19 times for copper, and up to 1,300 times for iron; and the tailings drainage fell 'well outside the range of acceptable pH values'. As well, there were 'other serious environmental problems':

Firstly oxidation of ferrous iron to ferric iron in the Tui Stream, and a gradual rise in pH by dilution of the tailings discharge waters, resulted in precipitation of ferric hydroxide in the stream bed. This acted as a scavenger removing some of the toxic heavy metals from solution to form a toxic sediment in the stream bed.... This sediment forms a particularly toxic solid which is easily accessible to the general public and is within 100 metres of a housing area. In my opinion, this constitutes a serious health hazard to children playing in the stream.

The stream was 'devoid of even algae', and after eight years no plants had grown on the surface of the tailings, despite the catchment board sowing grass seed.

⁵⁰¹ See N.E. Ward, R.R. Brooks, R.D. Reeves, 'Copper, Cadmium, Lead, and Zinc in the Soils, Stream Sediments, Waters, and Natural Vegetation around the Tui Mine, Te Aroha, New Zealand', *New Zealand Journal of Sciences*, vol. 19, (1977), pp. 81-89; Kim Ann Tay, 'Geochemistry and Environmental Impact of the Discharge of Heavy Metals from the Tui Mine and its Tailings' (MSc thesis, University of Waikato, 1990), especially pp. iii-v, 60, 183-186; Liping Pang, 'A Hydrogeological Study of Heavy Metal Contamination in the Groundwater of the Te Aroha Area' (MSc thesis, University of Waikato, 1992), especially pp. 152-158; Liping Pang, 'Contamination of Groundwater in the Te Aroha Area by Heavy Metals from an Abandoned Mine', *Journal of Hydrology New Zealand*, vol. 33 no. 1 (1995), pp. 17-33; Hutham Sabti, Mohommad M. Hossain, Robert R. Brooks, Robert B. Stewart, 'The Current Environmental Impact of Base-Metal Mining at the Tui Mine, Te Aroha, New Zealand', *Journal of the Royal Society of New Zealand*, vol. 30 no. 2 (2000), pp. 197-208; Sarah Ann Harvey, 'Assessment of Environmentally and Publically Acceptable Options for Remediation at Tui Mine Site, Te Aroha' (MSc thesis, University of Auckland, 2003), pp. 6, 19-20, 27-30, 35, 48, 59, 88, 91, 113-114, 125-125.

Heavy metals released into water supplies often have far-reaching and drastic effects on aquatic and marine life. Some elements, such as cadmium, are preferentially accumulated by filter-feeding shellfish such as oysters. This can result in cadmium concentrations in the shellfish reaching toxic levels for humans. Other elements such as mercury are preferentially accumulated in body fats and at each stage along the food chain become further enriched. This places carnivorous fish, which made up a large proportion of the commercial fish harvest, at risk and places domestic and export fisheries in jeopardy.⁵⁰²

As this was published in an environmental journal, this might be seen as preaching to the converted, who might not consider whether people were unlikely to drink water where it came out of a mine or a tailings pond, but periodically such issues were raised in newspapers as well.

The main legal issue after Norpac collapsed was to decide which agency was responsible for the tailings, a question raised early in the discussions but never resolved because whichever body accepted responsibility would be expected to meet the cost of stabilizing or removing them. The government did not want to shoulder the financial cost. For instance, in early 1981 Birch, responding to a request to contribute to the cost of stabilizing the tailings and reducing the pollution, in his cautious words, 'apparently caused', sought legal advice, which argued that the government had 'no legal liability to meet such compensation claims'. However, he promised to investigate whether he could assist.⁵⁰³ He then offered, in February 1981, to meet half the \$50,000 cost, but added the 'rider that this was the limit of government contribution toward costs incurred'.⁵⁰⁴ By September 1982, when the cost of removal had risen to over \$1 million and of stabilisation at \$63,000, Birch offered to meet 70 percent of the latter, if the catchment board and borough council each found \$9,500: they claimed they could not.⁵⁰⁵ Which meant that the issue remained unresolved.

⁵⁰² C.H. Hendy, 'The Tui Mine – After the Miners have Left', *New Zealand Environment*, no. 29 (August 1981), pp. 18-19.

⁵⁰³ W.F. Birch to T.M. Williams, 20 November 1980, HCB, 60/11/04A, WRC.

⁵⁰⁴ W.F. Birch to R.W. Harris, n.d. [received 19 February 1981], HCB, Series 1, Box 206, 7/2, vol. 3, WRC.

⁵⁰⁵ *Waikato Times*, 17 September 1982, p. 5.

(The legal reasoning behind this refusal to accept responsibility was that the special site licenses were invalid because they were not issued over ‘unalienated Crown land’. Accordingly there could be no valid claim for compensation. Crown Counsel noted that the licenses were granted at the request of the borough council, and that, even if they were valid, the Crown could not be sued, for Norpac, not the Crown, had caused the damage.⁵⁰⁶ In addition, the pit was on borough land, the council had made the agreement with Norpac, and it had received the license fees.)⁵⁰⁷

LONG-TERM CONSEQUENCES FOR ENVIRONMENTAL PROTECTION

In his ‘Report on the Preservation of the Quality and Availability of the Waters from the Coromandel-Kaimai-Mamaku Ranges’ dated 30 August 1977, Harris touched on the impact of mining. He considered the situation at Te Aroha was ‘particularly unfortunate’, for two mining ventures had ‘created a situation where large quantities of sediment have been washed into the tributary streams, quite apart from the tailings dump’. Mining in these ranges was always likely to threaten water quality. Conditions imposed were administered through the Mines Department, and ‘no matter how sincerely accepted by the Mines Department and the applicant, can easily turn out to be impracticable, ineffective, difficult to enforce or police, “uneconomic,” and so on’. As the catchment authority had the statutory duty to protect the water, any mining permitted needed

to be of such value to New Zealand as a whole, as to justify overriding any risk to the Water Resource, and to warrant a Government Guarantee that whatever precautions needed would be taken (even if expensive), or, alternatively, that the loss of, or damage to, the Water Resource, made good in some other way.

⁵⁰⁶ P.J.H. Jenkin (Crown Counsel) to Secretary of Energy, Mines Division, Ministry of Energy, Mines Department, MD 1, 12/46/1038, held by Ministry of Commerce, Wellington.

⁵⁰⁷ P.J.H. Jenkin to Minister of Energy, 4 November 1982, Mines Department, MD 1, 12/46/1038, held by Ministry of Commerce, Wellington.

The small-scale mining of the past 20 years should not be supported.⁵⁰⁸ The catchment board agreed with Harris' analysis, and in March 1980 advised the Mines Division of four policies it had devised for future mining operations. The first was that mining would only be permitted in the Kaimai ranges if it would be of such economic value to New Zealand as a whole that the risk to water resources was justified. Secondly, the costs of restoring these resources after mining ended would be met by the mining company, under a guarantee by the Mines Division. Thirdly, conditions would be placed on all mining, and lastly, none would be permitted in any catchment used for specific water supply.⁵⁰⁹ The Mines Division agreed in general to the tighter conditions proposed, and also that 'in specific instances it may be advisable to incorporate conditions in a title requiring payment of a substantial bond as security for compliance by the licensee with the conditions of the title'.⁵¹⁰ The board applauded this suggestion of a large bond and felt that it should be required even at the prospecting stage in some instances. In addition, it suggested that because of 'the incompatibility of mining with the adequate supply of high quality water to the Thames Valley and the Coromandel Peninsula' all prospecting applications should include an environmental impact report.⁵¹¹ In this manner policy was developed that would be applied to mining throughout New Zealand.

Unwillingness to provide the funds needed to remove the tailings meant that the issue was never resolved, and it continued to be a problem for local authorities and a horrible example for environmentalists. For instance, on 26 May 1982 Brian Dixon, co-ordinator of Waikato Watchdog, a group opposed to mining, spoke to the Te Aroha Jaycees. He 'presented the major arguments against large-scale mining using the Te Aroha Tui Mine as an example (the Tui mess is a miniature-scale warning of the dangers of present threats)'.⁵¹² This organization also noted that 'the Norpac partners

⁵⁰⁸ R.W. Harris, 'Report on the Preservation of the Quality and Availability of the Waters from the Coromandel-Kaimai-Mamaku Ranges', 30 August 1977, pp. 7, 15, Ministry of Works, ABWN 6095, 15/244/14, Part 2, ANZ-W.

⁵⁰⁹ J.M. Morrison (Secretary, Hauraki Catchment Board) to Deputy Secretary of Energy (Mines Division), 12 March 1980, HCB, 60/11/04A, WRC.

⁵¹⁰ R.W. Byrne (for Deputy Secretary of Energy (Mines)) to J.M. Morrison, 28 April 1980, HCB, 60/11/04A, WRC.

⁵¹¹ J.M. Morrison to R.W. Byrne, 26 July 1980, HCB, 60/11/04A, WRC.

⁵¹² *Waikato Watchdog Newsletter*, June 1982, p. 2.

have escaped liability although all have survived and some are active in other mining ventures!’⁵¹³ *Mining Monitor* in 1982 warned the ratepayers of New Zealand of the Norpac example of leaving tailings behind to be looked after by them. ‘A key issue for local bodies dealing with multinational mining companies is how to force those companies to be responsible for their wastes for many years after the mine has been closed and the company has moved on’.⁵¹⁴ In a 1984 article entitled: ‘Tui Tailings: Setting the Record Straight’ it noted that ‘not only was no bond ever charged for Tui, but Mines Division did not begin to levy bonds until after the 1981 law change’.⁵¹⁵ ‘The question of who is responsible for the mess that the Norpac operators walked away from remains the centre of controversy. Is it the Government which issued the licence, the Borough that owns the land, or the Catchment Board which has responsibilities for the water and soil values of the area’.⁵¹⁶ It pointed out that landowners were responsible for tailings left on their land even if they had been ‘opposed to the grant of licences in the first place!’.⁵¹⁷

The only guidance the law gives as to the regulation of tailings is the stunningly inadequate piece of information contained in the Mining Regulations to the effect that if you, as owner of a Mining licence allow tailings to go over the boundary of the Mining licence you hold, then the tailings aren’t yours any more!⁵¹⁸

In part because of the legacy Norpac bequeathed to the district, mining companies and their supporters were forced to admit that better environmental protection was needed. Gil Fletcher, an Australian-based ‘environmental agronomist’ employed by Amax Exploration (N.Z.) Ltd, in January 1981 told a newspaper that modern mining must meet the environmental conditions imposed. The only recent example in New Zealand was ‘perhaps the Tui Mine, at Te Aroha, and it was obvious this was a matter of concern in the reference to metal-contaminated tailings’.⁵¹⁹ In its June 1983 submission to the Thames Valley United Council Mining

⁵¹³ *Waikato Watchdog Newsletter*, October 1982, p. 3.

⁵¹⁴ *Mining Monitor*, issue 25 (18 November 1982), p. 4.

⁵¹⁵ *Mining Monitor*, issue 52 (27 May 1984), p. 2.

⁵¹⁶ *Mining Monitor*, issue 52 (27 May 1984), p. 3.

⁵¹⁷ *Mining Monitor*, issue 52 (27 May 1984), p. 4.

⁵¹⁸ *Mining Monitor*, issue 52 (27 May 1984), p. 4.

⁵¹⁹ *Bay of Plenty Times*, 9 January 1981, p. 1.

Study by Metallum Research Ltd, 'Independent Geological Consultants and Contractors' of Thames, it was admitted that mining had been criticised 'for alleged environmental damage'. While this firm conceded that there had been errors in the past, 'generally' these had been 'errors of ignorance, or the result of ill-conceived regulation – for example the option under the 1926 Mining Act whereby companies could pay either £7 10s an acre compensation or restore the land. They invariably chose the cash option'.⁵²⁰ It noted that the Mining Amendment Act of 1981 had introduced 'formal consultation with territorial authorities on economic social and environmental effects of prospecting and mining proposals on districts', and had established a new procedure for dealing with objections.⁵²¹ This Act had certainly made changes, based on discontent with the former procedures expressed in some parts of the country, notably Coromandel,⁵²² although the worries about mining in the Kaimai ranges must in part have referred to concerns felt at Te Aroha.⁵²³

In introducing that legislation, Bill Birch, the Minister of Energy, stressed that it required that applications for a prospecting and mining licenses must be accompanied by environmental assessments. Clause 5 added to the conditions currently imposed on these licenses the requirement to take 'all necessary steps' to 'prevent damage to features of scientific, wildlife, fishing, or historic interest, or of special visual appeal'. Clause 19 added five new sections dealing with the protection of land, the most important 'undoubtedly' being section 103C, which for the first time provided 'for the territorial authority to give its views on applications for mining privileges, other than exploration licences and prospectors' rights'. The local authority would be able to give its opinion on whether the license should be granted and any conditions to be attached if it was, 'having regard to the economic, social, and environmental effects of the proposal on its district'. The Minister was required 'to have regard to these recommendations in dealing with the application'. Clause 23 brought

⁵²⁰ Metallum Research Ltd, Submission to Thames Valley United Council Mining Study, 3 June 1983, p. 10, Commerce Department, AATJ 6090, W4993/11, 3/104, Part 1, ANZ-W.

⁵²¹ Metallum Research Ltd, Submission to Thames Valley United Council Mining Study, 3 June 1983, p. 20, Commerce Department, AATJ 6090, W4993/11, 3/104, Part 1, ANZ-W.

⁵²² For example, Mike Moore, *New Zealand Parliamentary Debates*, 13 October 1981, vol. 442, p. 4074.

⁵²³ See mention of Kaimai area by Michael Minogue, *New Zealand Parliamentary Debates*, 16 July 1981, vol. 438, p. 1603.

together 'the provisions scattered throughout the Act regarding deposits or bonds to be lodged as security for compliance' with the conditions. Clause 25 made the planning tribunal the forum for hearing objections against the grant of a mining privilege, the criteria again including the economic, social, and environmental effects. Birch stated that he sought to bring the legislation 'more in line with the environmental planning and water and soil legislation' that had evolved over the past decade. The views of environmental groups, local authorities, Federated Farmers, the mining industry, and 'the concerned public' had been obtained, and the legislation proposed 'a middle course, bearing in mind the importance of maintaining a viable mining industry in New Zealand', and ensuring that it was 'both practical and workable'.⁵²⁴

The Labour Party wished the bond to be compulsory 'to cover any damage that might have to be made good'.⁵²⁵ One National Member of Parliament, Michael Minogue, noted that with the rise in the price of gold and other minerals, low-grade ore would be mined using opencast methods:

People rightly discerned that that could have a very damaging effect on the local environment, particularly in the Coromandel and the Kaimai areas, where there is very heavy rainfall over short periods. It was foreseen that mining could lead to considerable erosion, contamination of local water supplies, and ecological damage of various kinds.⁵²⁶

Ian Shearer, Minister for the Environment, referred to criticism from local bodies about their having 'mining schemes foisted on them without any opportunity to comment, and without any right of appeal through the courts', considered the new legislation 'a radical departure' that brought the Mining Act 'away from the 1970s and into the 1980s'.⁵²⁷ Only one member, in referring to the need to restore the land 'to its original state' and therefore largely 'satisfying environmental concerns', raised the problem of many overseas companies being subsidiaries of overseas one. 'If the New Zealand company folded, that would eliminate the ongoing responsibility to restore any damage that might have occurred'.⁵²⁸

⁵²⁴ *New Zealand Parliamentary Debates*, 16 July 1981, vol. 438, pp. 1598-1600.

⁵²⁵ Bob Tizard, *New Zealand Parliamentary Debates*, 16 July 1981, vol. 438, p. 1602.

⁵²⁶ *New Zealand Parliamentary Debates*, 16 July 1981, vol. 438, p. 1602.

⁵²⁷ *New Zealand Parliamentary Debates*, 16 July 1981, vol. 438, p. 1606.

⁵²⁸ Mel Courtney, *New Zealand Parliamentary Debates*, 16 July 1981, vol. 438, p. 1614.

After its introduction, the bill was considered by the Commerce and Energy Committee, which received 215 written submissions, many of which were supported by personal appearances before the committee. Amongst the concerns covered were ‘the need for adequate bonds or deposits, and for those to be applied, first, towards damage arising from mining’.⁵²⁹ During this select committee stage, as Birch was pleased to note, all the MPs agreed to the changes proposed.⁵³⁰ Birch explained that the procedures in Clause 23 relating to the bond had been rewritten ‘to make it clear’ that the bond was ‘to be applied first in the restoration of any damage caused by breach of conditions, and additionally to allow applications of those moneys towards damage occasioned by the mining operations’. All or part of the bond could be retained after these had been completed for ‘such further work’ might be necessary.⁵³¹ On behalf of the Opposition, Bob Tizard stated that ‘most people’ would applaud this arrangement:

Reassurance should be given to New Zealanders, particularly when an overseas company is involved. A lot of evidence was presented by the local body representatives about the effect of past mining.... There is no doubt that in some parts of the country mining has, in the past, done serious damage, and local authorities do not have the funds to restore the areas.⁵³²

In 1983, the select committee considering the Mining Moratorium Bill on the Thames-Coromandel received a submission from the Physical Environment Association of the Coromandel opposing all mining on the peninsula. ‘Recent prospecting and mining has made its presence felt in a sporadic way on the Coromandel and while money has been made, destructive wastes have been left behind, for example the Tui Mine at Te Aroha’.⁵³³ This was one of the rare occasions when this mine was mentioned explicitly; it was usually a background to the opinions expressed.

In May that year, the Thames Valley United Council sought submissions for its Regional Mining Study. Seventy-four were received,

⁵²⁹ Bill Birch, *New Zealand Parliamentary Debates*, 13 October 1981, vol. 442, p. 4063.

⁵³⁰ *New Zealand Parliamentary Debates*, 13 October 1981, vol. 442, p. 4082.

⁵³¹ *New Zealand Parliamentary Debates*, 13 October 1981, vol. 442, p. 4064.

⁵³² *New Zealand Parliamentary Debates*, 13 October 1981, vol. 442, p. 4066.

⁵³³ ‘Statement to the Select Committee of the Mining Moratorium Bill on the Thames-Coromandel by the Physical Environment Association of the Coromandel (Incorporated)’, August 1983, Ministry of Commerce, AATJ 6090, W4993/11, 3/104, Part 2, ANZ-W.

expressing a general concern for protecting the peninsula. The Norpac legacy was explicitly mentioned by only three submitters apart from the Te Aroha Borough Council: even Peninsula Watchdog, Watchdog (Waikato), and the South Auckland Conservation Association did not use it as an illustration, even though it was one of the main causes of their concerns. Carl Jensen, a consultant geologist and drilling consultant, submitted that 'the recent commercial extraction under a prospecting license at Waihi and the Tui Mine tailings dump illustrate the need for effective control of mining activities'.⁵³⁴ The Physical Environment Association submitted that 'the quality of water available to residents and horticultural projects' was 'very important'. Any future mining must make adequate provision to prevent contamination of water, with funds provided to the catchment board for adequate testing. 'The example of the Tui Mine Tailings Dam cannot be repeated'.⁵³⁵ R.J. Nicholls of the Paeroa office of the Ministry of Works and Development was also concerned about water quality. 'For example the Te Aroha Borough Council has had to change its source of water due to pollution of Tui Stream from mining activities in that catchment'. Toxic wastes continued to pollute waterways 'for many years after the operation has ceased', and he cited Hendy's testing of the water coming from the tailings as evidence.⁵³⁶ The catchment board merely asked the study to consider 'the vulnerability of different areas to soil erosion', and to produce a map showing the environmental dangers of developing resources.⁵³⁷

The borough council's planning consultant, Matheson and Stewart, a Te Aroha firm, produced a report that was approved by the council's

⁵³⁴ Carl J. Jensen, submission to Thames Valley United Council, Regional Mining Study, 2 June 1983, p. 21, Regional Mining Study file, Ministry for the Environment Library, Wellington.

⁵³⁵ Submission by the Physical Environment Association of the Coromandel, n.d. [received 8 June 1983], Ministry of Commerce, AATJ 6090, W4993, box 11, 3/104, Part 1, ANZ-W.

⁵³⁶ R.J. Nicholls (Ministry of Works and Development, Paeroa Office) to District Commissioner of Works, Hamilton, 2 June 1983, Regional Mining Study file, Ministry for the Environment Library, Wellington.

⁵³⁷ D.H. Smith (Chief Engineer, Hauraki Catchment Board and Regional Water Board), to Regional Planner, Thames Valley United Council, 3 June 1983, Ministry of Commerce, AATJ 6090, W4993, box 11, 3/104, Part 1, ANZ-W.

planning committee.⁵³⁸ After noting ‘the political motivations of environmental groups for impeding the mining industry’, the report assessed the legislation as amended in 1981. Requiring environmental assessments when applying for licenses, protection of ‘areas of established scientific, wildlife, fishing or historic interest or established scenic significance’, the imposition of conditions to prevent or reduce or make good impacts on the environment, increased input by local authorities, and general oversight by the Planning Tribunal with increased entitlement for local bodies, the catchment board, and individuals to object made it ‘unlikely that a Tui Mine tailings situation could occur’ again. It identified nine issues that should be considered:

1. Identification of mineral resources in the district showing old workings.
2. Identification and protection of Borough water supply catchment and reticulation (already noted in Kaimai-Mamaku State Forest management plan.)
3. Identification of mountain streams traversing Borough and protection of their catchments from pollution, siltation, slippage, defoliation or any other damage likely to result from mining operations.
4. Because of known mineral resources, that areas suitable for ancillary mining processing be identified having regard to roading, servicing and amenity requirements. Input from the mining industry could be invaluable in determining this question.
5. Preservation and lack of interference with thermal springs in the Te Aroha Domain which are a key amenity to a developing tourist industry.
6. Protection of slopes of Mount Te Aroha as a visual backdrop to the town.
7. Protection of recreation reserves and school grounds within the Borough.
8. Identify and protect natural wildlife habitats within Borough and fishing in Waihou River.
9. Identify and protect sewerage treatment works and reticulation.

After offering assistance by providing data, the report concluded:

Te Aroha, as an early mining town, has empathy with the mining industry and has in a recent decade had an operational mine

⁵³⁸ T.M. Williams to Regional Planning Officer, Thames Valley United Council, 26 May 1983, Regional Mining Study file, Ministry for the Environment Library, Wellington.

contributing to the livelihood of the community. The aftermath of that activity has, however, not proved acceptable. Recent changes in the legislation to enable the setting of mining operating conditions give confidence that the potential benefits of a renewed mining industry based on Te Aroha could be realized.⁵³⁹

The report, published in June 1984, made explicit reference to the influence of Norpac's mine in changing rules relating to mining:

One of the major reasons for public objections to prospecting and mining in the Coromandel Peninsula is the fear that the effects of mining will be severely detrimental to the local environment, which has high scenic, habitat, and recreational value. This fear of the potential for severe damage has not been alleviated by the environmental damage problems of the Tui mine at Te Aroha. Although the Tui mine situation is never likely to happen again, and thus represents the worst case scenario, it does demonstrate the potential for damage if stringent environmental controls are not applied.⁵⁴⁰

Senior officials of the Mines Division annotated the recommendations from this study. Where the first point of the 'Suggested Work Programme' stated that 'Mining and Mineral processing activities have the potential to adversely impact on the environment', the word 'potential' was underlined with the annotation: 'only – should not occur with modern techniques etc'.⁵⁴¹ The report recommended that 'clear and strict environmental controls and guidelines' should be 'urgently developed to minimize this risk'; the officials agreed with the concept and the actions listed.⁵⁴² They agreed with recommendations for further research into water quality and areas of 'environmental sensitivity', but were against closing off the peninsula to

⁵³⁹ G.R. Matheson to T.M. Williams, 20 May 1983, appended to T.M. Williams to Regional Planning Officer, Thames Valley United Council, 26 May 1983, Regional Mining Study file, Ministry for the Environment Library, Wellington.

⁵⁴⁰ Thames Valley United Council, *Regional Mining Study, Stage 1, June 1984: vol. 2: Resource Discussion and Analysis*, prepared by Gabites Porter and Partners, p. 15.

⁵⁴¹ Thames Valley United Council, *Regional Mining Study, Stage 1, June 1984: vol. 1: Summary Report*, prepared by Gabites Porter and Partners, p. 39, Ministry of Commerce, AATJ 6090, 3/104, ANZ-W.

⁵⁴² *Regional Mining Study: vol. 1*, pp. 39-40, Ministry of Commerce, AATJ 6090, 3/104, ANZ-W.

mining, preferring controls to prohibition.⁵⁴³ Recommendation 26 was implicitly based on the experience of the Norpac mine:

The legislative responsibilities for administering and enforcing regulatory requirements and conditions for mining operations are not clear and there appear to be numerous anomalies. This is to be expected given the recent lack of a developed mining industry in New Zealand. Appropriate controls are usually developed over a long period as the industry evolves. However the potential for serious environmental damage due to inadequate legislation is considerable and high priority should be given to delineating a more appropriate legislative framework (in terms of controls, responsibilities, ability to police and enforce etc).⁵⁴⁴

CONCLUSION

The debate over how to avoid or limit the environmental impacts of mining continues, with the example of the Norpac mine at Tui still being relevant to the discussion. Until 2013, when the tailings were completely stabilized at last and the adits were blocked to stop polluted mine water entering the mountain's streams, it continued to be of great concern to the local community, and it remains an example to environmentalists of what should never happen again.

Appendix

Figure 1: Norpac, plan attached to application for Mineral License, 18 May 1966, showing roads and reefs, Te Aroha Warden's Court, Mining Applications 1966, 8/1966, BCDG 11289/6a, ANZ-A [Archives New Zealand/Te Rua Mahara o te Kawanatanga, Auckland Regional Office]; used with permission.

Figure 2: Norpac, plan attached to applications for Special Site, 1 September 1966, showing drainage, buildings, rock storage area, mill site, and tailings area, Te Aroha Warden's Court, Mining Applications 1966, 13/1966, BCDG 11289/6a, ANZ-A [Archives New Zealand/Te Rua Mahara o te Kawanatanga, Auckland Regional Office]; used with permission [in three sections because of size of the original].

⁵⁴³ *Regional Mining Study: vol. 1*, p. 40, Ministry of Commerce, AATJ 6090, 3/104, ANZ-W.

⁵⁴⁴ *Regional Mining Study: vol. 1*, p. 45, Ministry of Commerce, AATJ 6090, 3/104, ANZ-W.

Figure 3: 'Objector's Plan', August 1969, attached to 'Application for Tail Race License, Mt Te Aroha, Norpac Mining Limited, Decanted Waste Water Disposal', 30 June 1969, Te Aroha Warden's Court, Mining Applications 1969, 5/1969, BCDG 11289/6a, ANZ-A [Archives New Zealand/Te Rua Mahara o te Kawanatanga, Auckland Regional Office]; used with permission.

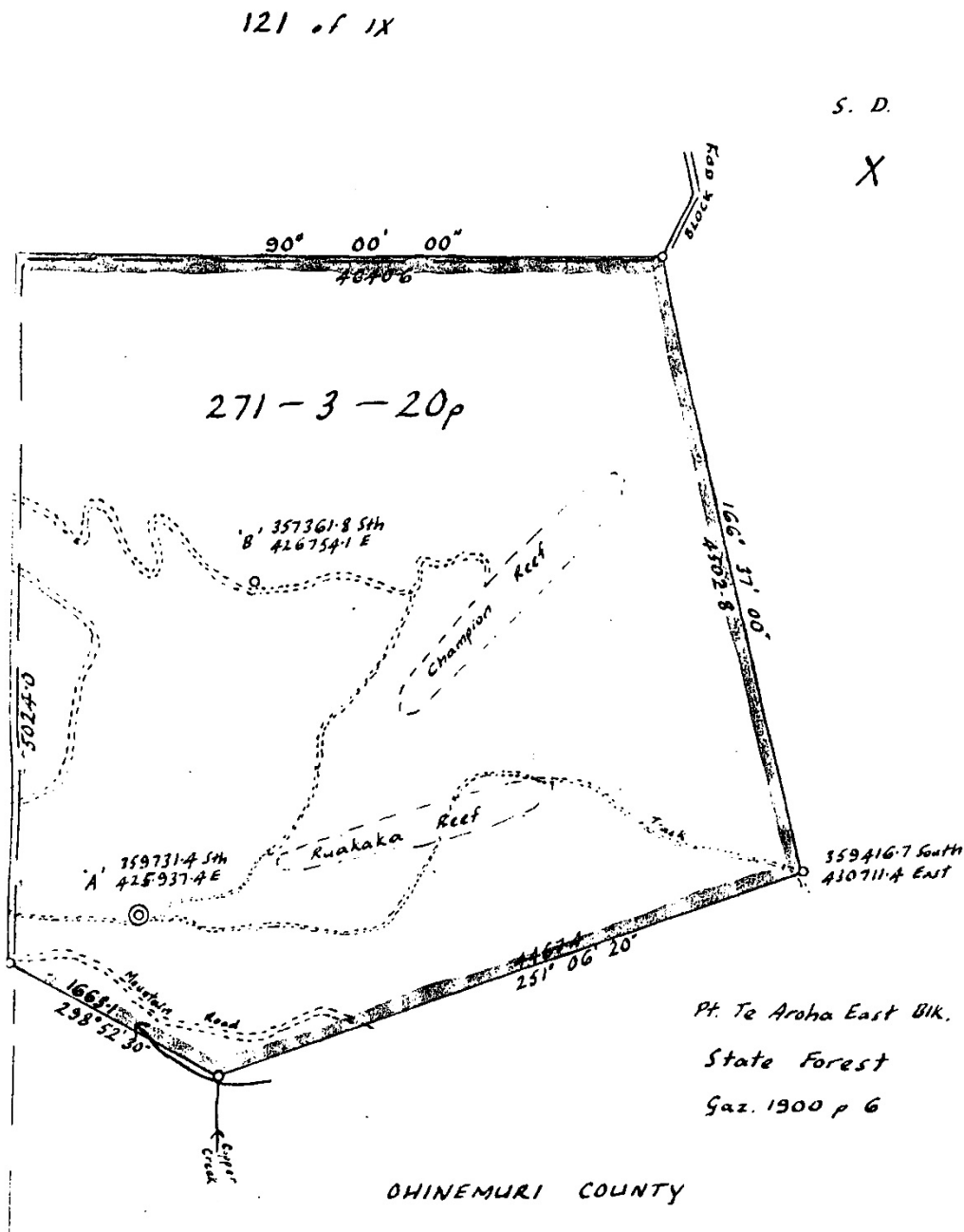


Figure 1: Norpac, plan attached to application for Mineral License, 18 May 1966, showing roads and reefs, Te Aroha Warden's Court, Mining Applications 1966, 8/1966, BCDG 11289/6a, ANZ-A [Archives New Zealand/Te Rua Mahara o te Kawanatanga, Auckland Regional Office]; used with permission.

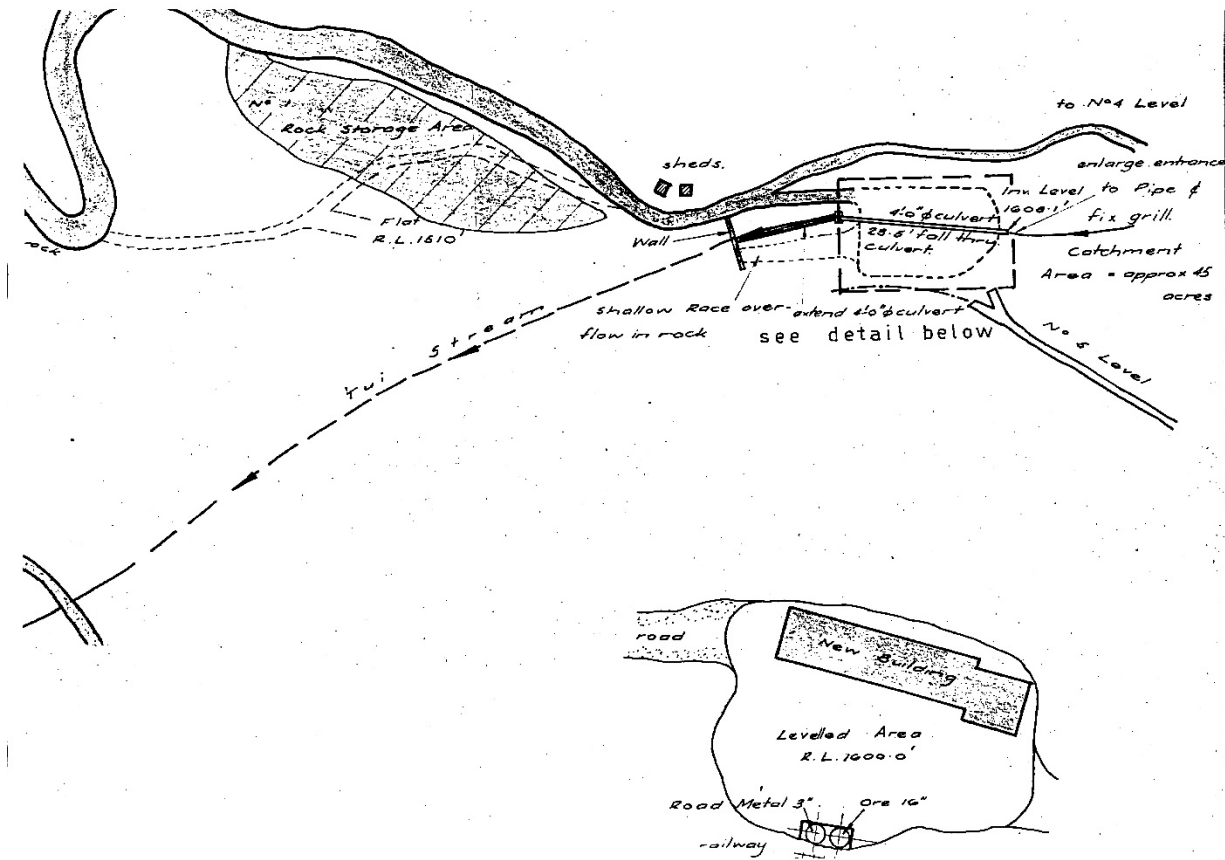
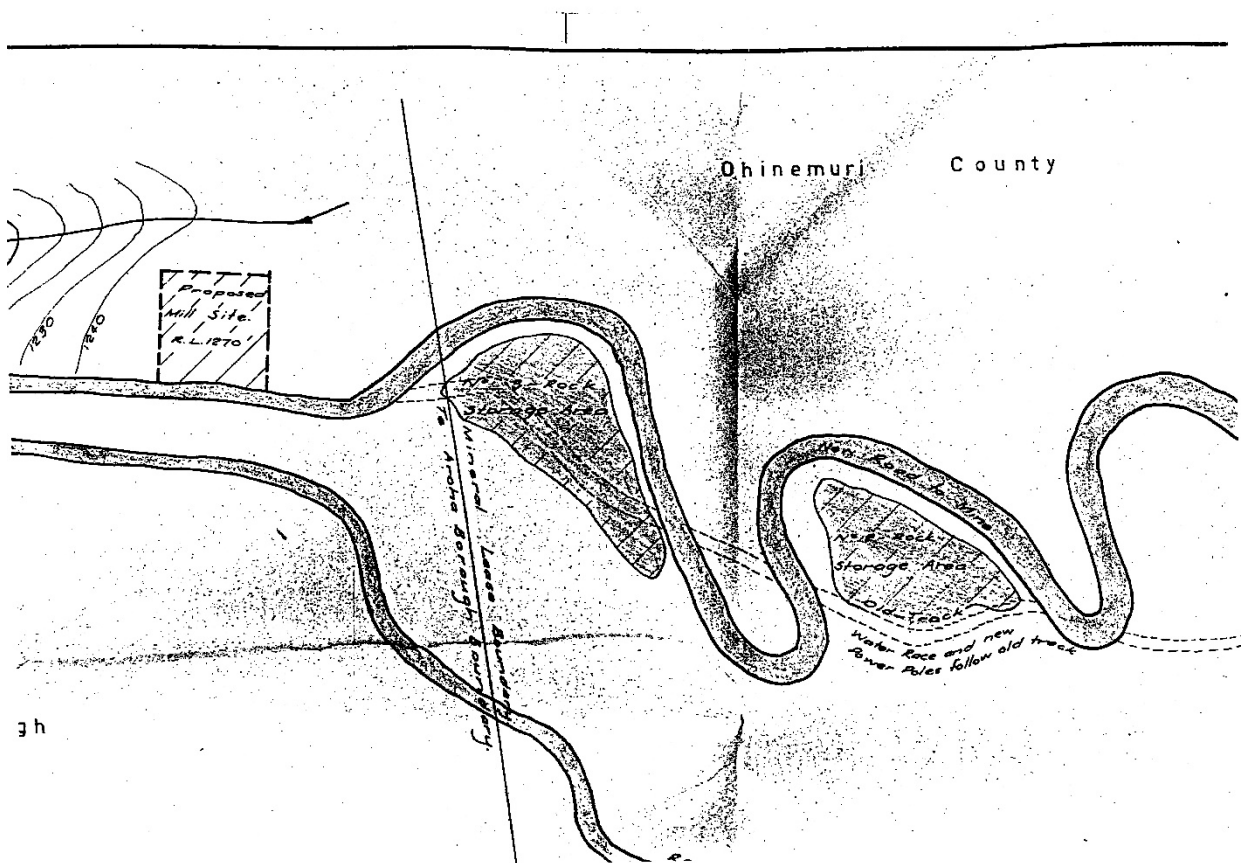
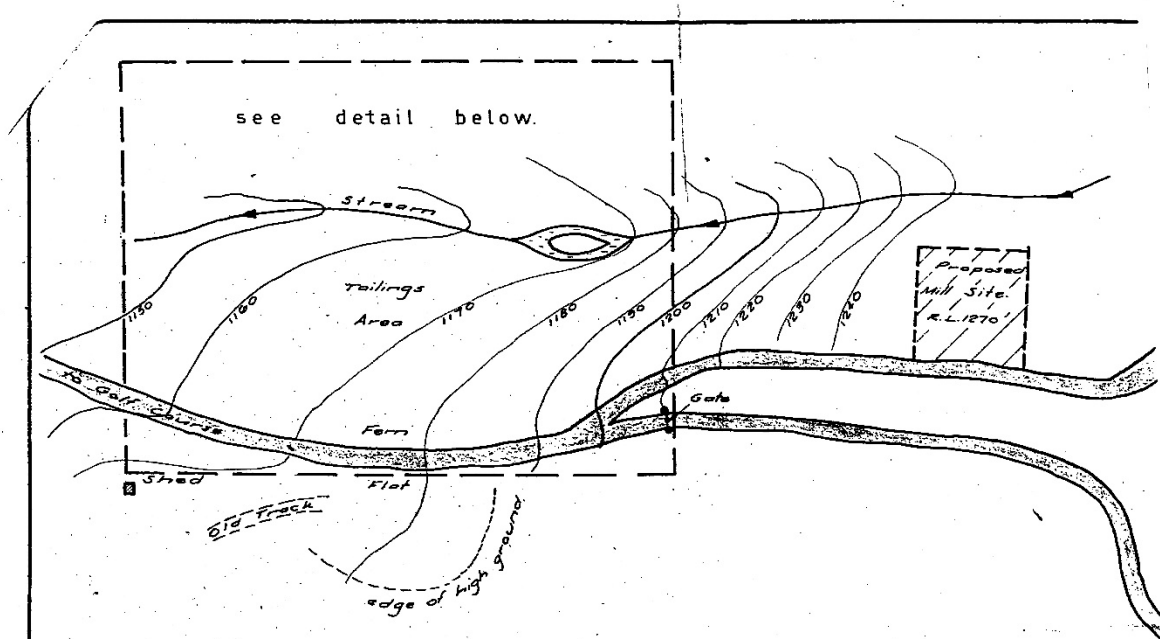


Figure 2: Norpac, plan attached to applications for Special Site, 1 September 1966, showing drainage, buildings, rock storage area, mill site, and tailings area, Te Aroha Warden's Court, Mining Applications 1966, 13/1966, BCDG 11289/6a, ANZ-A [Archives New Zealand/Te Rua Mahara o te Kawanatanga, Auckland Regional Office]; used with permission [in three sections because of size of the original].





Te Aroha Borough

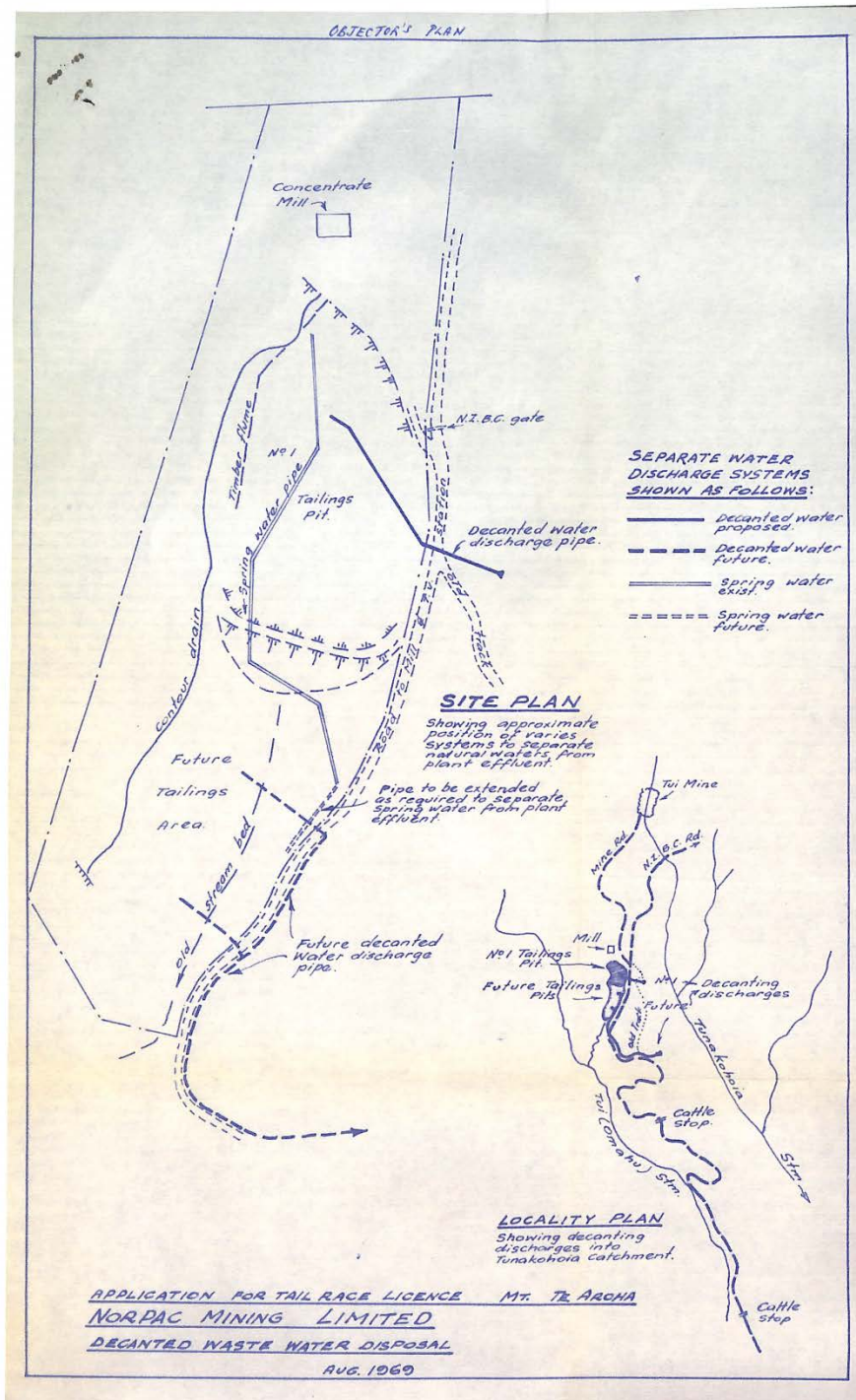


Figure 3: 'Objector's Plan', August 1969, attached to 'Application for Tail Race License, Mt Te Aroha, Norpac Mining Limited, Decanted Waste Water Disposal', 30 June 1969, Te Aroha Warden's Court, Mining Applications 1969, 5/1969, BCDG 11289/6a, ANZ-A [Archives New Zealand/Te Rua Mahara o te Kawanatanga, Auckland Regional Office]; used with permission.