



TE MATO VAI PROJECT GRIEVANCE

TE VAI ORA MAORI — 23 MAR 2021

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TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	4
INTRODUCTION — THE TE MATO VAI PROJECT.....	5
Grievance.....	5
Governance.....	5
Minimal technical detail.....	5
Te Vai Ora Maori.....	5
Key entities.....	6
LEGISLATION, POLICIES, STANDARDS AND SAFEGUARDS.....	7
METHOD OF OPERATION: STREAM DISCHARGE.....	8
PUBLIC HEALTH ACT 2004.....	9
Not standard practice.....	9
Cook Islands National Water Policy 2016.....	11
ENVIRONMENT ACT 2003 — THE STAGE 2 PERMIT.....	12
Takuvaie (Water Catchment Management Plan Regulations) 2006.....	13
NO PERMIT: THE PACL TRIAL.....	14
Waste production.....	14
The To Tatou Vai EIA.....	14
CIRCUMVENTING REGULATIONS: SODIUM THIOSULPHATE.....	16
Disinfection method.....	16
Selective referencing.....	17
Informal approval.....	18
The ecotoxicity of sodium-t de-chlorination by-products.....	20
Sodium-t conclusion.....	21
THE LANDOWNER COURT PROCEEDING.....	22
Landowner consent.....	22
Avoiding public engagement.....	23
GENUINE CONSULTATION.....	25
Discretionary consultation.....	26
Omitting information: Overflows.....	26
Withholding information: Ecology report.....	27
A predetermined outcome.....	28

GHD NEW ZEALAND.....	30
Perception management.....	30
No stream discharge.....	30
Disinfection alternatives.....	31
Soil health.....	31
Agricultural re-use.....	32
Diversionsary reframing: The non-science of waste management.....	33
Summarising stream health.....	35
Potential conflict of interest.....	37
NEXT STEPS.....	38
CONTACT DETAILS.....	38
REFERENCES.....	39
Media releases, website blogs, Facebook posts.....	42
APPENDIX A: PERMITTING PROCESS.....	43
The development activity permitting process.....	43
APPENDIX B: ENVIRONMENTAL INCIDENTS.....	45
Turangi.....	45
Takuvaie.....	46
APPENDIX C: RESOLUTION PROCESS.....	48
Government agencies.....	48
GHD Australia Integrity Officer.....	49
New Zealand Government: Development partner.....	50
Seeking dialogue.....	51
Objections have been clearly articulated, using the appropriate mechanisms, and in a timely manner.....	51
APPENDIX D: TWO PUBLIC PETITIONS — NO DIALOGUE.....	52
Te Mato Vai Petition (2014).....	52
Anti-chemical Treatment of the Water Supply of Rarotonga (2020).....	54

Cover: Kata, Cook Islands News, 8 Dec 2020.

EXECUTIVE SUMMARY

This grievance concerns the Te Mato Vai Project to upgrade Rarotonga’s public water supply treatment system and distribution network (2014—).

- **The proposed method of operation is unlawful.** Under the *Public Health Act 2004*, water treatment residuals are *hazardous waste*, and discharge to waterways is prohibited.
- **Regulations have been circumvented.** Development activity permits have not been obtained for commissioning processes, the PACI-trial, or ongoing operation. Protections afforded to the public by the *Environment Act* have not been enforced.
- **Selective interpretation of the EIA process has been used to justify unlawful operation.** Impact assessment requires risks to be identified in order to formalise mitigation strategies *before* development activity can proceed. Instead officials have argued for operation as a method of determining impact.
- **Landowner participation has been used as a proxy for public consensus.** The informal construct of ‘*landowner consent*’ has been used in place of the formal development permit(s). Intake landowner access negotiations have been used to avoid public consultation. Officials have endeavoured to transfer public service obligations to the judiciary.
- **Public participation in the project development process has been frustrated.** Consultation processes have not been genuine. Infrastructure has been constructed without sufficient consideration for the cultural and environmental impacts of operation, and presuming public consent for the method. Formal mechanisms for initiating dialogue including a public petition and an investigation by the Ombudsman have been subject to political interference.
- **Objections have been clearly articulated, using the appropriate mechanisms, and in a timely manner.** As information has been disclosed, Te Vai Ora Maori has endeavoured to initiate dialogue with officials. These efforts have been refuted, brushed-off, or our concerns discredited.
- **Project manager GHD has used selective referencing** to influence the outcome of regulatory application processes; and to mislead public perception of the impacts of operation.
- **Compromised governance has led to a lack of transparency and accountability.** In pursuit of an improved water supply system, steering group members have paid insufficient regard to development policy. Checks-and-balances have been by-passed to expedite infrastructure construction.

INTRODUCTION — THE TE MATO VAI PROJECT

Grievance

This grievance concerns the Te Mato Vai Project to upgrade Rarotonga’s public water supply treatment system and distribution network (2014—).

- Legislation has been ignored and regulatory processes have been circumvented. As a result the Te Mato Vai Project is insufficiently localised.
- The public have been prevented from meaningfully participating in the project development process.
- A non-standard method of operation requiring the discharge of waste to natural waterways, is culturally inappropriate, risks public health, and is environmentally irresponsible.

Governance

A multi-agency steering group provides direction for Government policy and funding of the project. The lead agency is the Ministry of Finance and Economic Management (MFEM). The other steering group members to answer this grievance are Te Marae Ora — Ministry of Health (*Public Health Act 2004*); the National Environment Service (NES) (*Environment Act 2003*), and New Zealand Ministry of Foreign Affairs and Trade (MFAT).

Responsibility for managing the project lies with the Project Management Unit (PMU); managed by New Zealand consulting firm GHD New Zealand Ltd.

Minimal technical detail

This grievance is not a comprehensive inquiry into the Te Mato Vai Project. It is not an assessment of the method of operation, nor is it a substitute for an Environment Impact Assessment. Technical detail has been provided only in brief, and chiefly references the formal reports provided by the project managers. The technical detail provided is to demonstrate the risks arising from the circumvention of regulatory process.

Te Vai Ora Maori

Te Vai Ora Maori (TVOM) is a community group formed in response to the management of infrastructure projects in Rarotonga, Cook Islands.

Efforts made to seek resolution of concerns regarding the Te Mato Vai Project have been frustrated, and often disregarded as being politically motivated, ‘anti-government’ or ‘anti-development’. When levelled at the specification of the system, officials have labelled valid criticism as ‘uninformed’ or ‘extreme’.

TVOM does not challenge the overall goal of the Te Mato Vai Project to improve Rarotonga’s public water supply system. However the risks associated with the current (insufficiently localised) system cannot be overstated.

We seek consideration of this grievance on its merits; in an objective and unbiased manner — and free from political interference.

Key entities

- **Te Mato Vai Project (TMV):** An infrastructure project to upgrade Rarotonga’s water supply treatment systems and distribution network.
- **GHD:** The New Zealand consultancy firm that manages the Te Mato Vai Project as the Project Management Unit; including the direction of construction activities (as the Principal); and communications and stakeholder engagement.
- **Project Management Unit (PMU):** PMU and GHD are used interchangeably in this document.
- **Cook Islands Government (CIG):** elected government and its administration.
- **McConnell Dowell:** The Contractor responsible for the construction of Stage 2 of the TMV project: water intake and treatment infrastructure.
- **Ministry of Finance and Economic Management (MFEM):** oversees the Te Mato Vai Project to provide direction for Government policy and funding. MFEM manages the contract for the Project. Responsible for ensuring the project meets the requirements of the *Environmental Social Safeguards Framework Policy*.
- **National Environment Service (NES):** Government department responsible for environmental regulations and assessment; and monitoring projects that require permits under those regulations.
- **Rarotonga Environment Authority (REA):** Permitting authority for development activity in Rarotonga.
- **To Tatou Vai Ltd (TTV):** The new water authority. A Crown Entity formed to operate and maintain the Te Mato Vai assets. Proposed to become a state owned enterprise under the *To Tatou Vai Authority Bill 2020*.

LEGISLATION, POLICIES, STANDARDS AND SAFEGUARDS

In 2015, the Project Management Unit (PMU) applied for a construction permit for Stage 2 of the Te Mato Vai Project. The Environment Impact Assessment (EIA) Report identifies the Cook Islands legislation, policies, and standards. Those relevant to this grievance are:

- *Environment Act 2003;*
- *Public Health Act 2004;* and
- *Environment (Takuvaive Water Catchment Management Plan Regulations) 2006.*

The *Cook Islands National Water Policy 2016* makes specific reference to minimising the impact of infrastructure development on water resources.

“...infrastructure, services and operations will be provided in a manner that ensures that ecological flows are maintained in natural streams and waterways to the greatest extent practicable.”

As a government-led development the project is evaluated according to the MFEM *Environmental Social Safeguards Framework*.

*“The nine Environmental Social Safeguard Standards (ESSS) establish **the standards that a project will meet through the project lifecycle...**”*

ESSS thematic areas relevant to this grievance include: *stakeholder engagement and information disclosure, social and environmental risk assessment, cumulative impact, baseline data, mitigation measures, biodiversity conservation, analysis of alternatives, monitoring, pollution prevention and management, management of hazardous wastes.*

METHOD OF OPERATION: STREAM DISCHARGE

Te Mato Vai system has been designed to discharge wastewater to natural waterways. Using the Ngatoe treatment facility as an example; there are five formal operational discharge points:

- **settling tank overflow;**
- **mid-level drain:** used when clearing/cleaning the settling tank;
- decanting from the **scour/sludge pond;** and
- decanting from the two **sand filter backwash ponds.**

Unmanaged/informal stream discharge points include:

- **discharge from the stainless steel storage tanks** (observed in Turangi July 2019);
- **sludge removal:** mechanised clearing of surface water; or dewatering of sludge prior to transport.
- **overflow and wash-out of sludge and backwash storage ponds:** overflow occurred in 2020 due to upstream culvert failure at Takuvaive (June 2020); and during high-rainfall storm events (Aug 2020).

With minor variation in layout the same treatment system has been constructed at all ten treatment facilities.



Ngatoe waterworks showing formal wastewater discharge points

Treatment flow is right-to-left.

PUBLIC HEALTH ACT 2004

Te Mato Vai waterworks are located on the majority of Rarotonga's major freshwater streams. The intake streams flow-on through residential and recreational areas. Rarotonga's streams are a food-basket. Water and plants are collected for traditional medicine and craft purposes. The streams are places for families to explore, swim, fish, and play.

Under the *Public Health Act* 'hazardous waste' includes ***“sludge, other by products, or other waste from... water treatment plants”*** (s.3(1)).

The Act: *prohibits “any hazardous waste to be directly or indirectly deposited or discharged, or to seep, into a waterway”* (s.54(d)).

Any person who **causes** or **permits** discharge into a waterway is in breach of the *Public Health Act* (s.54(1)).

1. Operation of the Te Mato Vai treatment system includes the direct discharge of wastewater to natural waterways.
2. The content of the discharge includes chemically-treated wastewater, dissolved and suspended organic material (settled out of the raw streamwater or from the surfaces of the unlined storage ponds). Sediment is also lifted into suspension at the stream discharge point (*mixing zone*). Wash-out in storm events has the potential to re-suspend and transport sludge from storage ponds directly to the stream.
3. The public has not been notified of commissioning or operational stream discharge. They are unaware of the risks resulting from operational discharge: changes in water chemistry; sediment levels; and unexpected increase in water flows.

Not standard practice

4. In a memorandum to landowners, the PMU advised that the method of operation is not standard practice. As such there is no research on the long term impacts.

“5 Monitoring and Management Practices (Environment)

*In New Zealand and Australia, in most cases sludge supernatant is recycled back to the inlet of the water treatment plant¹. This is achieved by pumping the supernatant back up to the head of the works prior to the dosing point. In this way, it is only the sludge that becomes waste product as the supernatant is recycled back into the “process” water and is ultimately consumed. So, **for discharges of PACI (or dissolved aluminium) to the environment (through Supernatant), there is no ‘standard practice’ ...”***

- Project Management Unit [PMU], 2019, p.4

¹GHD identified one water treatment facility in New Zealand and Australia where PACI discharge has been permitted. The council issuing the resource consent, also permits septic waste to be discharged to the same stream.

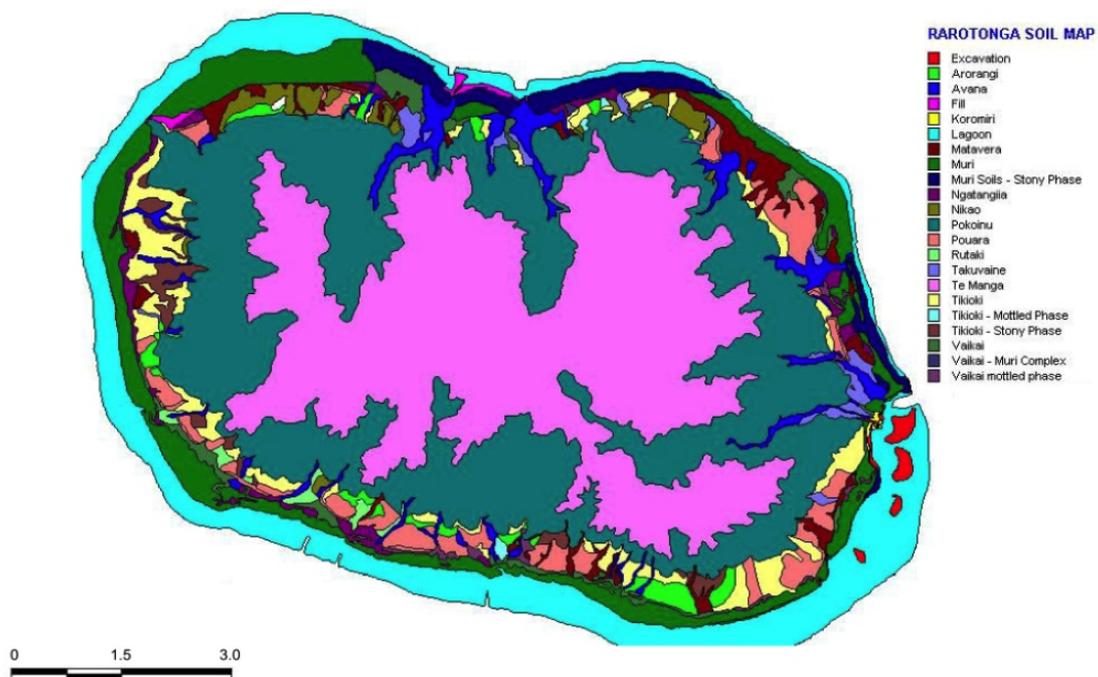
5. The configuration of the onsite sludge and wastewater storage ponds is also not standard practice – there is only a single sludge storage pond at each site; ponds are located in close proximity to freshwater streams; and downslope of surface water flows. With annual inland rainfall recorded at 4 meters, there is little chance for the ponds to dry-out.

“Normal practice for ponds intended to be dried by natural drying is to have two ponds, allowing one to be removed from service and dried over an extended period.”

- Watson, 2020, p.28

Cook Islands National Water Policy 2016

6. **The Precautionary Principle** as defined in the *Cook Islands National Water Policy 2016*: *Taking active measures to prevent serious or irreversible environmental damage or degradation whether the consequences are uncertain or not.* (p.4)
7. The Policy also advocates for: **Sustainability & Environmental preservation**: *Strive to protect and avoid adverse interference with the natural ecology of the Cook Islands’ waters and lagoons and ensure that usage and management of water will be conducted in a manner that will preserve and enhance this resource for generations to come.* (p.4)
8. A method of operation that periodically disrupt natural flows disregards these principles. Along with **changes to streamwater chemistry**, the force of discharge can cause **stream bank erosion** and **elevated sediment levels**; with downstream impacts on biodiversity and public health.
9. **Streamwater sustains coastal wetlands** critical to lagoon and reef health.
10. Research on the continuous dosing of alum has shown **bioaccumulation** of aluminium in *kōura* and common bully (small fish). (Ling, 2015)
11. **Aluminium (phyto)toxicity** is a condition that negatively impacts plant root growth. This condition affects key agricultural areas in Rarotonga (*Pouara* and *Rutaki* soil types). (Leslie, 2009). Toxicity may be exacerbated if crops are irrigated using chemically-contaminated streamwater (or by residual chemicals in the public supply).



Rarotonga soil types map

Pouara (salmon pink) and *Rutaki* (fluorescent green) soil types are noted as prone to aluminium toxicity. (Thomas, F. / ADB., 2009)

ENVIRONMENT ACT 2003 — THE STAGE 2 PERMIT

Te Mato Vai Stage 2 Permit authorised the construction activities detailed in the Stage 2 Environment Impact Assessment Report (GHD, 2015). The Permit does not authorise chemical treatment; the discharge of wastes to waterways; or a method of operation generating a hazardous by-product².

Development activities with potential for significant environmental impact must complete an Environment Impact Assessment process (EIA).

See Appendix A for an overview of the development permitting process.

12. The sites of the ten Te Mato Vai water treatment facilities are in areas of *specific concern*; on sloping land and in close proximity to natural waterways.
13. The Stage 2 Permit was authorised in April 2015 in principle (but in advance of the EIA Report), subject to a number of conditions.
[Conditions] 5. That the Project Manager strictly follows the guidelines/plans/specifications that have been submitted to the National Environment Service as part of the Te Mato Vai Project EIA [Report].
- Wilmott Karika, I., Rarotonga Environment Authority, 27 April 2015, [Permit]
14. The Stage 2 EIA Report did not include: detail of the commissioning method³; the use of a specific coagulation chemical; that operation of the system would involve the discharge of wastewater to waterways; or that treatment would generate hazardous waste.
15. A review by a court-appointed expert confirms that the Stage 2 EIA Report did not detail the operational use of chemicals:
...the assessment ignores the potential impacts of using flocculant chemicals on the environment. The Mott MacDonald Detailed Design Report does not cover any environmental impacts.
- Watson, 2020
16. Terms of Reference for the Stage 2 EIA (National Environment Service, 2014) called for consideration of *alternatives to the proposal*.
2.2 Alternatives to the Proposal
This section should describe feasible alternatives For example if the Rarotonga Community are not in favour of the proposed work sitings and design, will there be any alternatives to that if the community asked for such alternative? Such alternatives, if any, should be discussed in sufficient details to enable full understanding of such options.

The Stage 2 EIA Report does include consideration of alternatives to the proposed treatment method.

² Sludge and by-products from water treatment are defined as hazardous under the *Public Health Act 2004*.

³ Reference is made to Infrastructure Cook Islands engineering standards: *Technical Standards for Water Supply in Partnership with the Institution of Professional Engineers*. These standards do not permit wastewater to be discharged to waterways, but direct operators to dispose of wastewater to a *suitable outlet*.

17. An Environment Impact Assessment details the potential socio-cultural and ecological/biodiversity impacts and relies on the process of public consultation. There has been no public consultation on the proposed method of operation.

Takuvaine (Water Catchment Management Plan Regulations) 2006

18. The *Takuvaine (Water Catchment Management Plan Regulations) 2006* (under the *Environment Act*⁴) reserves the right for the Management Committee to approve the use of chemicals in the Takuvaine water catchment area:
No person shall take any chemical into the Area or use any chemical in the Area unless its use has been approved by the Management Committee (s.13).
19. The Takuvaine Regulations also refer to the *Takuvaine Watershed Management Plan*:
Any chemical that is proposed to be used in the raui area to be considered in (2) will not be considered unless a project permit is obtained from the Environment Service as required under section 37 of the Environment Act.

The Takuvaine Management Committee holds authority, but will not consider any application for chemical use until a development project permit has been obtained.

⁴ An observations from a member of the founding Takuvaine Intake Catchment Committee is that the community management model was a pilot, intended to be 'rolled-out' to the other catchment valleys.

NO PERMIT: THE PACL TRIAL

In September 2020, the PMU directed the contractor to commence the operational use of the coagulant chemical polyaluminum chloride (PACl). Industry practice and Cook Islands regulations under the *Environment Act* require the assessment of a proposed method of operation to be undertaken *prior* to operation.

20. PACl treated water was held in storage tanks for the first few days of the six-month trial period. This was referred to as an *offline trial*. Permission was then obtained from To Tatou Vai to release water into the public network. From that point the system was operational, becoming an *online trial*.
21. The trial operation of the system includes the same risks and potential impacts as long-term operation. Treated water is fed into the public water supply network; wastewater and sludge is piped to the onsite storage ponds; and cleaning the settling tank involves discharging chemically-treated water to the stream.
22. Rather than a live trial, desktop jar testing is the industry-endorsed assessment method.
“The best approach for determining the treatability of a water source and determining the optimum parameters (most effective coagulant, required dose rates, pH, flocculation times, most effective flocculant aids) is by use of a jar tester.”
 - Ministry of Health New Zealand (2017) 13.4.2 Jar testing, p.11

Waste production

23. The production of waste began when chemical dosing commenced.
24. Watson’s assessment (2020) included an estimate of PACl sludge volumes⁵. This calculation pointed to the need for the clearing of settling tanks and wastewater storage ponds within the six-month trial period.
25. Despite this assessment, the PACl trial commenced without provision for waste management.

The To Tatou Vai EIA

An EIA for the operational use of PACl is currently underway, and will be submitted by New Zealand consulting firm Tonkin+Taylor (T+T) on behalf of the new water authority – To Tatou Vai.

26. The Terms of Reference (ToR) for this EIA was drafted by GHD in Oct 2019. (Yang & Trebitsch).
27. The Cook Islands Government has used the EIA process to justify proceeding with trial-operation.
“The [TTV] EIA cannot be finalised until we obtain during this initial [trial] phase likely quantum of sludge and likely viscosity of that sludge.”
 - Mason, B., email, 13 Oct 2020

⁵The estimate was just over 4,000 cubic meters per year. This volume averages a 20 foot container of waste per intake each month.

28. The Terms of Reference does not call for a live trial; or that the EIA report should include the results of such a trial.
29. In a meeting with landowners and Te Vai Ora Maori (Jan 2020), consultants from T+T advised that the expected process is to complete the EIA **before** proceeding with development activity.
Landowner counsel: How will you do the EIA without proper tests?... [H]ow can you do the EIA without the trial run?
*T+T: [We] will make assumptions to do the EIA process. This is inherent in the EIA process – **consider likely/potential impacts before an activity takes place**.*
- Tonkin+Taylor, 18 Jan 2020 [meeting minutes]
30. Sc36 (13) of the *Environment Act*; provides guidance regarding the interpretation of 'significant impact' in relation to permitting requirements (*approval*):
*(13) any designation, or issue or re-issue of approval... for **the disposal of any kind of waste is deemed to be an activity that is likely to cause significant environmental impacts**.*
31. To maintain drinking-water quality, sludge (waste) must be cleared from the settling tank to the onsite storage ponds. Clearing the settling tank requires supernatant to be discharged to the stream. The expert assessment determined the settling tank would be cleared every 33 days (I.e. within the six month trial period). Such considerations would have been raised by an EIA.

CIRCUMVENTING REGULATIONS: SODIUM THIOSULPHATE

In advising the CIG, it appears that GHD/PMU failed to exercise due diligence; or minimise the risks associated with the proposed de-chlorination method.

- **Calcium hypochlorite** (chlorine) is used to sterilize water treatment tanks and pipework prior to use.
- **Sodium thiosulphate** (sodium-t) is used to neutralise chlorine.

Disinfection method

32. The commissioning sterilisation method includes disinfecting tanks and pipework with super-chlorinated water, from a dose of 20ppm⁶.

5.11.1 [Disinfection] General

The Contractor shall introduce at least 20ppm of chlorine or such greater quantity of chlorine as will produce a residual of at least 1ppm of free chlorine at any point along the pipeline being sterilised 2 hours after the section of pipeline has been filled with water. If after 24 hours, the residual chlorine is 1ppm or greater, then disinfection shall be deemed to be complete and the chlorinated water shall be drained and flushed away to a suitable outlet where no harm will result from the flow or its contents.

- Infrastructure Cook Islands, *Technical Standards for Water Supply in Partnership with the Institution of Professional Engineers Cook Islands*. May 2014

33. After concerns were raised by landowners, chlorinated wastewater was held in the stainless steel storage. However, after ten months, the chlorine levels in the stored water did not meet the ANZECC standard.
34. August 2020, GHD then proposed the use of sodium thiosulphate (sodium-t) to (chemically) de-chlorinate the wastewater.

⁶Chlorine is toxic to freshwater species from 0.04ppm: four parts chlorine to 100 million parts water. ANZECC Environmental guidelines have set a freshwater moderate reliability trigger value of (less than) 0.003ppm.

Selective referencing

GHD combined references from two separate (and conflicting) industry guidelines to supporting the request to use sodium-t.

Dechlorination Chemical	Dechlorinates:		Water Chemistry Effect:			OH&S Needs	Reaction Time
	Free Chlorine	Combined Chlorine	Dissolved Oxygen	pH	Toxic at dosage		
Ascorbic acid (vitamin C)	✓	✓	No	Yes (minor)	No	No	Fast
Sodium ascorbate	✓	✓	No	No	No	No	Fast
Hydrogen peroxide (5%)	✓	✗	No	No	Yes	Yes	Fast
Sulphur dioxide	✓	✓ ¹	Yes	Yes	Possible	Yes	Fast
Sodium sulphite	✓	✓ ¹	Yes (med)	No	Yes	Yes	Fast
Sodium bisulphite	✓	✓ ¹	Yes (strong)	Yes	Yes	Yes	Fast
Sodium metabisulphite	✓	✓ ¹	Yes (strong)	Yes	Yes	Yes	Fast
Sodium thiosulphate	✓	✓ ¹	Yes (med)	No	Possible	Minor	Slow
Calcium thiosulphate	✓	✓ ¹	Yes (med)	No	No	Minor	Slow

¹ There is a dechlorination resistant fraction of chloramines to sulphur-based compounds

Table 6 (in source): Summary of common dechlorination methods

Sodium thiosulphate is not recommended: it reduces dissolved oxygen levels; may be toxic at dosage; and (as a sulphur-based compound) results in dechlorination resistant chloramines.

- 35. Industry guidelines differentiate between environmental discharge ‘to ground’ (typically bare soil⁷); and environmental discharge to a natural waterway.
- 36. GHD reference a Watercare New Zealand code of practice for the discharge of de-chlorinated water. The term ‘receiving environment’ broadly means end-location; and not *natural* environment.
- 37. The Watercare guideline applies *only* when discharge will be to a *street channel or stormwater system*.
At the end of the contact time, the chlorine in the water in the new main must be neutralised before the water is discharged to the receiving environment (the street channel or stormwater system⁸).
- Watercare New Zealand; referenced by GHD, S. Cairney, per comms., 21 Aug 2020
- 38. **The discharge of super-chlorinated/de-chlorinated water to catchment areas and waterways is prohibited in New Zealand.** In the same Watercare Code of Practice, operators are required to:
[Confirm] that the discharge will not enter any water supply catchment, Wetland, Natural Water or Natural Stream Management Area.
- Watercare New Zealand (2017) p.18

⁷The toxicity of chemicals is typically reduced on contact with organic matter.

⁸ In an urban setting, stormwater may subject to treatment before discharge from the network. The management of such systems requires resource consent when the receiving environment is a natural waterway.

39. The PMU advised MFEM that sodium-t is: *“a safe and reliable way of dechlorinating disinfection water prior to discharge to the environment”*; and reference a further Australian industry guideline: *Dechlorination of Drinking Water Discharged to Waterways* (2019).
40. The Australian guideline **does not** recommend sodium-t:
Any use of these chemicals [including sodium-t]... would require careful justification and is not recommended as the best practice for dechlorinating drinking water.
- Water Services Association of Australia (2019) p.19
41. The de-chlorination chemical recommended in the Australian industry guideline is vitamin C (ascorbic acid). (pp.18-20)

Informal approval

GHD sought *informal* approval to proceed with a development activity regulated under the *Environment Act*; and prohibited by the *Public Health Act*.

42. Aug 2020, GHD approached MFEM with the request to use sodium-t:
“...to reduce the complication around justifying another chemical in the court process.”
- Cairney, S., letter GHD to MFEM, 21 Aug 2020
43. It is inappropriate for GHD to seek approval for the use of sodium-t through Ministry of Finance and Economic Management (MFEM).
44. The National Environment Service (NES) manage the permit application process. The Rarotonga Environment Authority (REA) approves permits.
45. GHD is aware of the correct process: the PMU was the *proponent* in earlier Te Mato Vai permit applications. The Stage 2 Permit was issued to Project Manager Evan Mayson in 2015; and again on extension in 2019.
46. After receiving GHD’s letter, MFEM then sent a letter to NES advising the regulatory body that an EIA was not required.
“Based on the implementation of the management and monitoring approach proposed, it is our view that no significant impact is likely to result from this activity and therefore an EIA is not required for the use of Sodium Thiosulphate (under Sc36 of the Environmental Act 2003).”
- Williams, A., letter MFEM to NES, 26 Aug 2020
47. MFEM’s appraisal does not take into account Sc36 (13) of the Act, which provides guidance regarding the interpretation of ‘*significant impact*’:
*(13) any designation, or issue or re-issue of approval... for **the disposal of any kind of waste is deemed to be an activity that is likely to cause significant environmental impacts.***
-Environment Act 2003
48. The *Public Health Act 2004* prohibits the discharge of hazardous waste to waterways.

49. On receiving the notification letter from MFEM, NES conducted an internal assessment. REA members were advised that this assessment was based on a training workshop (run by GHD) and the information contained in the notification from MFEM (provided by GHD).
"... our own assessment based on the training and information provided we have come to the conclusion that the introduction of Sodium Thiosulphate will not impact the environment, provided that it is strictly managed and controlled."
 - Tangatataia, V., email NES to REA, 18 Sep 2020
50. The NES Compliance Manager emailed the members of the Rarotonga Environment Authority (REA) advising that MFEM's application to use sodium-t did not require formal approval, but at the same time seeking support from REA members.
*"NES is therefore of the view that **the use of Sodium Thiosulphate does not require a separate project permit or a consent letter**...the Director will be drafting a letter stating that the use of Sodium Thiosulphate can proceed.
Please respond to this email either confirming whether you support NES's assessment and intended response to MFEM's notification, or if you have any comments/queries about the use of Sodium Thiosulphate."*
 - ibid.
51. In Aug and Sept 2020, landowners were invited to meetings to discuss the *To Tatou Vai Authority Bill* (TTVA Bill). At these meetings, they were notified that operators were to use sodium-t as part of the Te Mato Vai Project.
52. At one meeting, a landowner provided the panel with an aquaculture reference on potential ecotoxicity of sodium-t by-products. (Wigmore, R., pers. comm., 24 Aug 2020)
53. There were no public consultations on the operational use of sodium-t.
54. TVOM wrote to the PMU directly.
"As sodium thiosulphate is 'not recommended as the best practise'; and given the concerns expressed by landowners regarding the management of chemical treatment methods, it is surprising to find GHD are endorsing sodium thiosulphate. The WSAA guideline suggests that GHD should instead investigate the practicalities of using vitamin C. [ascorbic acid]"
 - Kirkwood, A., email TVOM to PMU, 25 Sep 2020
55. Additional objections were raised directly with the REA by counsel acting for the landowners ; and Te Vai Ora Maori.
 (Nicholas, T. (counsel for landowners), email., 27 Sept 2020; Flanagan, J. (TVOM), email., 19 Sept 2020)
56. NES also provided information on sodium-t to the REA members at a subsequent meeting, but did not seek authorisation:
"It was an information meeting, there were no requests for endorsements."
 - Mackenzie, T., email., 29 Sep 2020

The ecotoxicity of sodium-t de-chlorination by-products

57. The by-products of sodium-t de-chlorination are *chloramines* (not be confused with chlorine); and either ammonia or ammonium depending on water pH.
58. In Canada, the accidental discharge of chloramine-disinfected drinking water resulted in convictions under the *Fisheries Act* due to salmon die-off. Investigation of two separate incidents in British Columbia concluded that **streams with low flows and high water quality** (low levels of nitrogen and carbon) **were most at risk of impact from chloramine discharge** (Health Canada, 2001).
59. Rarotonga's streams are subject to extreme variation in flow; some dry-out during periods of low rainfall.
60. Observations made by Te Mato Vai engineers suggest that Rarotonga's streams have low levels of carbon.
*"[18] ...rates for PACl are generally 14-24mg/L, however, the proposed dosing rate for Te Mato Vai sites are significantly lower at approximately 4-6mg/L.
 19.The reason for the reduced dosing rate on Te Mato Vai relates to the clarity of the dry weather flows..."*
 - Sloan, D., Cairney, S., & Free, P. (GHD), memo., 31 Oct 2019. *Information Pack: Stage 2 Commissioning: Appendix 4*. PMU, 2019.
 - The Watercare analysis of Rarotonga's water quality (2014) did not measure dissolved carbon content, but in dry conditions nitrate-n levels were very low (min. 0.004mg/L – Avana).
 - The GHD *Aquatic Ecology Baseline Report* made the following observation⁹:
"Waterways on Rarotonga typically had a low proportion of organic matter (plant and animal material)..." (Pratt, L., 2020, p.41)
 - Monitoring by GHD of the de-chlorinated discharge was limited to measuring dissolved oxygen levels (Fischer, A., 27 Aug 2020); and did not include biodiversity monitoring.
61. Incidents of stream die-off coincide with the discharge of de-chlorinated water (Avana and Turangi, Sept-Oct 2020). A change in pH levels may have resulted in the formation of toxic chloramines.

⁹ In chemistry terms, *organic* substances contain carbon.

Sodium-t conclusion

62. GHD's recombination of separate and conflicting industry guidelines misrepresented the suitability of sodium-t as a chemical de-chlorination method.
63. GHD acted both as proponent and adviser: seeking approval to proceed with a chemical de-chlorination method through MFEM; and providing advice to the NES staff who advised REA members. Serving dual roles can be seen to have undermined the integrity, and impartiality, of the permitting process.
64. The use of sodium-t to dechlorinate the water includes the disposal of waste.
65. Development activity that includes the disposal of waste is deemed to risk significant impact; requires an EIA; and must obtain a development permit authorised by the Rarotonga Environment Authority.
66. Under the Environment Act, NES cannot directly authorise development activity that includes the disposal of waste.
67. The PMU (as principal) did not obtain the necessary permission, and had no authority to instruct the contractor to discharge waste to waterways.
68. Each incident of discharge without a permit is an offence under the *Environment Act*.
69. The discharge of chloramines to waterways may have caused the stream die-off incidents observed in Avana and Turangi, Sept-Oct 2020.

THE LANDOWNER COURT PROCEEDING

Intake landowners are stakeholders in the Te Mato Vai Project, holding title to the lands where the water infrastructure has been constructed.

The CIG has used the ongoing access agreement negotiations overseen by the High Court to circumvent regulatory process and frustrate public engagement.

70. In 2018 an objection was filed within the Cook Islands High Court by intake landowners; under the *Rarotonga Waterworks Ordinance 1960*. The landowner objection relates to the rights of (land) title and access.
71. The Ordinance is a form of access agreement: it authorises operators to access water infrastructure located on private property.
72. The Ordinance is not concerned with the process of obtaining a permit for development activities; nor determining a water treatment method.
73. The Ordinance does not allow the PMU or CIG to disregard the *Environment or Public Health* acts.
74. A Justice has been appointed to give negotiations legal status (to record communication between landowners and the Crown).
75. The Justice has not been charged with resolving the issue of water treatment method.
76. The proceeding is not a hearing. Counsel for the Applicants (landowners) has confirmed: *“the [landowner] proceedings are not pending an outcome or awaiting for a judicial decision.”*
- Nicholas, T. (counsel for intake landowners), letter, 6 July 2020

Landowner consent

77. Landowners have been provided with notifications of intent; technical documentation; and invited to witness commissioning activities.
The [PACI-trial] monitoring reports will be used to inform that Government and landowners’ views on longer term PACI use.
- CIG, 30 Nov 2019, media release in Cook Islands News.
78. Landowner participation has been used to infer landowner (and broader public) consent. It has been used to reassure project steering group members that consultation and regulatory processes have been completed.
79. As an example in Nov 2019, CIG claimed to have consent from ‘most landowners’ to proceed with the six month PACI trial. At that time, the stream survey and ecology report were yet to be commissioned. Those landowners who agreed to the trial, were asked to do so without due consideration of the environmental impacts.

After last minute talks with land-owners went right down to the wire yesterday, the Government has instructed contractor McConnell to begin turning on the taps. Most land-owners of the 10 water intakes have agreed to a six-month trial of poly-aluminum chloride...

- Cook Islands News, 30 Nov 2020

80. Landowners are not a permitting authority under the *Environment Act*.
81. Landowner engagement cannot be used in place of public participation in project development activities.
82. The landowner court proceeding does not allow the CIG to circumvent regulatory process.

Avoiding public engagement

83. Cook Islands regulations and policies establish the right of the public to participate in development projects.
84. Officials have presumed *landowner* access negotiations to have resolved *public* concerns. Public concerns have then been disregarded as '*a matter before the court*'. Examples as follows:

Responding to questions regarding the permitting of the PACI-trial:

[former TTV CEO Brent] Manning said the initial work was lawful. "This has been agreed with landowners through a consultative process, ..."

- Cook Islands News, 19 Feb 2020

Ombudsman's update on the investigation into the PACI-use permitting process:

I have been informed by the Financial Secretary Garth Henderson of the following;

1. That this matter has already gone to court and an independent expert engineer has been appointed by the court to review the process and that his report has been completed,

2. That the Crown and the Appellants [landowners] are working on a joint memorandum to the court on how the matter is to proceed further.

- Tearea. N., Ombudsman, letter, 29 April 2020

Addressing Parliament on the *Anti-chemical Treatment of the Water Supply of Rarotonga* public petition:

"I would like to remind the members that the petition issues that were highlighted are a matter that is currently before the court.... So I am quite happy Madam Speaker that due process with professionals to look at these concerns is being undertaken right now through the judicial process."

- Hon. Mark Brown, [Hansard] 19 June 2020

The Acting New Zealand High Commissioner responding to TVOM request for assistance from the Clerk of the House of Representatives on the interpretation of Standing Orders:

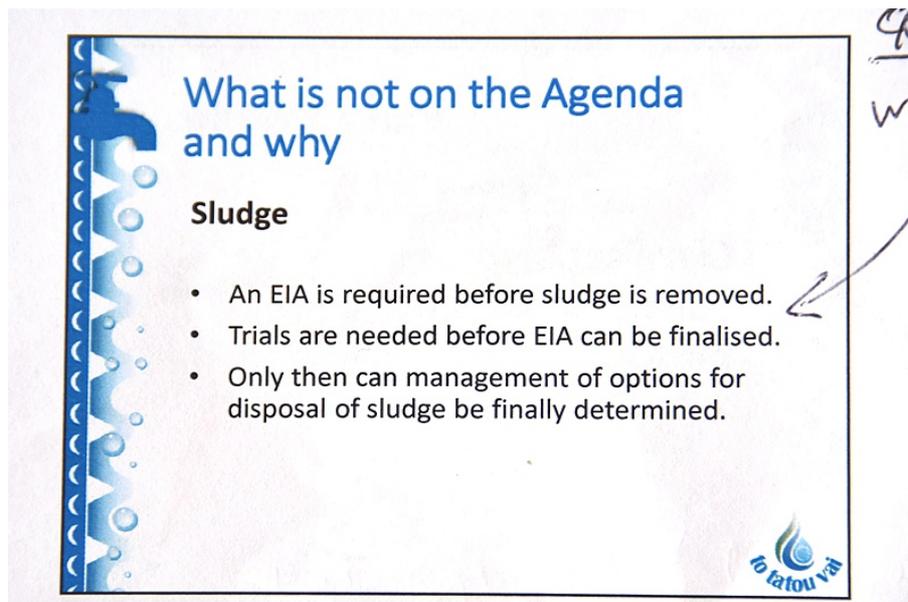
"As a member of the project's steering committee, we understand the concerns of Te Vai Ora Maori are currently being considered by the Cook Islands judiciary."

- Bennett, R., email, 25 Jun 2020

85. **The legal remedies available to landowners** through the Court system are bound to the rights of legal (land) title. Such rights **are not available to the public**.
“... rights afforded to the landowners in respect of these proceedings and the Rarotonga Waterworks Ordinance 1960 are not available to the petition organizers or the general public.”
- Nicholas, T. (counsel for intake landowners), letter, 6 July 2020
86. Through the court, an expert was charged with answering a set of questions posed by landowners concerning the potential impacts of the water treatment system (infrastructure and operation) on their land. While there may be an overlap in areas of interest, the expert was not engaged for the benefit of the public, or to prepare an Environment Impact Assessment.
87. **CIG’s obligations to the public have not been transferred to the judiciary.**

GENUINE CONSULTATION

88. The actions of the Cook Islands Government in specifying the Te Mato Vai system do not constitute *genuine consultation*. With reference to New Zealand case law:
- *The essence of consultation is the communication of a genuine invitation to give advice and a genuine consideration of that advice.*
 - *The effort made by those consulting should be genuine, not a formality; it should be a reality, not a charade.*
 - *Sufficient time should be allowed to enable the tendering of helpful advice and for that advice to be considered. The time need not be ample, but must be at least enough to enable the relevant purpose to be fulfilled.*
 - *It is implicit that the party consulted will be (or will be made) adequately informed to enable it to make an intelligent and useful response. The party obliged to consult, while quite entitled to have a working plan in mind, should listen, keep an open mind, and be willing to change and if necessary start the decision-making process afresh.*
 - *The parties may have quite different expectations about the extent of consultation.*
- Knight & Clark, 2020



Presentation slide: Landowner Consultation Meeting

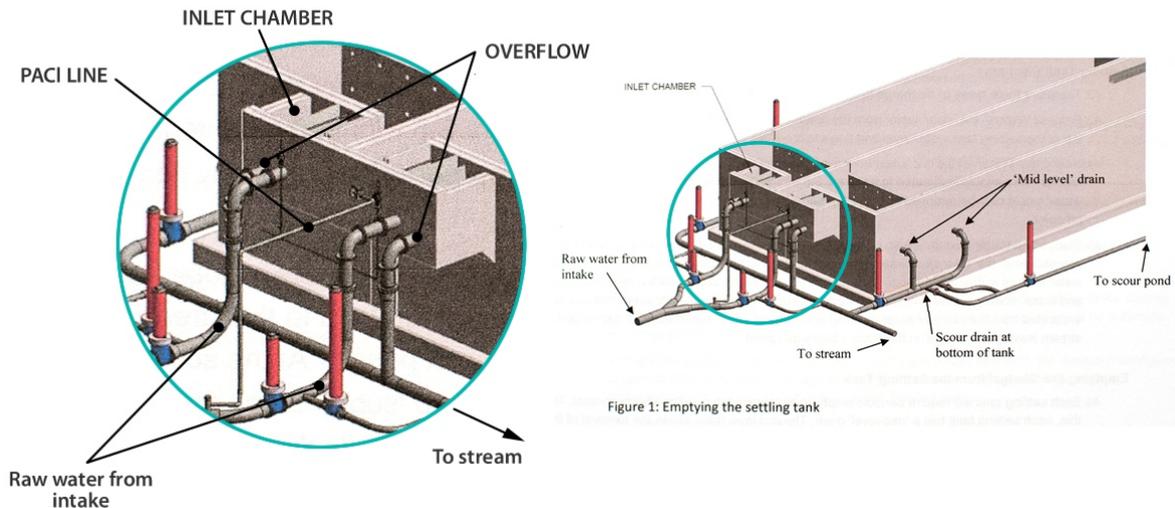
Monday 24th August 2020. (Catchment) landowner meetings were called following consultations on the To Tatou Vai Authority Bill. 'On the agenda' was notification of the intent to proceed with chemical de-chlorination (using sodium thiosulphate).

Discretionary consultation

89. The public have been broadly excluded from the Te Mato Vai Project development project consultation process.
90. Detail regarding the method of operation has been provided to landowners, but not released for public response.
91. Landowners have received affidavits from water technicians; standards and guidelines; and research reports. The most significant compilation being the 128-page *Information Pack: Stage 2 Commissioning* (PMU, Nov 2019). Taken largely from industry publications, this material is for an expert audience. As an example:
All parameters including colour and turbidity are marginal as to whether the water needs to be dosed with coagulant for colour during dry weather conditions. However, due to the speed of change of flows (and resulting sediment loading) it is likely that to achieve a consistent water output (without powered monitoring devices and control), coagulant will be required most (if not all) of the year. The decision to treat all the water all of the time (the sedimentation tank will not be needed for consistent periods of dry weather and the AVG would be kept operational) is to optimise water quality.
- Project Management Unit, 2019, *Information Pack: Stage 2 Commissioning*
92. Such material does not meet the ‘plain English’ requirements of an EIA report.
*The EIA [Report] is a public document. Its purpose is not only to provide information to regulatory agencies, but also to inform the public of the scope, impacts and mitigation measures of the proposal. As such the main text should be written in **plain English avoiding jargon as much as possible.***
- National Environment Service, 2014

Omitting information: Overflows

93. As part of the court proceedings Watson communicated directly with the PMU in preparing his report for landowners. Correspondence relevant to the assessment of risk was not provided: notable the risk of overflow from the settling tank.
*“3. Overflows from Settling Tank
This risk has been reported on separately – refer letter to Judge [sic] Keane dated 9 March.”*
- Watson, 2020
94. Omission of this detail is critical, as it relates to the standardised design of the Te Mato Vai infrastructure (it affects all waterworks); and has been implicated in the Takuvaine stream die-off event (Dec 2019). If not mitigated, the commissioning activities at the other nine treatment facilities might risk similar impacts on stream health.



Settling tank overflow: Adapted from *Information Pack: Stage 2 Commissioning (PMU, 2019)*
The Te Mato Vai treatment system has been designed assuming wastewater can be drained to natural waterways.

Withholding information: Ecology report

This default guideline value is for fresh waters of pH > 6.5 and provides a 95% level of protection. There are a number of factors listed in the Guidelines that can affect the toxicity of the aluminium – I have indicated whether these factors are positive for the possible effects on the streams’ environment (✓), or unknown (?), or negative (✗):

- Toxicity to fish and invertebrates is increased at low pH (e.g. <5.5) and high pH (e.g. >9): likely to be ✓
- Toxicity reduced by complexing with fluoride, citrate and humic substances. The effect of organic complexation requires experimental determination: humic substances present in NOM so likely ✓
- Toxicity is reduced in presence of silicon: ?
- Toxicity reduced at high water hardness (high calcium concentrations): based on Watercare sampling hardness is reasonably high under dry weather conditions, so likely to be somewhat of a ✓
- Increased temperature may increase aluminium toxicity: ✗
- No data on salinity effects: Low salinity, so this is not material
- No data on effects of suspended particulate matter: ?
- Toxicity of aluminium may be affected by presence of other metals: ?

Discharge from Ponds: PACI toxicity assessment in Watson, 2020

The expert review was intended to help resolve or narrow issues raised in a proceeding between landowners and the Crown — to establish an access agreement.

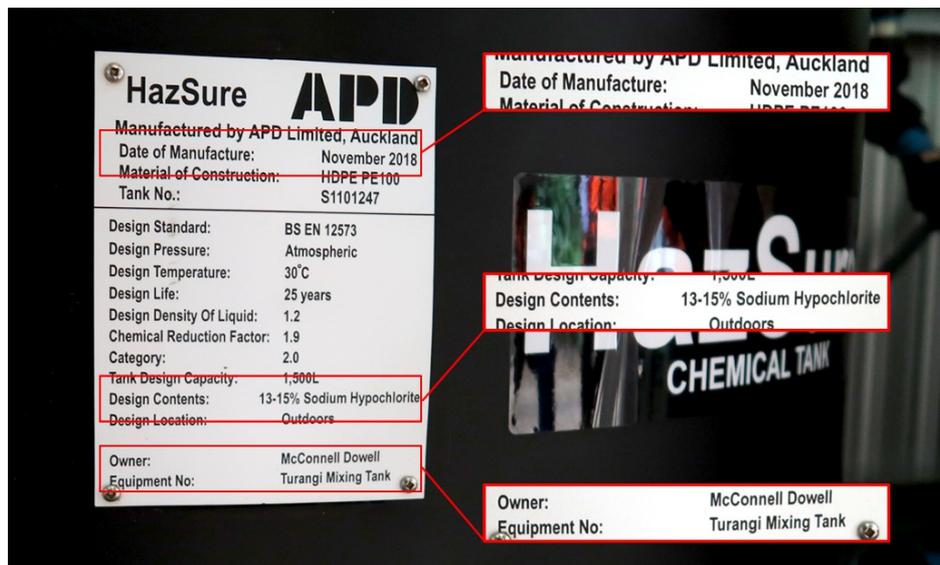
95. In expert review, Watson could offer no conclusion regarding the toxicity of PACI waste *Discharge from Ponds*; (see above) and proposed that landowners should be provided with the ecology report that had been finalised by GHD in Feb 2020.
“Given the number of unknowns ..., and I suspect the rather unique freshwater ecology of the streams of Rarotonga, I think the recent ecological report study (referred to in Mr. Free’s letter to me dated 4 March) should be circulated to the parties.” (p.15)

96. The ecology report was not released to landowners. It was withheld by the PMU on the grounds that it would form part of a PACI-use EIA.
"...The stream ecology report forms part of the PACL EIA which is still in progress and will not be released until the PACL EIA is submitted."
 - Taoro, T. (PMU), email, 30 Sept 2020
97. Landowners could not use the ecology report when consider the potential risks of operation prior to the PACI-trial commencing; yet landowners were pressured to provide approval for the method.
After last minute talks with land-owners went right down to the wire yesterday, the Government has instructed contractor McConnell to begin turning on the taps. Most land-owners of the 10 water intakes have agreed to a six-month trial of poly-aluminum chloride...
 - Cook Islands News, 30 Nov 2020
98. The landowners were not *adequately informed* to be able to provide consent.
99. The ecology report was released in December 2020 due to an *Official Information Act* request by TVOM — two months after the PACI trial had commenced.
 The TTV PACI-use EIA is yet to be submitted.

A predetermined outcome

When decisions pre-empt public consultation, then the consultation is a charade.

100. May 2019 the PMU held vaka presentations on the proposed water disinfection method. It was then found that chemical dosing facilities had already been constructed, and that the new water authority had initiated procurement of chemical supply.



Turangi waterworks, disinfection tank

Production plates suggest the disinfection decision was made mid-2018.

TE MATO VAI PROJECT GRIEVANCE

101. Landowners were notified of the treatment methods and operational processes after the Te Mato Vai infrastructure had been constructed. Consent or objection is a moot point when the system has already been designed and built.
102. The Te Mato Vai system has constructed assuming that waste can be discharged to natural waterways.
103. Communities have not been consulted regarding stream discharge.
104. The public should not be required to mount a case against an activity that is prohibited by the *Public Health Act*.
105. In March 2021 it is believed that supplies of PACI have been procured. This is despite To Tatou Vai having yet to file the Tonkin+Taylor PACI-use EIA Report.

GHD NEW ZEALAND

GHD New Zealand are the Te Mato Vai Project Management Unit (PMU), and are responsible for managing the construction, commissioning, and trialling of the new water infrastructure. As Principal they direct the construction Contractor (for Stage 2, MacConnell Dowell).

GHD also has a role in the co-ordination of engagement activities, and managing public relations.

Perception management

GHD has been active in refuting public critique of the Te Mato Vai project: reshaping the psychology of public understanding by selectively publishing or withholding information.

No stream discharge

106. The PMU has made misleading statements:

*“As Te Mato Vai commissioning gets underway, we would like to highlight that **the project holds all the necessary National Environment Service permits, and we have not, and will never be discharging chemically-treated water into our streams.**”*

- Te Mato Vai, 1 Dec 2019 [Facebook]

As detailed elsewhere in this grievance, neither of the highlighted statements is correct.



Te Mato Vai Facebook Post: 1 Dec 2019

Disinfection alternatives

107. When a local company proposed that an environmentally-friendly chemical could be used for water disinfection, the PMU and To Tatou Vai issued a joint statement labelling anolyte: '*weak chlorine*'. (Cook Islands News, 6 April 2019)

- The active (biocidal) properties of anolyte (HOCl) differ from those of chlorine (HCl).
- Contrasting the disinfection methods in this way misrepresents the properties that make anolyte more effective against illness-causing micro-organisms.

Soil health

108. When organic growers expressed concern about the impacts of water treatment chemicals on soil health, GHD responded with a media release entitled *Chlorination confirmed safe for organic farming* (PMU, 1 Aug 2019).

- The PMU minimized grower concern by shifting the focus from *organic principles to certification standards*: arguing that there was no specific prohibition of chlorinated water supply; and that chlorinated water is permitted for washing crops and cleaning food surfaces.
- The *Pacific Organic Standard* (POS) principles of Health, Ecology, and Care are about *sustaining soil health using living ecological systems*. As a synthetic (non-natural) input that negatively impacts soil and plant biology, chlorine is fundamentally anti-organic. (Secretariat of the Pacific Community, 2008 [White paper])
- In June 2020 a new POS guideline was released. Organic growers are directed to investigate the method used to treat the public supply and consider an intervention step to remove chemicals if water will be used for irrigation purposes. *“Physical filtration typically does not affect water quality, however, chemical treatment methods may pose a risk to organic integrity by affecting the bacterial content of the water and the health of soil microorganisms.”*
- Secretariat of the Pacific Community, 2020 [White paper]

Agricultural re-use

109. GHD proposed to landowners that PACI sludge could be reused for agricultural purposes.
"The use of this sort of sludge to help plant growth has also been studied by SEQ Water (Queensland Government Bulk Water Supply Authority) in Queensland, Australia. In that case it was shown to increase plant growth as the particular sludge also contained phosphorus and trace mineral nutrients which acted like a fertiliser for certain plants."
- Sloan, D., Cairney, S., & Free, P. (GHD), memo., 31 Oct 2019. *Information Pack: Stage 2 Commissioning: Appendix 4*. PMU, 2019
110. PACI sludge is not suitable for crop production. Dissolved aluminium bonds with phosphorus, making this essential nutrient unavailable for plant growth.
"...because of the binding up of phosphorus, extra fertiliser may be required to obtain the desired crop yields, or productive soil stripped and reinstated once filling with sludge has been completed."
- Watson, 2020. p.37
111. During intake site visits, PMU staff informed landowners that PACI could be used in agriculture. Landowners understood from this advice that PACI sludge could be used in food crop production (e.g. for growing taro).
"...can you direct me to the research you mentioned about PACI sludge being used for gardening/agriculture. Based on discussions with you at the Turangi site visit, there are landowners who are under the impression that PACI sludge is beneficial for food crops."
- Flanagan, J., email, 27 May 2020
112. After sustained enquiry the PMU conceded there were insufficient references to support agricultural reuse (but issued no public statement to address the misinformation):
"Upon further review of the research we have found that the information does not demonstrate enough depth to reference and does not relate specifically to the local context of Rarotonga."
- Huynh, C., email, 9 July 2020

Diversiónary reframing: The non-science of waste management

Late 2020, the PMU staged demonstrations using water treatment waste. Although not proposed by GHD to be 'scientific', the apparent intent was to diffuse public (and specifically landowner) concern regarding the toxicity and environmental impacts of water treatment residuals.



This is sediment

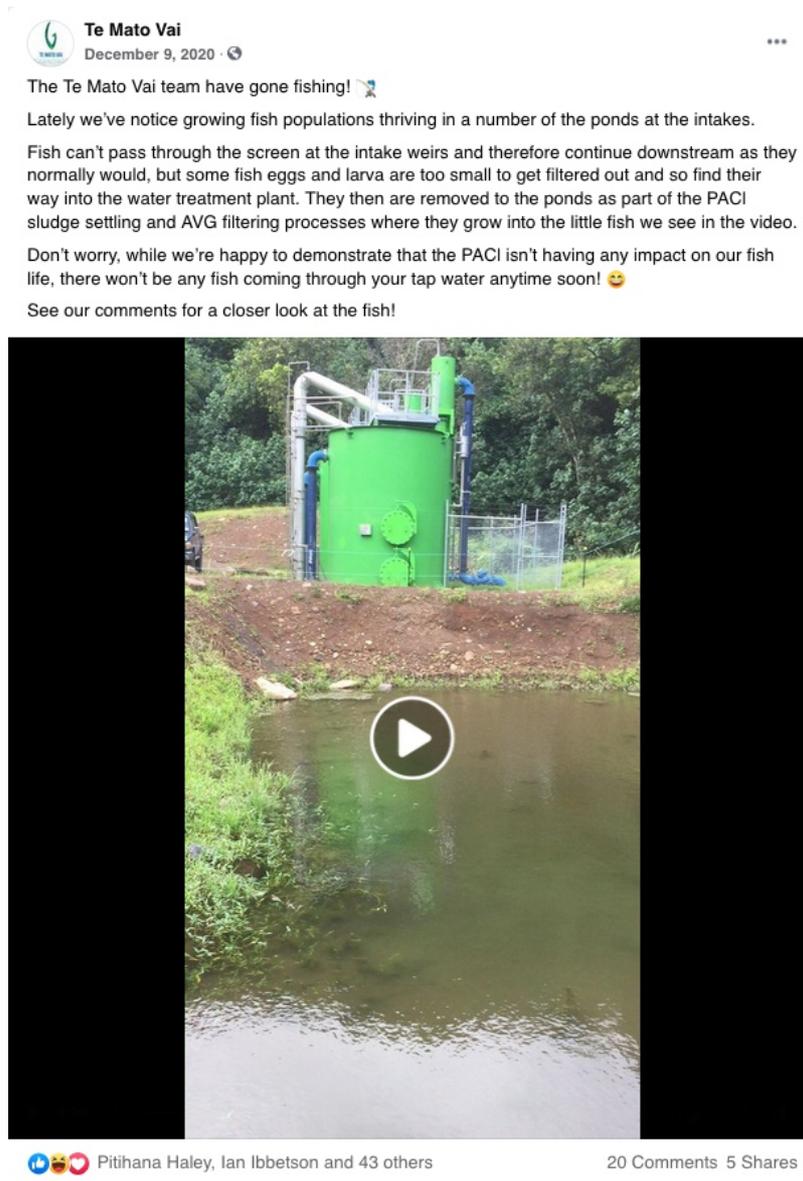
Caption in source: "Polyaluminium chloride 'sludge' after removed from a backwash/scour pond. Officials are yet to determine on a disposal method for treatment by-products".

Cook Islands News, 28 Nov 2020.

Comment: The properties of sediment change after long-term storage.

113. Sediment from a settling tank was presented at landowner intake site visits (attended by the media); operators collected fish from an onsite wastewater storage pond; sediment was dried under office air conditioning units; and the project manager grew tomato seedlings in settling tank sediment.

TE MATO VAI PROJECT GRIEVANCE



The Te Mato Vai team have gone fishing!

Facebook post, 9 Dec 2020

114. The presence of fish in the storage ponds is not proof that wastewater or sludge has no impact on biodiversity; or that fish exposed to PACI waste will be fit for human consumption.

- Aluminium builds-up (*bioaccumulates*) in the tissue of freshwater species (Landman, 2008). The impacts of sustained exposure to dissolved aluminium may not be acutely toxic; or result in any change in outward appearance.
- Intermittent changes to streamwater quality can trigger avoidance behaviours (Landman, 2008); and may disrupt spawning cycles (GHD, 2015, *Stage 2 EIA Report*).

115. Sediment (collected from the Ngatoe settling tank) was described by GHD as (PACI) 'sludge'.

- **The properties of material containing aluminium hydroxide change over time .**
When stored for an extended period of time — as it will be in the storage ponds — aluminium hydroxide settles and forms the mineral *gibbsite*.
"...flocculated Al(OH)₃ undergoes an ageing process, changing from a colloidal amorphous solid to microcrystals, and then to the mineral gibbsite...this process may take up to a year."
- Tempero, 2015
- Experimentation using *settling tank sediment* is not an appropriate method for determining the properties or processing of *storage pond sludge*.

Summarising stream health

In December 2020, the PMU issued a media release based on the findings of the *Te Mato Vai Aquatic Ecology Baseline Report*. This media release broadly misrepresents the health, and minimises the ecological significance, of Rarotonga's freshwater ecosystems.

116. The media release leads with the results of historical Ministry of Marine Resources (MMR) water testing:

- *Water quality (bacteria, nutrients, dissolved oxygen) of the streams on Rarotonga has been consistently poor for several years.*
- *Nutrient concentrations have been consistently elevated in most streams. This is likely due to farming and the naturally high concentrations of phosphorus from the volcanic geology of Rarotonga.*
- PMU, 21 Dec 2019 [Release]
- The MMR water samples were collected on the coast; at points where streams discharge to the lagoon; after flowing through developed agricultural and residential areas. Such samples are not representative of water quality at the remote, inland, elevated intake points.
- The GHD Australia ecologists spot-sampled water quality parameters at the time of the stream survey, but not bacteria or nutrient-levels.
- Rather than "*consistently poor*", the ecology report summarises the *aquatic habitat* at the intakes as: "*either 'good' or 'excellent' condition...*"

117. Reference to *keystone species*¹⁰, and *food web* are made in the media release; but were not included in the ecology report.

Our ecologists did not observe any keystone species during the field survey or desktop review, so we would not expect the food web to collapse.

- PMU, 21 Dec 2019 [Release]

- ‘Keystone’ was not a value used to classify the species recorded in the survey. An *omission* from the report was misrepresented as a *finding* of the field survey.
- The ecologists observed and recorded *Decapoda (kōura)* as part of the stream survey. *Kōura* are likely to be a keystone species in Rarotonga’s streams and have a key role in the food web.
“Kōura are a keystone species in freshwater ecosystems and have various ecological functions. They act as shredders, detritivores¹¹, scavengers and predators. They keep the lake bed clean and are an important link in the food web.”
- Aotearoa Lakes, 2021
- The ecology report states there are few references upon which to base an assessment of biodiversity values (and the consultants did not conduct relevant research activities as part of the stream survey):
“There is currently limited published knowledge on aquatic macro invertebrate communities of Rarotonga”.
- Pratt. L., 2020

118. Phrasing taken from the ecology report would likely be misunderstood by a general audience to mean that Rarotonga’s freshwater biodiversity is of limited (ecological) value:

...the diversity of freshwater fish species is very low and there are no threatened freshwater fish species on Rarotonga.

- PMU, 21 Dec 2019 [Release]

- The implication of *very low diversity* is that fewer species occupy the same ecological niche; and that stream communities are therefore more sensitive to disruption.
- Although no *threatened* species are listed, others are identified as *Rare, Uncommon, and Endemic* (native and potentially unique to Rarotonga).

¹⁰ Keystone species play a critical role in maintaining the structure of an ecological community. Without its keystone species, the ecosystem would be dramatically different or cease to exist altogether.

¹¹ Detritivores play an important role in the breakdown of organic matter from decomposing animals and plants.

Potential conflict of interest

An Environment Impact Assessment is currently underway for the operational use of PACI. The proponent is the new water authority To Tatou Vai.

119. The Terms of Reference (ToR) for the To Tatou Vai PACI-use EIA was written by GHD
The EIA should only assess the activity of using PACL during operation of the water treatment plants.

- To Tatou Vai Ltd, 2019

120. The contract was awarded in two parts:

- **Tonkin+Taylor** are to submit the To Tatou Vai EIA Report on the operational use of PACI.
- **GHD** was awarded the contract to describe the baseline environment (ecology report), and conducted the stream survey.

121. If valued at over \$30k, MFEM procurement policy requires that the ecology contract be publicly advertised and three quotes obtained. An OIA request for the contract value has not been answered.

122. There are apparent conflicts of interest, when GHD:

- both manages Te Mato Vai project, and the PACI trials (assessing the suitability/effectiveness of the method);
- wrote the Terms of Reference for the EIA on the operational use of PACI after the infrastructure has already been constructed; and then later either revised the terms of reference/and or ecology report¹²; and
- is awarded a research component critical to the EIA.

¹²The terms of reference directed consulted to assess only the impacts of PACI-use. The ecology report contains extensive information on the potential impacts of chlorine.

NEXT STEPS

Te Vai Ora Maori does not challenge the goal of improving Rarotonga's public water supply system.

However, infrastructure projects must also observe the law of the country, and development activities are bound by regulatory process. This ensures that the chosen solution is culturally-appropriate and environmentally responsible.

In response to this grievance, the following actions are proposed:

- The specification and operation of the Te Mato Vai water treatment system must comply with the laws of the Cook Islands.
- A cross-agency inquiry is required to investigate governance of the Te Mato Vai Project. CIG agencies must be required to work through the prescribed regulatory processes; and in the correct order. It seems that additional oversight is required to ensure that such processes are followed.
- Commitment must be made to genuine (open) public consultation; *prior* to decision-making.
- A method of operation must be implemented that meets the needs of stakeholders without jeopardising the environment.
- Environmental incidents must be investigated and acknowledged with findings reported to the public. As necessary, restoration and mitigation activities should be undertaken.
- Use of the media should be to inform rather than seeking to reframe public perception. Officials cannot use statements to the press as a replacement for public consultation.

CONTACT DETAILS

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REFERENCES

For online references, a website link has been provided.

Offline references **(AP)** are available for download; and **personal communication** (letters, emails, etc.) are also available. To access, send a request to justine@islandbooth.com.

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TE MATO VAI STREAM DISCHARGE

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APPENDIX A: PERMITTING PROCESS

The *Environment Act 2003* requires a project permit prior to development in areas of *specific concern*. A formal evaluation process allows for critical engagement with the proposed development; **risks can be identified and mitigated before an activity takes place**.

The outcome of genuine consultation is an appropriate, localised solution supported by stakeholders.

The development activity permitting process

The National Environment Service administers and provides secretariat services to the development permitting process, prescribed by the *Environment Act 2003*.

123. When a development activity will be carried-out in an area of specific concern, the person or agency must obtain a permit through the National Environment Service (NES). Application does not guarantee that a permit will be granted.
124. Where an activity has the potential for significant impact, an Environment Impact Assessment (EIA) may be requested.
The objective of the EIA is to identify potential environmental, social and economic impacts of the proposal and to ensure that adverse impacts are avoided where possible.
- NES, 2014
125. When undertaking an EIA process, a Terms of Reference (ToR) is prepared for the applying person or agency (proponent).
126. The ToR provides a document framework and details the research activities to be completed. These activities include consultation with affected stakeholders such as traditional leaders, government agencies, civil society organizations, interest groups, and the general public.
127. Responding to the ToR, the proponent directly prepares (or commissions) a formal research report. The EIA Report:
...should be a self-contained and comprehensive document containing sufficient information to make an informed decision on the potential impacts.
-ibid.
128. For development in Rarotonga, an EIA Report is submitted to NES, who liaise with the permitting authority, the Rarotonga Environment Authority (REA).
129. The membership of the REA is described in the Environment Act. As the Rarotonga *Konitara Vaka / Vaka* Councils have been dissolved, the current membership is four public members appointed by Cabinet/The Minister, plus the MPs of Rarotonga.
130. After initial consideration by the REA, the EIA Report is published for public feedback. Publication is through the NES website and/or as a hard copy document distributed through community centres, shops, etc. A 30-day response period is required to allow public submissions to be made and then considered by the REA.

131. *(7) After the permitting authority [the REA] has reviewed and assessed the application and all relevant information including the environment impact assessment, it shall, subject to guidelines (if any) prescribed by regulations*
(a) issue a permit for the proposed project specifying the terms and conditions subject to which the permit is issued;
- Environment Act 2003

APPENDIX B: ENVIRONMENTAL INCIDENTS**Turangi**

Since July 2019, five environmental incidents linked to Te Mato Vai construction and commissioning activities have been observed by members of the community. These incidents concern either the deliberate or accidental discharge of wastewater to streams. Rather than identifying the cause, investigation by the contractor and operators has largely been concerned with establishing plausible deniability.

132. July 2019 a die-off incident was observed following the discharge of water from a storage tank. It was later found that a similar incident has been observed in the Avana valley: a fisherman removed kōura carcasses from the stream. The PMU responding by denying chemical use; but refused to release the requested workplans (Construction Execution Plans or hazard registers) from the week leading up to the incident. Later the contractor claimed that streamwater testing had been conducted, but refused to release the laboratory report.
133. Turangi was the first of the new facilities to be completed, and what is now understood to be a hydraulic testing process would also be followed at the other nine sites.
134. Due to the lack of resolution, a ‘whistle-blower’ report was filed with Deloitte & Touché requesting investigation of the activities carried-out by the contractor McConnell Dowell. The investigator did not provide any meaningful response. *“...according to our client (Aveng) the matter was investigated. Unfortunately we are not in a possession [sic] to inform you with details of the investigation and suggest that should you require further details please feel free to liaise with their office and or representatives in your area.”*
- Barnard, B. (Deloitte & Touché), email, 11 Sept 2019
135. Direct contact was made with the head office of contractor McConnell Dowell (Australia). A summary response was provided; but the request for the release of workplace plans (CEP) and hazard registers was not answered.
- *The water has been tested and shows no sign of contamination.*
 - *There was no disinfection or coagulant on site or used on site as you report.*
 - *The use of ALL chemicals on site is not permitted by the Principal [GHD].*
 - *The activity the person saw was the controlled release of water taken from the existing network pipe i.e. the release of water back into the stream from which it was originally taken with no processing or treatment of that water.*
- Response from McConnell Dowell contained in an email from Crystal Huynh (GHD), 10 Aug 2020

136. When reporting the incident, TVOM proposed chemical use as a *possible* cause of the die-off.
- Commissioning (sterilisation) follows construction; and requires the use of chlorine.
 - The water sampling sites were not identified by McConnell Dowell, but the collection of streamwater 4-5 days after discharge would be unlikely to provide any evidence of contamination: chlorine dissipates within 24hrs in sunlight; and contaminants would be diluted by mixing.
 - The contaminant may have been physical rather than chemical (e.g. soil or concrete dust).
 - Operators may have controlled the wastewater outlet valve; but the observed method was to attach a 6m pipe to the base of the storage tank, and angle it towards the stream bank. There was no erosion protection to minimise the physical impacts of the flow.
137. Review of workplace records would also establish who authorised the discharge of water to the stream (as stream discharge was not permitted as part of construction activities).
138. TVOM subsequently advised McConnell Dowell that the stream discharge of waste is unlawful, but received no response.

Takuvaine

139. Stream die-off was observed by residents living alongside the Takuvaine stream in Dec 2019.
140. The residents spoke with landowners visiting the intake site to witness commissioning activities. Interviews were filmed the following day.
"We hardly see any koura [and] tunas, which we usually go and hunt for kaikai. Hardly anything now. My son has seen dead eels which is unusual. But we don't know what is happening up there. No one tell us."
 - Roma Roberts, 17 Dec 2019,
 [interview: https://www.youtube.com/watch?v=Mvy4_CVYI7g]
141. The Takuvaine incident was reported to NES. NES did not investigate, claiming a lack of resource.
142. MFEM publicly discredited the resident account:
...the complainants were wrong. 'There was no evidence to back such claims', [Henderson] said, 'with no photos of the supposedly dead fish and eels the landowners say had died.'
 - Radio New Zealand News, 24 Dec 2019
143. The PMU provided landowners with affidavits from the water technicians describing the processes followed at the time of the Takuvaine incident.
144. The PMU's response was chiefly to establish plausible deniability — that die-off was not the result of planned discharge.

145. Operator affidavits outline the activities completed, and that *“no water treated with Calcium Hypochlorite was discharged to the Takuvaine Stream”*; but are not a record of events at the site.
The statements do not include the detail that landowners arrived to witness the commissioning process; or that operators failed to return to the site at the agreed time the following day to witness the draining of chlorinated water from the settling tank.
146. The commissioning process did not conform with the CEP that was agreed with landowners, to witness the release of the chlorinated water 24hr after dosing.
147. Engineering drawings; along with the risk identified (but not detailed) in Watson’s report suggest that unplanned overflow from the settling tank may have resulted in chlorinated water entering the stream.
148. Prior to Dec 2019¹³, NES were not provided with any environment monitoring reports, construction workplans, or engaged to observe construction processes. NES were not onsite to witness activities prior to the Turangi or Takuvaine stream die-off events.

¹³NES observations became necessary after dissatisfaction was voiced by traditional leader Pa Marie Ariki regarding the impact of construction works at the Papua site.

APPENDIX C: RESOLUTION PROCESS

This grievance has been filed with MFEM after previously seeking resolution with the PMU, other CIG agencies, and direct communication with the construction firm (McConnell Dowell).

Government agencies

Cook Islands government agencies have largely refused to answer concerns regarding regulation of Te Mato Vai construction and commissioning activities. Responses have been informal and often made by way of media comment.

The lack of clarity regarding responsibility for the management of the project has been compounded by the involvement of To Tatou Vai¹⁴.

149. TVOM raised the lack of a permit for the PACI trial with MFEM, PMU, and To Tatou Vai in Feb 2020 (Rasmussen, A., email, 16 Feb 2020).

- The (former) To Tatou Vai CEO responded:
"[Commissioning] has been agreed with landowners through a consultative process...".
 - Cook Islands News, 19 Feb 2020
- The *Environment Act 2003* makes no provision for a development to proceed on the basis of *landowner consent*.
- In a meeting with TVOM, NES disclosed that the counsel for Cook Islands Investment Corporation (CIIC) had offered an interpretation of the *Environment Act* to NES staff; proposing the Stage 2 Permit to be inclusive of the PACI trial. NES also sought the assistance of Crown Law, who agreed with counsel for CIIC.

150. TVOM filed a complaint with the Ombudsman in Feb 2020, requesting an investigation into the Te Mato Vai permitting process. (Kirkwood, A. (TVOM), 2020)

- MFEM's response was to refer to the landowner court proceeding: *"this matter has already gone to court"*. (Henderson, G. quoted in Ombudsman's letter, 29 April 2020)
- After eight months, and despite assistance from the New Zealand Ombudsman's Office, the Ombudsman advised that the investigation could not be completed due to a lack of co-operation from the government agencies.
"...unless we have in hand the information sought and the assistance requested it is in my view not viable at this stage for this office to continue the investigation."
 - Tearea, N., letter, 9 Oct 2020

¹⁴Prior to appointment of the current CEO.

151. July 2020 it was (again) announced that dosing of PACI was to commence. TVOM filed a complaint with NES asserting that a development permit was required for the use of PACI; and that proceeding without a permit was an offence under the *Environment Act 2003*.

- The complaint was substantiated with reference to the March 2020 expert report assessment of the August 2015 Stage 2 Construction EIA Report. (Flanagan, J., email, 17 July 2020)
- The NES Compliance Manager acknowledged receipt of the complaint; but did not provide a direct response. (Tangatataia, V., email, 18 Aug 2020). He referred to a news item containing statements from the Minister of Finance and NES Director.
- The Minister made a number of statements that did not answer the complaint.
- The NES Director mentioned that the Stage 2 Construction Permit had been *extended*, but not that it authorised chemical-use or stream discharge. *“...the [Stage 2] permit was not for the long term options of water treatment, ‘that would be a full EIA (Environment Impact Assessment)’”*.
- Nga Puna quoted in Cook Islands News, 20 July 2020
- Use of PACI *is* the proposed *long term option* for water treatment; and use of PACI started at Ngatoe 28 Sept 2020.
- Permit documentation shows that in July 2019, the Stage 2 permit timeframe/expiry was changed; but that the activities were unchanged. *“Please be advised that your request has been approved since there are no changes to the original proposals and plans.”*
- Puna, N. (NES), 1 July 2019, [Permit extension]
- The *original proposals and plans* are those in the 2015 EIA Report; and do not include use of chemicals for water treatment; or management of waste.

GHD Australia Integrity Officer

152. September 2020 TVOM filed a complaint to the GHD Australia Integrity Officer regarding the PACI trial and the conduct of GHD New Zealand. GHD Australia committed to an internal review, but declined to provide any formal response to the complaint.

“...this is an internal and confidential process and as such you should not expect further communication from me unless I send you a request for more information.”

- Obst, D., email, 8 Oct 2020

New Zealand Government: Development partner

The New Zealand Government is a development partner and member of the Te Mato Vai Project steering group — however the response to the public seems at odds with development policy.

153. TVOM approached the New Zealand High Commission (NZHC) in Oct 2020 seeking to file a grievance regarding the Te Mato Vai Project. The initial inquiry sought detail of development project evaluation and resolution processes.
154. To ensure genuine (rather than pre-emptive) consideration of the grievance, TVOM disclosed the minimum of detail sufficient to demonstrate the legitimacy of the concern:
“The matter is the failure of the Principle to observe the applicable policies and regulations of the Cook Islands; as set out in legislation, and identified in the terms of the Te Mato Vai Stage 2 Construction Project Permit (2015).”
- Flanagan, J. (TVOM), 28 Oct 2020
155. NZHC diplomatic staff provided reassurance that details of the resolution process would be forthcoming. However, the eventual response was:
“...we are satisfied our Partners are meeting their obligations to progress this activity.”
- Moananu, O. (NZHC), email, 2 Dec 2020
156. Neither the NZHC nor the New Zealand Ministry of Foreign Affairs and Trade (MFAT) had been provided with a formal grievance. Management of the Te Mato Vai project is not in accordance with New Zealand’s International Development Principles:

Principle 2: Inclusive:

- *enabling groups potentially impacted by an activity to meaningfully participate in the development process*

Principle 3: Resilience:

- *identifying and managing negative impacts on the environment, and promoting sustainable management of natural resources*
- *promoting the protection and enhancement of ecosystems*

Principle 4: Sustained:

- fostering more accountable institutions;...
We will promote institutional accountability and transparency in the organisations that we partner with, and support local civil society’s capacity to engage.

Seeking dialogue

Objections have been clearly articulated, using the appropriate mechanisms, and in a timely manner.

Since mid-2019, Te Vai Ora Maori has attempted to engage officials in dialogue about the Te Mato Vai treatment system.

Along with seeking to enforce provisions under legislation; efforts include community consultation, a public petition, protests, and a submission to the *To Tatou Vai Authority Bill* select committee.

157. A public petition was drafted in June 2019 seeking dialogue on the treatment method and water charges. The petition was presented to Parliament 17 June 2020, but a select committee has yet to be appointed. (*See Appendix: Two public petitions — no dialogue*)
158. In Oct 2019, TVOM invited all MPs to attend a presentation on alternatives to chemical treatment. Aside from Tina Browne (Leader of the Opposition), none attended.
“We kindly invite you to attend a Public Meeting about our Water. This is a great opportunity for some open debate; safe clean water is important to all of us.”
- Rasmussen, A., email, 30 Sept 2019
159. A few weeks later, TVOM approached the Minister to arrange a meeting.
“Te Vai Ora Maori request a meeting with you to present non-chemical water treatment options. The proposed methods only require minor changes to the new Te Mato Vai system infrastructure. ... Non-chemical methods are culturally and environmentally appropriate, sustainable and cost-effective.”
- Rasmussen, A., email, 9 Nov 2019
160. Sept 2020, TVOM presented to the To Tatou Vai Authority Bill select committee, presenting on the issues of waste management, chemical costs, and alternatives.

APPENDIX D: TWO PUBLIC PETITIONS — NO DIALOGUE

Two public petitions have failed to achieve formal public dialogue with the Cook Islands Government regarding the new water treatment system. The handling of the petitions also points to a pattern of frustrating public engagement to expedite infrastructure construction.

Te Mato Vai Petition (2014)

161. Unfavourable responses to the planned water upgrade (such as the treatment methods and user-pays) from mid-2013; coming after the public announcement of the project by CIG officials at the 2012 Pacific Forum.
162. In 2014, island wide consultations were held on the *Te Mato Vai — Water Supply Master Plan for Rarotonga*. Over 500 people attended the nine meetings. (Cook Islands News, 4 Feb 2014). However public resistance to the details of the plan continued to mount: servicing of debt; the lack of research; and ability of the new system to meet water demand in drought conditions.
163. 5 Feb 2014 the Te Mato Vai public petition was announced through the Cook Islands Herald. Before the next sitting of Parliament the petition had attracted nearly 2,500 signatures (1946 signatures after verification by Parliamentary staff). (Cook Islands Herald, 5 Feb 2014)
164. 12 Feb 2014 two formal letters from representative groups were published in *The Cook Islands Herald* seeking intervention from the New Zealand Government; one from citizens to the CIG and New Zealand Ministry of Foreign Affairs; the other from intake landowners to the New Zealand High Commission regarding land-access rights. (Cook Islands Herald, 12 Feb 2014)
165. Cabinet issued a press release (written by GHD) refuting each of the petition grievances, and prior to the presentation of the petition to Parliament. (Cook Islands Herald, 2 April 2014)
166. Processing of the petition was derailed when it was presented to Parliament 4 April 2014. The petition was not referred to a Select Committee (Cook Islands Herald, 9 April 2014).
167. Appointment to a select committee was delayed until 2016 — and The *Te Mato Vai Special Select Committee Report* was not tabled in Parliament until June 2017.¹⁵
168. The delay made consideration of a number of grievances academic as construction processes had continued. For example, petitioners sought investigation of alternative solutions (in 2014) when pipeline construction was near completion (in 2017).
169. The Select Committee process did not comply with Standing Order 355. Standing Order 355 requires that the report that is presented to Parliament has been agreed to by the committee. This was not the case with the report presented by Chairperson Hon. Mark Brown. (Parliament of the Cook Islands, 2017)

¹⁵Standing Orders require Select Committee reports to be returned within three months of presentation of a petition to Parliament.

TE MATO VAI STREAM DISCHARGE

- “A report was tabled in Parliament and it wasn’t from the Select Committee.”
— Beer, J., letter in Cook Islands News, 2 June 2018
- The main content of the report is an updated version of the media release issued by Cabinet (written by GHD) in 2014 refuting the petition grievances.



1. Cook Islanders are fundamentally opposed to paying for water so any water project premised on vague and uncertain ‘user pays’ principles is unacceptable.

Cook Islanders already pay for water.

Cost are a combination of their taxes and purchasing potable water from commercial vendors and recently very expensively – even when subsidised by ICI – by having to buy truck-loads over this past summer. Families in some villages never received a drop of water down the water main for two months over the Christmas/New Year period and were having to buy a tank full of water every week to satisfy their family needs.



1. Cook Islanders indirectly already pay for water.
2. Cost are a combination of their taxes and purchasing potable water from commercial vendors and recently very expensively even when subsidised by ICI – by having to buy truck-loads over the summer months. Families in some villages never received a drop of water down the water main for two months of the year (2014) over the Christmas/New Year period and were having to buy a tank full of water every week to satisfy their family needs. During this period eight trucks and their crews worked 24 hours a day to try and keep up with the need for water.

Left: A Response to the Te Mato Vai Petition Points. Cook Islands Herald 2 Aug 2012.

Right: Report of the Te Mato Vai Special Select Committee, June 2017

The (2017) Select Committee report is largely a repurposed (2014) Cabinet media release.

Anti-chemical Treatment of the Water Supply of Rarotonga (2020)

Parliamentary process was also abused on the presentation of the *Anti-chemical Treatment of the Water Supply of Rarotonga Petition (2020)* — 1433 signatures.

170. This petition was drafted after the Minister of Finance made statements regarding water treatment methods in the June 2019 sitting of Parliament. The prayer of the petition calls for water to remain free to households; and for the implementation of physical water treatment methods.

171. There was initially confusion regarding the outcome of the motion to read the petition (aloud); leading to debate in Parliament.

“All petitions shall be ordered, without question put, to lie upon the Table and shall then stand referred to a select committee appointed by Parliament. It does not say all those petitions except those declined to be read. It says ALL petitions shall be referred to a Select Committee. All that we voted on was that it should not be read by the deputy clerk.”

- Hon. Tina Browne, 19 June 2020, [Hansard]

“If the motion is agreed to, the Clerk shall read the petition. By that which means, if the Petition is defeated then there is no Petition. So Standing Order 82, which the lawyer from the Opposition has focused on, becomes redundant.”

- Hon. Tingika Elikana, 19 June 2020, [Hansard]

172. As the Westminster system is shared by both countries, TVOM sought assistance regarding the interpretation of Parliamentary Standing Orders from the Clerk of the New Zealand House of Representatives.

A request to contact the Clerk was made through the New Zealand High Commission (NZHC) in order to resolve the matter within the June-July 2020 sitting of the Parliament of the Cook Islands.

173. The NZHC did not further the request but in reply expressed support for the aims of the Te Mato Vai Project, and a flawed understanding of the landowner court proceeding:

“New Zealand is a partner of the Cook Islands Government in the delivery of the Te Mato Vai project and we share the objective of Cook Islands for Te Mato Vai to deliver safe drinking water to the people of Rarotonga.

As a member of the project's steering committee, we understand the concerns of Te Vai Ora Maori are currently being considered by the Cook Islands judiciary.”

- Bennett, R. (NZHC), email, 25 Jun 2020

174. After having received guidance provided to TVOM from the Clerk of the UK House of Commons, the Speaker acknowledged:

“...a petition that is in order will be referred to a select committee whether or not it has been read under Standing Order 81.”

- Speaker Niki Rattle, 1 July 2020, [Hansard]

175. The Speaker then determined to reject the petition based on an interpretation of the prayer; and the petition was not referred to a select committee.
- Standing Orders do not call for Speaker to interpret the text of a petition.
 - After endorsement by the Clerk; and on presentation to Parliament; all petitions must be referred to a select committee for consideration.
176. Given the sustained abuse of Standing Orders, TVOM requested the Opposition raise a motion of (non)confidence; and then publicly called for the resignation of the Speaker.
177. The Speaker resigned in Feb 2021.
178. The petition is yet to be referred to a select committee.