



17 June 2020

REPORT ON FIRE AND EMERGENCY NEW ZEALAND OPERATIONAL IMPACT AT MATAURI BAY (CAVALLI VOLUNTEER FIRE BRIGADE)

Subject	Analysis of the Operational Impact of Fire and Emergency New Zealand on the local community of Matauri Bay, Far North District.
Ref	P&P/2020/06/17

Purpose

1. Fire and Emergency New Zealand (FENZ) response capability at the locality of Matauri Bay on the eastern fringe of the Bay of Islands is currently met by the Cavalli Volunteer Fire Brigade (VFB - rural). This report looks at operational impact of that VFB by reviewing the Census 2013/2018 statistics, National Risk Resource Modelling (NRRM), incident rates, response times and incident types whilst also summarising background information of the community.

Background

2. Fire and Emergency New Zealand formed on 01 July 2017 amalgamating the New Zealand Fire Service with rural fire entities from across the country forming one unified organisation. Prior to 01 July 2017, Cavalli VFB was formally a Rural Fire Party of Northern Enlarged Rural Fire Authority. Under FENZ, Cavalli VFB is overseen by the parent business unit of Northern Whangarei Kaipara Rural Fire District who have taken responsibility for overseeing the VFB since 01 July 2017.

Community Description

3. Cavalli is located to the northeast of Kaeo, just inland from the coast at Matauri Bay, north of the Bay of Islands. While Matauri Bay is the correct geographical settlement location, this report will use "Cavalli" as the reference to location, as it is the Fire Station name and the term is in common usage. Cavalli VFB has its own First Response Area (FRA), separate from neighbouring Kaeo. Cavalli is isolated, with one main road (Matauri Bay Rd, including access from Martin Road) accessing the area, which then takes a circuitous route around the coast via Whangaroa to return to SH10 north of Kaeo. The town of Kaeo is an approximately 20min drive away.

4. At June 2020, there is no formal Fire Station to house Cavalli VFB. Attached at Enclosure 1 is a map showing the locality of Matauri Bay and three sites indicated; the old Fire Station site that is no longer in use, the current land site for a future Cavalli Fire Station (30-year lease held), and the location of a local farm shed that currently houses the Cavalli Fire Appliance for security purposes.

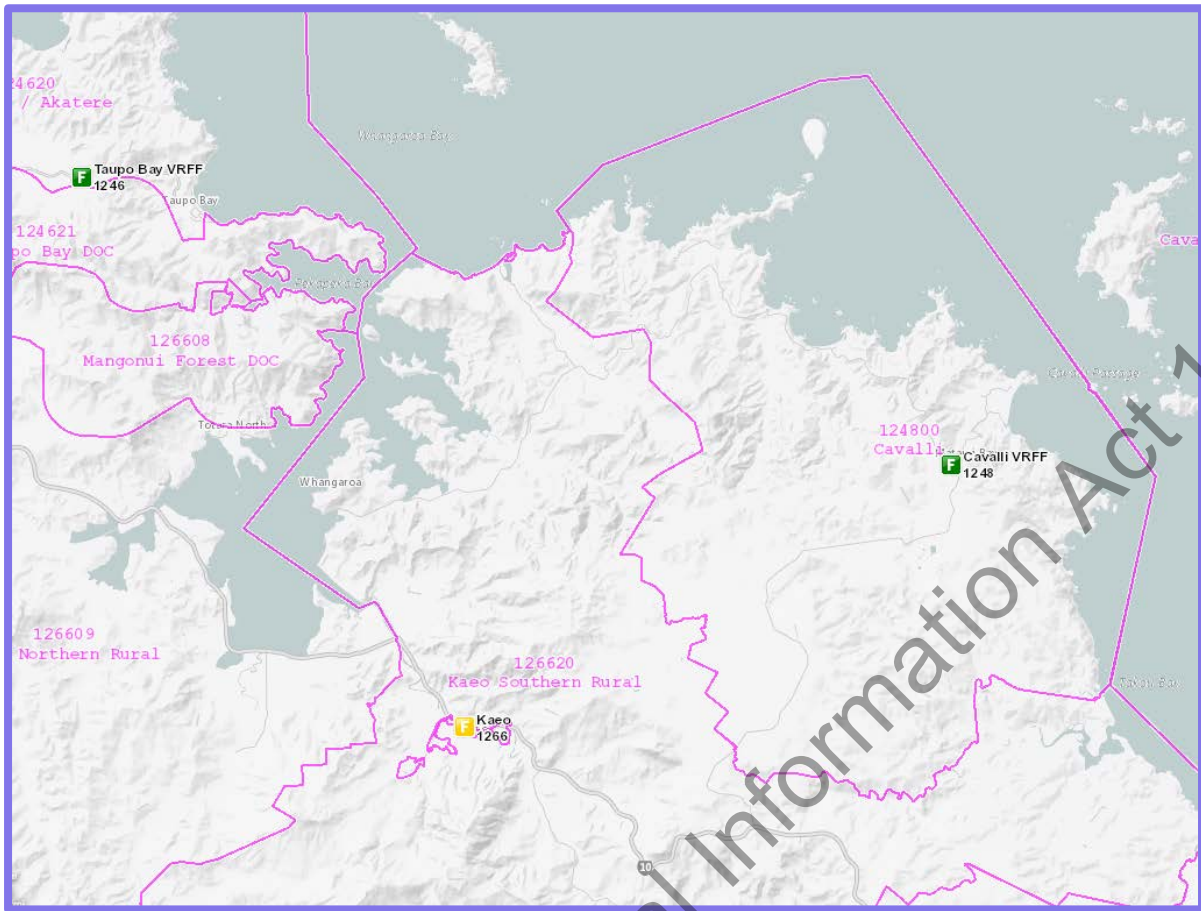
5. Cavalli's FRA comprises a 2020 estimated population¹ of 549 persons across 102 SqKm. In terms of having a population pool close to the Fire Station in order to draw a volunteer establishment from, 324 persons are recorded by Census 2013 as living within five minutes' drive time of the current fire station location. By comparison the 2020 population estimated for the neighbouring Kaeo VFB is 2195 persons.

6. Cavalli's population is 67%-55% split between Maori and European, with fewer than 20 other people identifying as any other ethnicity. The population is around 25% children under the age of 15, as well as a majority aged between 15 and 64, with only approximately 17% older than 64², which suggests a resident population that works on local farms, businesses or travels to nearby Kaeo for work, rather than resident retirees. The median household income in the FRA is \$32,100³, well below the median household income for the Far North of \$42,200 and NZ of \$63,800.

¹ NRRM Station Profile (accessed through SMS)

² NRRM Station Profile (accessed through SMS)

³ Statistics NZ (2020) House Labour Force Survey (summarised in Northland FENZ Local Profile)



Map of Cavalli showing relationship with Kaero.

7. The Geographic profile of Cavalli FRA is tabulated below, and sourced from the Land Cover Database (LCDB) and internal data sources (SMS etc).

Station Name:	Cavalli VFB (Rural)	Station ID:	1248
Page 1: Geographic Profile (Primary Source: NZ Land Cover Database (LCDB)).			
Size of FRA	102 SqKm. 81 % lesser than the national mean of 531 SqKm		
Built Environment (All):	0.3 SqKm. 0.29 % of total FRA.		
Built Environment => 8 stories:	0 Buildings in FRA over 8 storeys. Taken from SMS Place Data.		
Vegetation / Isolated Structures:	75.4 SqKm. 74.9 % of total FRA.		
Forestry:	24 SqKm. 23.8 % of total FRA.		
Other(give detail if more than 5%) or is a significant risk feature:	0.9 SqKm. 0.89 % of Total FRA		
Availability of reticulated water	0 % of address points within the Built Environment is reticulated sufficient to meet the requirements of Firefighting Water Supplies Code of Practice		
Subjective Risks	Short Descriptions		
Built Environment Qualifiers: Residential Dormitory Suburb. Commercial Precinct. Industrial Precinct.	Remote area in the northern Bay of Islands. Characterised by farmland, vegetation and coastline/ beaches, with the main settlement of Matauri Bay (Cavalli) and coastal bach settlements as the built environment.		
Special Risk Built Environment:	Kauri Cliffs Luxury Lodge & Golf Course		
Special Risk Natural:	None		
Major Land Transport Infrastructure:	Local Roads		
Road Surface Condition:	68% of 44.1km of formed roads in FRA are sealed.		
Maritime / Waterways:	Pacific Ocean		
International:	None		

8. Predominantly rolling farmland, Cavalli's FRA also includes Department of Conservation (DoC) Land parcels including the offshore Motukawanui Island, accessed across the Cavalli Passage which is the final resting place of the Rainbow Warrior (now a major dive site accessed from charters in Matauri Bay, Whangaroa Harbour or the Bay of Islands). The island has a 12 bunk hut which can be booked through DOC, and is primarily a conservation island with a resident brown kiwi breeding population, as well as many other native bird species. The island is pest-free. There is also a large scenic reserve in the Tauranga Valley.

9. Dwellings are largely dispersed between two settlements of Matauri Bay and Te Ngaere, and around the coastline which is dotted with a number of holiday homes and isolated buildings. Marae are located at Wainui, Matauri Bay and Te Ngaere providing community focal points.

10. In the local economy Kauri Cliffs Luxury Lodge and Golf Course provides the major visitor drawcard, with a par 72 championship golf course and luxury accommodation attracting wealthy domestic and international visitors (including a visit by former US President Barack Obama). The only significant industry is the quarries run by Imery Ceramics, which provide various rock and aggregates for the local area.

11. Road access is generally good, with almost 70% of main roads sealed, while side roads serving farms and access to beaches are generally unsealed. There are no formal airports or airstrips, however helicopters landing is common at Kauri Cliffs. Offshore islands are only accessible by boat or helicopter.

Cavalli Volunteer Fire Brigade

12. Cavalli VFB does not have a dedicated fire station building and are currently utilizing shipping containers as training and equipment rooms. The single Pump appliance is temporarily housed in a farm shed further down the road. This temporary set up with minimal facilities fails to provide a safe, secure and appropriate environment for FENZ volunteers to operate in and to house emergency response equipment. Accordingly, the temporary nature of the facilities accommodating Cavalli Fire Station do not meet the specific requirements outlined in the Fire Station Design Manual and associated Guides, nor provide for the requirements of Importance Level 4 (IL4) under the Building Code Clause A3 Building Importance Levels. Cavalli falls under the category IL4 which includes "Fire, rescue, and police stations and emergency vehicle garages" such that they are "Buildings that are essential to post-disaster recovery or associated with hazardous facilities".

13. Cavalli VFB hosts one appliance.
CAVA4871: a 1988 Mercedes 917,
Rego DAA623.



CAVA4871 (Rural Pump)

14. The VFB current personnel numbers are 13:

- 1 x Rural Controller
- 1 x Deputy Rural Controller
- 1 x Rural Crew Leader
- 5 x Rural Firefighters
- 4 x Recruit Rural Firefighters
- 1x Brigade Support

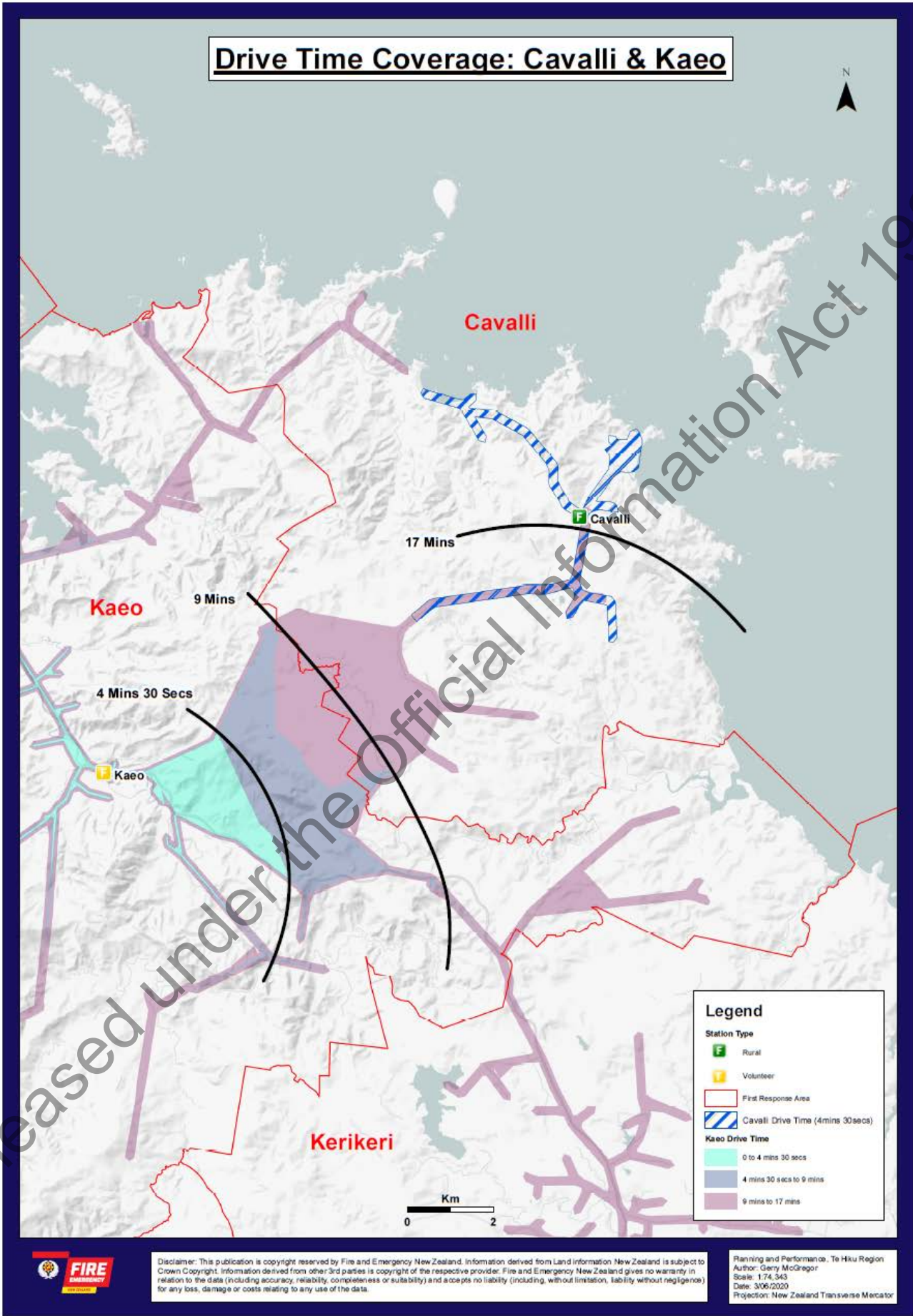
15. Cavalli VFB are trained primarily in rural wildfire response and Medical Co-Response (MED).

16. Comcen turnout data shows that: CAVA4871 is listed as a Rural Pump on 36 Beatlists (ranging from Rawhiti and the Bay of Islands to Doubtless Bay in the north). Fitted with lights, siren, radio and utilizing CAVA4871 Pager Group for turnout.

17. The semi-isolation of Cavalli is exemplified by the drive time response from neighbouring stations as shown in the following table and map (Source: ArcGIS analysis):

Responding Station to Cavalli Station	Time (Emergency Response Speed)	Notes:
Kaeo VFB	18 mins	Times are drive time only and don't include station turnout (K1) times.
Kerikeri VFB	26 mins	
Taupo Bay VRFF	38 mins	
Hihi VFB	40 mins	Times have been rounded to nearest minute.
Mangonui VFB	40 mins	
Paihia VFB	41 mins	

Drive Time Coverage: Cavalli & Kaeo



Map of Cavalli VFB indicative FRA showing relationship with Kaeo VFB drive time response.

18. Incident rate analysis of the Cavalli FRA is best undertaken by comparing two different methods:

- a. Location based analysis looking at the number/type of incidents that occur within the geographic location so that the underlying risk profile can be determined. This uses ICAD incident data as its primary source.
- b. Incident turnout analysis looking at which station/appliance responded. This gives an indication as to the overall workload of the station. Incident responses can differ considerably from location incident analysis as responses are set by Pre-Determined Attendance response plans for each given incident type.

19. Geographic analysis tabulated below shows Cavalli FRA has on average 18.7 incidents per annum with the majority being Medical Events (4.3) at 23.2% of all incidents, followed by Other Fires (4.0) at 21.4%, Vegetation Fires (3.0) at 16.1% and Motor Vehicle Accidents (2.7) at 14.3%.

20. If other incidents were attended to without reference to the Comcen then those incidents will not be included in this profiling analysis. It is noteworthy that the closest St John Ambulance Station is at Kerikeri, some 27 mins drive-time away with the next closest being considerably further afield at Coopers Beach.

Incident Type Group	2017/18	2018/19	2019/20	Annual Average	% of Incidents
Medical	7	3	3	4.3	23.2%
Other Fire	3	6	3	4.0	21.4%
Vegetation Fire	3	2	4	3.0	16.1%
Vehicle Accident	2	3	3	2.7	14.3%
False Alarm	3	2	2	2.3	12.5%
Special Service Calls	1	2		1.0	5.4%
Structure Fire	1		1	0.7	3.6%
Assist Public	1	1		0.7	3.6%
Grand Total	21	19	16	18.7	100%

Incidents occurring within Cavalli FRA per year (regardless of who attended)

21. Incident turnout analysis looking at the number/type of incidents that Cavalli VFB actually responded to is tabulated below. This gives an indication as to the overall workload of the station. On average Cavalli VFB is alerted to 19.3 incidents per annum from which they respond to an average of 16.3 incidents per annum. Of those, they don't arrive at an average of 3.3 incidents per annum due to first arriving appliance standing them down.

22. Of note: of the average 18.7 incidents per annum occurring within Cavalli FRA, they only attend 48% of those incidents.

Financial Year	Incidents Cavalli Alerted to	Incidents Cavalli Responded to within FRA	Incidents Cavalli Responded to outside FRA	Cavalli Non Response Incidents
2017/18	10	6	4	
2018/19	18	10	2	6
2019/20	30	11	16	3
Annual Average	19.3	9	7.3	3

Incidents Cavalli VFB were alerted to

23. Analysis of the time it takes Cavalli VFB to respond after being alerted shows that it takes has a median K1 turnout time of 13mins 04secs. This is noteworthy as the Comcen will turnout the next Pump Appliance at Kaeo from 5mins. Furthermore, Cavalli VFB have a median K2 incident arrival time within the Cavalli FRA of 27mins 09 secs. In comparison, when other stations respond into Cavalli FRA, their median K2 arrival time from incident start are (time includes any delay between incident start and subsequently this other station being turned out):

- Kaeo: 32mins 11 secs (3yr Median)
- Kerikeri: 40mins 31 secs (3yr Median)

Financial Year	Average K1 Turnout Time	Median K1 Turnout Time	Average K2 Arrival Time	Median K2 Arrival Time	Average K2 Arrival Time within FRA	Median K2 Arrival Time within FRA
2017/18	00:12:55	00:11:13	00:49:47	00:34:14	00:38:35	00:29:00
2018/19	00:20:37	00:21:41	00:36:07	00:33:07	00:32:04	00:33:04
2019/20	00:12:47	00:11:52	00:43:58	00:37:23	00:32:12	00:23:39
3yr Annual Avg /Median	00:14:44	00:13:04	00:42:27	00:33:10	00:33:22	00:27:09

Cavalli Volunteer Fire Brigade Response Times

24. For incidents Cavalli VFB was alerted to: turnout/arrival times are tabulated above as follows:

- Average K1 Turnout Time: Station Alert to K1 for Cavalli VFB to all incidents.
- Median K1 Turnout Time: Station Alert to K1 for Cavalli VFB to all incidents.
- Average K2 Incident Arrival Time: Incident Start to Cavalli VFB arrival at all incidents.
- Median K2 Incident Arrival Time: Incident Start to Cavalli VFB arrival at all incidents.
- Average K2 Incident Arrival Time within FRA: Incident Start to Cavalli VFB arrival to just those incidents within Cavalli FRA.
- Median K2 Incident Arrival Time within FRA: Incident Start to Cavalli VFB arrival to just those incidents within Cavalli FRA.

25. Analysis of Cavalli VFB arrival order at incidents they are responded to within Cavalli FRA highlight that they are the first arriving appliance 61.8% of the time. Kaeo or Kerikeri VFB arrive first the remainder of the time to incidents in Cavalli FRA (depending on incident location) resulting in Cavalli being stood down prior to arrival 2.9% of the time. Cavalli don't respond to 20.6% of incidents they are alerted to within their own FRA.

26. Analysis of Cavalli VFB arrival order at all incidents they are responded to regardless of location highlight that they are the first arriving appliance 37.9% of the time. Stood down prior to arrival 17.2% of the time and don't respond to 15.5% of all incidents they are alerted.

Cavalli VFB Arrival Order	2017/18	2018/19	2019/20	Annual Average
1	5	8	8	61.8%
2		1	1	5.9%
3		1	1	5.9%
4			1	2.9%
Did not arrive at incident	1			2.9%
Did not respond	0	6	1	20.6%

Arrival order to Incidents within Cavalli FRA that Cavalli VFB were alerted to

Cavalli VFB Arrival Order	2017/18	2018/19	2019/20	Annual Average
1	5	8	9	37.9%
2		1	4	8.6%
3		1	1	3.4%
4			3	5.2%
5+	1	1	5	12.1%
Did not arrive at incident	4	1	5	17.2%
Did not respond	0	6	3	15.5%

Arrival order to all Incidents that Cavalli VFB were alerted to

Locality Capability Summary

27. Cavalli VFB is located on the east coast of Northland, characterized by rolling farmland, steep highly vegetative terrain, offshore conservation islands and limited access to coastal communities which line the coast. Accordingly, Cavalli needs a high degree of resilience and capability to respond to local emergency incidents. In reviewing the potential capability levels that could be applied to Cavalli VFB, attention is drawn to the NRRM – Resource Matrix attached at Enclosure 1.

- Structure Fire: Level 1 (external Defensive Operations)
- Misc Fire: Level 1 (Extinguish small fire including mobile property fire)
- Vegetation Fire: Level 2 (Able to size up, contain and extinguish vegetation fire, wildfire and contribute to larger fire force).
- Hazardous Material spill/leak: No Response: (not trained in HAZSUBs therefore unable to determine safe distance to cordon).
- Medical: Level 2 (Med Co-Response).
- Natural Disasters/Rescue/Special Services/Incident Management/CIMS: Level 0.

28. Averaging less than one Structure Fire per annum, it does not justify the level of commitment/training/investment that would otherwise be required for Cavalli VFB to develop a full Breathing Apparatus internal offensive capability.

29. Kaeo VFB is 18 mins drive-time away and provides a specialist urban-oriented capability. Kerikeri Pump Rescue Tender for Motor Vehicle Accidents and St John Ambulance are further again at 26 mins drive time.

30. Noting the majority of calls Cavalli VFB respond to are Medical, Other Fires and Vegetation Fires, the logical FENZ capability for the locality is the ability to respond quickly to render medical aid or quickly extinguish any emerging fires whilst they are small and able to be contained; thence await additional assistance from other responding units. Given that Cavalli VFB current median K1 response turnout times are 13mins (which results in neighbouring Kaeo VFB also being turned out after 5mins) and Cavalli VFB subsequently have a median K2 arrival time of 27mins from incident start, then significant effort needs to be made to reduce those times otherwise the cost of maintaining a FENZ presence within the locality is counteracted by Kaeo VFB who currently attend incidents within Cavalli FRA within a median K2 arrival of 32mins (if Kaeo were made primary responder then their median response time would reduce to 27mins matching Cavalli VFB's current service delivery).

31. When considering appliance resourcing, attention is drawn to diversity of terrain and accessibility challenges beyond the formed roads. Four-wheel drive vehicles should feature highly in any considerations for resourcing.

32. The current station facilities are two shipping containers, and are not fit for purpose to safely and securely house Fire and Emergency vehicles and equipment, nor are they a safe and sanitary environment for Fire and Emergency volunteers to operate in.

Supplementary Information

33. This report has been researched and compiled by the Te Hiku Region Planning and Performance Team. Contact for discussion (if required):

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Enclosure:

1. National Risk Resource Model – Resource Matrix
2. Map: Matauri Bay
3. Map: Cavalli FRA Incidents

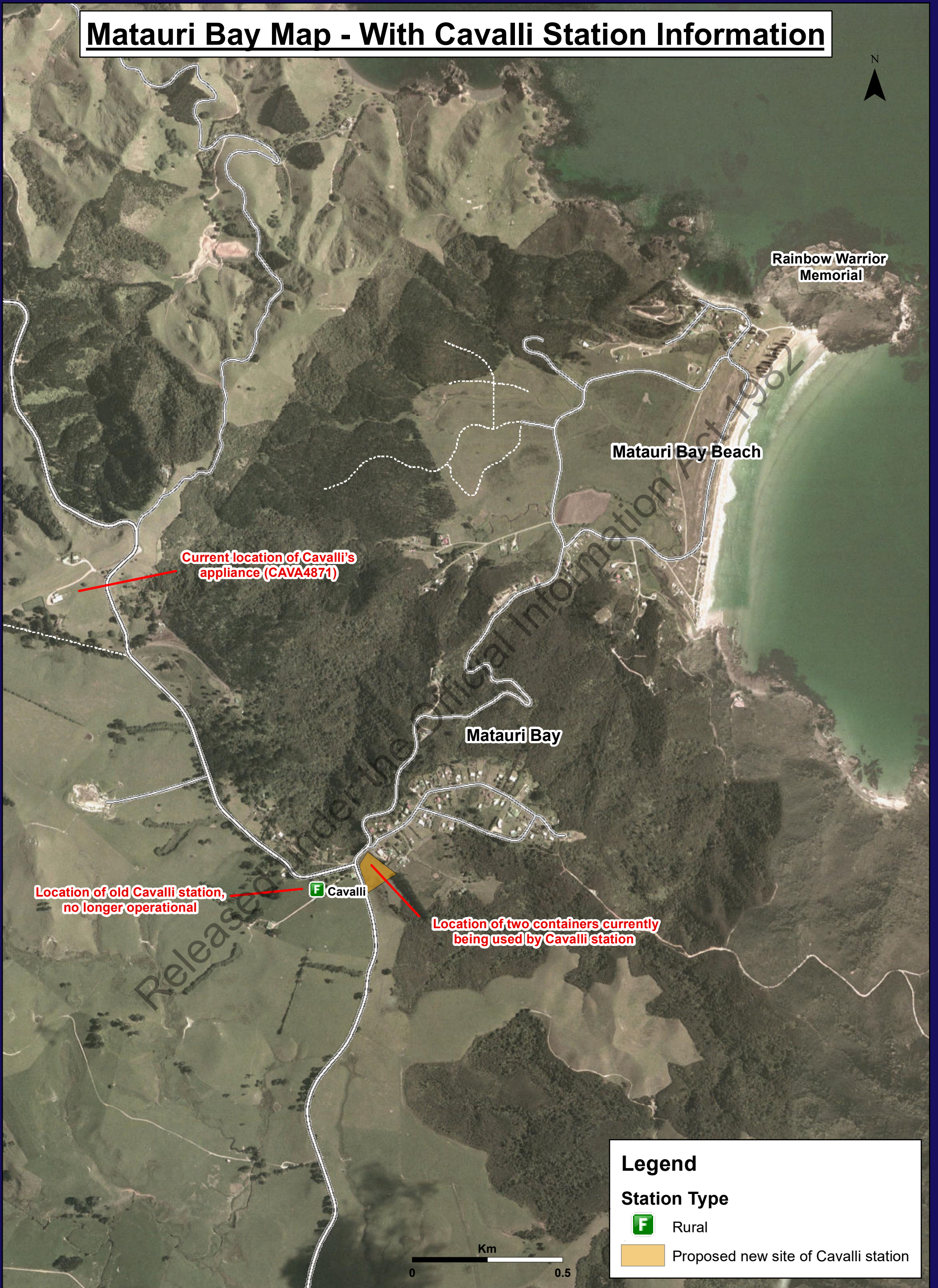
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National Risk Resource Model - Resource Matrix

Level of Capability	Emergency Category										
	Structure Fire	Miscellaneous Fires	Vegetation Fire	Hazardous Material Spill/Leak	Motor Vehicle Accident	Medical	Natural Disasters	Rescue (including line and swift water)	Special Services	Incident Management	Coordinated Incident Management System (CIMS)
6 Enhanced Capability for Specific Risks	 Specials: hose layer, BA tender, aerial, command vehicle	 Specials, training for ship fire and large aircraft fire	 Refer to rural Strategical Fire Management Plans	 Decontamination corridor	 Heavy rescue	 USAR support to NZ Medical Assistance Team (NZMAT). Crewman training for medical rescue helicopter.	 Urban Search and Rescue (USAR) team (light/medium/heavy)	 USAR (including trench collapse)	 Special Services	 Incident Management	 Coordinated Incident Management System (CIMS)
5											
4				Stage 3 decontamination.				Line Rescue Level 4 (instructor)		National Coordination Center (NCC)	
3	Frequent internal offensive operations.			Stage 2 decontamination, including gas.	All but heavy rescue (including persons trapped) and deal with any fire from accident.	First response.		Line Rescue Level 3 (rescue and recovery)		Regional Coordination Center (RCC)	National Crisis Management Centre (NCMC)
2	Internal offensive operations.		Able to size up, contain, and extinguish vegetation fire / wildfire, and contribute to larger fire force.	Stage 2 decontamination.	Rescue persons trapped and deal with any fire from accident.	Co-response.		Line Rescue Level 2 (access and stabilisation)		Local Coordination Center (LCC)	Emergency Coordination Centre (ECC)
1	External defensive operations.	Extinguish small fire, including mobile property fire.	Able to extinguish small vegetation fires generally found in urban areas and rural/urban interface.	Personal hygiene	Pump support, patient access and care, and deal with any fire from accident.	First aid trained only.	Rapid assessment and heavy clearance.	Safe working at heights		Hazmat Command Vehicle	Emergency Operations Center (EOC).
0 Basic Capability	Cordon management only	Cordon management only	Cordon management only	Cordon management only	Provide physical assistance to NZ Police or ambulance staff or higher-capability brigade	Non-medical assist. Provide physical assistance to ambulance staff or higher-capability brigade	Provide physical assistance to Civil Defence or higher-capability brigade	Cordon management only	Provide physical assistance to public / lead agency	Incident Command	Incident Control Point (ICP)
No Response	No response capability to incidents in this emergency category	No response capability to incidents in this emergency category	No response capability to incidents in this emergency category	No response capability to incidents in this emergency category	No response capability to incidents in this emergency category	No response capability to incidents in this emergency category	No response capability to incidents in this emergency category	No response capability to incidents in this emergency category	No response capability to incidents in this emergency category	No response capability to incidents in this emergency category	No response capability to incidents in this emergency category

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Matauri Bay Map - With Cavalli Station Information



Legend

Station Type

Rural

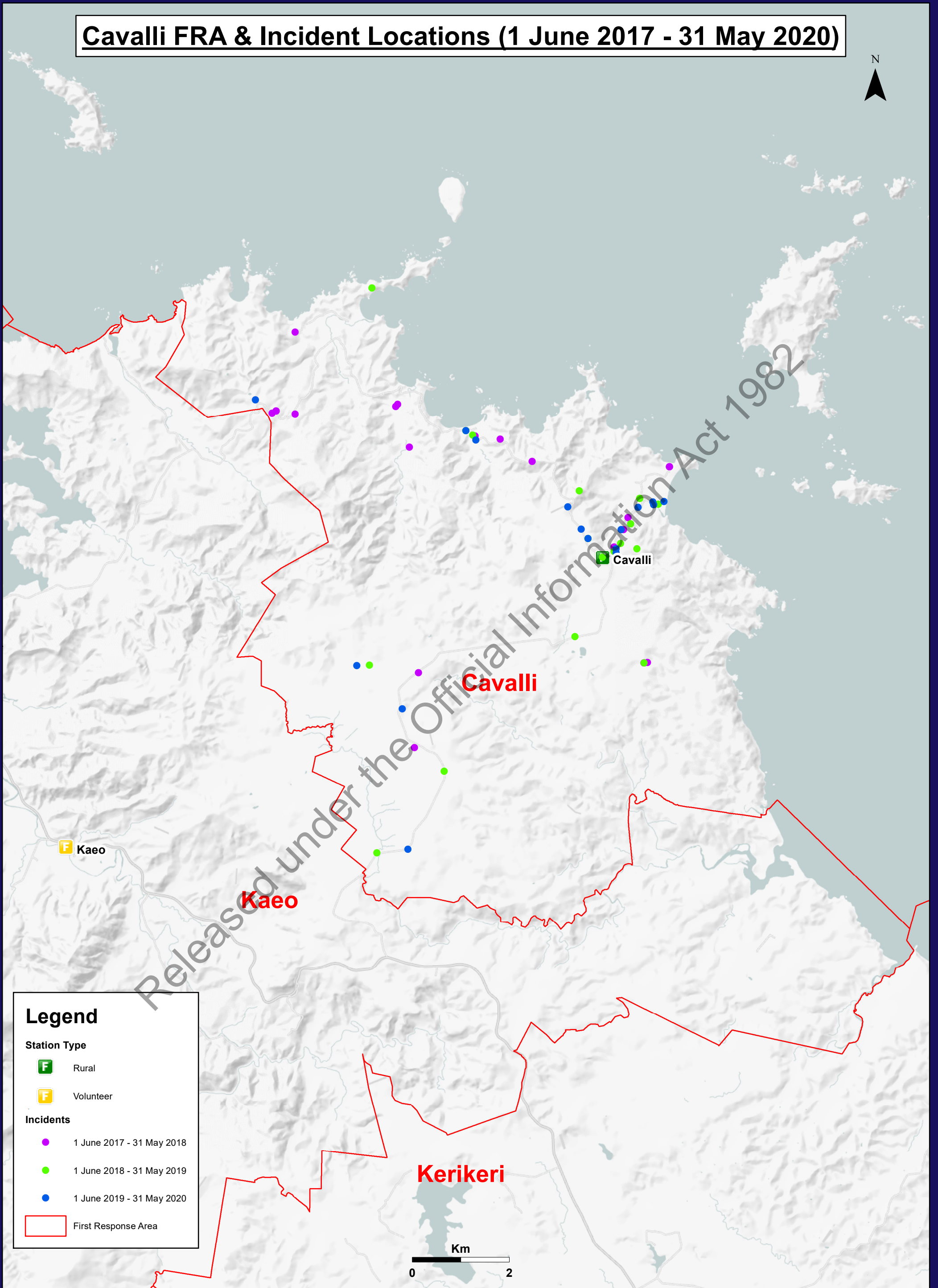
Proposed new site of Cavalli station



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Planning and Performance, Te Hiku Region
Author: Gerry McGregor
Scale: 1:11,196
Date: 3/06/2020
Projection: New Zealand Transverse Mercator

Cavalli FRA & Incident Locations (1 June 2017 - 31 May 2020)



Legend

Station Type

- Rural
- Volunteer

Incidents

- 1 June 2017 - 31 May 2018
- 1 June 2018 - 31 May 2019
- 1 June 2019 - 31 May 2020

First Response Area



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