Field Work Risk Assessment: Is it safe to work on the Volcano?

Volcano Name:

Volcanic Alert Level (Circle one)
0 1 2 3 4 5
Status:

☐ Dormant/Quiescent ☐ Unrest ☐ Eruptive

Number of staff: ☐ **Emergency** Equipment Malfunction?
Time needed on Volcano:

Location of work:

☐ Near vent (within 1km) ☐ Proximal (within 1-3 km of vent)

☐ Distal (outside of 3km)

Brief Description and Purpose of Proposed Field Excursion:

Checklist:

☐ Staff is aware of hazards on volcanoes, and the recommended actions to avoid injury and death

☐ Staff has read the associated section on risks based on volcanic activity (eruptive versus non-eruptive)

☐ Staff is aware of the possibility of 'Blue-sky' eruptions, and major risks within 3 km of the vent.

Probability of an Eruption occurring which staff are on the volcano?

Low

Medium

High

☐ **I acknowledge that working on volcanoes is dangerous, and that all health and safety regulations have been considered.**

Field Manager Name: **Signature:**

☐ **I approve this field excursion** **Date:**

Section Manager Name: **Signature:**

Volcano is Quiescent, Risk of 'Blue-Sky' Event:

Table 1. Return periods for potentially life threatening eruptions with no recognised precursory activity at New Zealand's frequently active volcanoes. Note: these numbers are the best available at the time of writing. With more detailed research, the risk will be better defined.

	Number of years	Maximum and minimum number of life-threatening eruptions with no precursory activity[1]	Maximum and minimum number of life –threatening eruptions **per year** with no precursory activity
White Island	50	2-3	0.04-0.06
Ngauruhoe	50	0	0
Ruapehu	50	3-7	0.06-0.14
Tongariro	153	0	0
Raoul Island	200	0-1	0.005

[1] The definition of unrest will be different for each volcano.

[1] Ngauruhoe appears to mostly have precursory activity before eruptions, usually vigorous steaming from the crater and fumaroles. The record of eruptions at Tongariro is not good enough to make a judgment on whether there was precursory activity. Given that the time since the last eruption is long, one would probably expect there to be significant unrest before an eruption.

Volcano is Showing 'Unrest', or is 'Eruptive' → Risk of Future Event:

Using global statistics (Newhall and Hoblitt, 2002), once a period of significant unrest is initiated, the likelihood of an eruption within one year is between 10 and 50%. If there is any doubt, then fieldwork within 3 km of the vent should be suspended for at least 24 hours. Following an initial eruption, the probability of further eruptions could be higher or lower, depending on the volcano, the style of the eruption and the magnitude of the eruption.

Things to consider:

Make the risk assessment on the day of your fieldwork. Consider –where you are going, how long you need to be there, and what parts of the volcano are 'safer' than others. **If there has been an eruption (phreatic and/or magmatic) realistically no vent-work will be allowed for weeks.** If this is the case, look at Distal field work or airborne fieldwork. If equipment needs mending, a fly-by-pick-up is recommended.

(Russell and Newcombe, 2000)

LEVEL OF RISK			TYPE OF ACTIVITY/EXPOSURE				
SDU	Numerical	Categorical	Drug use	Leisure activity	Disease/illness	Accident/injury	Other exposures
0	1 in 1	*Maximum*					Intensive care
1	1 in 10	*Extremely high*		Russian roulette*			Brain surgery
2	1 in 100	*Very high*	Tobacco	BASE jumping	Heart disease		Surgical operation
			Methadone	Serious climbing ~	Cancer		Space travel
			Injecting	Grand Prix racing	Respiratory disease		Deep sea fishing
3	1 in 1,000	*Quite high*	Heroin	Hang gliding	Hypothermia etc.	Violence	Hospitals- babies
			Morphine	Parachuting	Mental disorders	Pollution	White asbestos
			Barbiturates	Motorbike racing	Strokes	Sudden infant death	Offshore oil work
			Alcohol	Recreat. climbing~	Prostate c. (men)	Shaking of babies	Mining
4	1 in 10,000	*Medium*	Solvents	Motor sports	Diabetes	Suicide; Falls	Construction work
			Benzodiazepines	Water sports ***	Leukaemia	Road travel/use	Farming/agriculture.
			Dextropropoxy.	Mountain hiking ~	Influenza	Giving birth	Police custody
			Dihydrocodeine	Canoeing	Skin cancer	Helicopter travel	GA-dentist; liposuct.
5	1 in 100,000	*Quite low*	Ecstasy/MDMA	Dance parties	Asthma	Air & rail travel	Factory/machine work
			Amphetamine	Fighting sports	HIV/AIDS	Homicide;	C.A.Refusal of int.care
			Cocaine; GHB	Snow sports	Meningitis	Stairs (falling)	Manufacturing (cars etc) #
			Prescribed drugs	Soccer & rugby	Sudden death syn.	Eating (choking)	Passive smoking
			Analgesics	DIY (home)	Food poisoning	Electrocution; Guns	X-rays; Machines
			Contracep. pill	Sport spectator	Cervical cancer	Drowning; Fire	Work (general)
6	1 in 1 million	*Very low*	LSD (*acid*)	Fairground rides	Legionnaire's	Beds (falling out)	Clerical/office work
			Hal.mushrooms	Running/jogging	Food allergies	Clothing fires; Toys	Vaccination; Abortion
			Antibiotics	Swimming	Malaria; Syphilis	Boilers/heaters !	Police cars; Storms
			Viagra (men)	Riding sports	Appendicitis	Pedest. crossings	War/terrorism
7	1 in 10 million	*Extremely low*	Herbal cannabis	Indoor sports	CJD/BSE; Measles	Insect stings	Nuclear radiation
			Cannabis resin	Playgrounds	Toxic shock synd.	Dogs; Copulation	Police shootings
			Alkyl nitrites	Gymnasiums	Peanut allergy	Starvation; Thirst	Lightening
8	1 in 100million	*Minimum (negligible)*	Caffeine; Khat	Table games	Bubonic plague	Snakes; Birds; Cats	State executions
			Nitrous oxide	Computer games	Smallpox	Sharks;Telephones	Meteorites;Volcanoes
			Ketamine; DMT	Masturbation	Leprosy	UFOs/aliens	Earthquakes;sp.comb.