

TABLE 1: RISK ASSESSMENT FOR HAZARDS IN THE MOVIE THIRTEEN LIVES

What hazards?	Who might be harmed and how?	Risk Rating: Likelihood, Severity	Actions to reduce risk ALARP	Person responsible for action	Due by date	Signed off as done on date
Psychosocial Hazards						
Remote work or isolation hazard	<ul style="list-style-type: none">Underwater DiversNavy Seals <p>Working in isolation or remotely can adversely impact a worker's mental and physical health. Symptoms of anxiety, self-doubt and difficulty focusing on task execution can hinder completion of assignments. The nature of this work introduces risks such as lack of immediate support in emergencies, increased accidents, limited access to resources and inability to communicate which may adversely affect the organization.</p>	Likelihood (5) x Severity (5) = 25 (CRITICAL)	<ul style="list-style-type: none">Develop coping techniquesConsultations with managementProvide proper equipment and resourcesConduct comprehensive trainingContinuous risk assessments	Individuals(Divers/Navy Seals) Individuals(Divers/Navy Seals) Governor Naval Commander Naval Commander	29 th July 2022	

Stress hazard	<ul style="list-style-type: none">• Governor• Parents <p>Prolonged occupational stress can adversely affect physical and cognitive well-being leading to high blood pressure, poor digestion, increased risk of heart disease, anxiety and depression.</p>	Likelihood (4) x Severity (3) = 12 (HIGH)	<ul style="list-style-type: none">• Develop stress-management techniques• Prioritize personal wellness• Foster supportive cultures• Delegate and distribute workloads evenly	Individuals(Parents/Governor) Individuals(Parents/Governor) Minister of Interior (Governor’s Supervisor) Minister of Interior (Governor’s Supervisor)	29 th July 2022	
High workload hazard	<ul style="list-style-type: none">• Volunteers• Military officers• Journalists• Emergency Medical Personnel <p>High workload is common due to disproportionate organizational demands and resource constraints. Organizations set ambitious and unrealistic expectations with tight deadlines. This places excessive demands on employees especially which can intensify pressure, forcing employees to work longer hours and experience physical health concerns, team conflict, anxiety and burnout.</p>	Likelihood (3) x Severity (3) = 9 (HIGH)	<ul style="list-style-type: none">• Improve resource planning and workload distribution• Set realistic deadlines and expectations• Provide support and flexibility• Foster open dialogue and communication	Governor/ Military Commander/Supervisor Governor/ Military Commander/Supervisor Governor/ Military Commander/Supervisor Governor/ Military Commander/Supervisor	29 th July 2022	
Biological Hazards						
Starvation hazard	<ul style="list-style-type: none">• 12 boys• Coach <p>Estimates indicate that starving people become weak in 30 to 50 days and die in 43 to 70 days. Individual factors including sex, age, starting weight, and water intake all play a role in how long someone can live without food. The body works to fight starvation by producing glucose and breaking down fatty tissue.</p>	Likelihood (5) x Severity (3) = 15 (HIGH)	<ul style="list-style-type: none">• Avoid Risk Altogether.• Reduce motion to conserve energy.	Individual	29 th July 2022	

Contaminated/ unsanitary conditions hazard	<ul style="list-style-type: none">• 12 boys• Coach <p>Tap water that is contaminated with germs or chemicals can make you sick. Tap water can get contaminated by human or animal poop, natural or man-made chemicals, or other sources. If your tap water is contaminated, do not drink it.</p>	Likelihood (5) x Severity (3) = 15 (HIGH)	<ul style="list-style-type: none">• Dig a hole and use as a disposable toilet• Knowledge to not use contaminated water.	Coach 12 Boys	29th July 2022	
Drug use hazard	<ul style="list-style-type: none">• 12 boys• Coach <p>Mixing any combination of prescription drugs, over-the-counter drugs, illicit drugs and alcohol can be unpredictable and dangerous. Most fatal overdoses involve use of more than one type of drug (poly-drug use). Poly-drug use is dangerous because different drugs act on our bodies in different ways.</p>	Likelihood (5) x Severity (5) = 25 (CRITICAL)	<ul style="list-style-type: none">• Avoid by all means	Rick Stanton, John Volanthen, Governor	29th July 2022	
Ergonomic Hazards						
Prolonged Postures and Repetitive Movement Hazard	<ul style="list-style-type: none">• Children• Divers• Rescue workers <p>Maintaining the same posture for extended periods and performing repetitive movements, such as swimming and digging, posed significant hazards. The divers spent countless hours underwater, resulting in physical strain and fatigue. The rescue workers engaged in digging and sandbagging efforts, which caused back, arm, and leg pain as well as exhaustion</p>	Likelihood (5) x Severity (3) = 15 (HIGH)	<ul style="list-style-type: none">• Scheduled rest breaks• Use of more ergonomic tools and aids• Preparation and recover stretching	Individuals (Divers/Navy Seals)/ Commander/Supervisor	29th July 2022	

Exposure to Cold and Damp Conditions Hazard	<ul style="list-style-type: none">• Divers• Navy Seals• Children <p>Remaining in waterlogged, cold environments led to stiff muscles and reduced flexibility. The children, sitting and lying in damp areas for days, experienced discomfort and were at risk of cramping. Prolonged immersion in cold water exacerbated muscle strain and fatigue for the divers.</p>	Likelihood (4) x Severity (4) = 16 (CRITICAL)	<ul style="list-style-type: none">• Equip workers with thermally insulated wetsuits• Create a warming station• Train workers to recognise symptoms of cold stress	<ul style="list-style-type: none">• Commander/Supervisor• Governor• Commander/Supervisor	29th July 2022	
Transportation of Sedated Children Hazard	<ul style="list-style-type: none">• Divers• Children <p>Carrying unconscious children while swimming through hazardous cave routes required precise control and added extreme physical burden. The divers had to manage the weight of the children alongside their diving equipment while navigating strong currents. This increased strain, posed a risk of injury to both the rescuers and the children, and heightened the possibility of fatalities.</p>	Likelihood (3) x Severity (5) = 15 (HIGH)	<ul style="list-style-type: none">• Train divers on proper ergonomic lifting and carrying techniques• Use specialised carrying devices, such as buoyancy aids or harnesses, designed for rescue operations.	<ul style="list-style-type: none">• Commander/Supervisor• Individuals (Divers/Navy Seals)/ Commander/Supervisor	29th July 2022	
Physical Hazards						
Confined Space Hazards	<p>Rescuers: The risk of becoming trapped, disoriented, or suffocating is high for the divers working in confined spaces.</p> <p>Trapped Boys: The boys themselves are exposed to the same risks, as they are confined in the cave for over two weeks.</p>	<p>Likelihood (L): 4</p> <p>Severity (S): 4</p> <p>Likelihood (3) x Severity (5) = 16 (Critical)</p>	<p>Pre-entry assessment of cave conditions to identify the narrowest and most dangerous areas.</p> <p>Use of helmets and personal protective equipment (PPE) to minimize injury from impacts.</p>	<p>Divers</p> <p>Divers/Individuals</p>	29 th July 2022	

			Back-up rescue personnel stationed near entry/exit points in case of emergencies.	Government/Military		
Flooding and Drowning Risks	<p>Rescuers: Divers face the threat of being caught in currents or trapped underwater.</p> <p>Trapped Boys: The boys are initially trapped by flooding, which threatens their ability to breathe and survive.</p>	<p>Likelihood (L): 5</p> <p>Severity (S): 5</p> <p>Likelihood (3) x Severity (5) = 25 (Critical)</p>	<p>Use of life-saving equipment, such as buoyancy aids, personal flotation devices, and diving suits.</p> <p>Deployment of experienced divers who are specifically trained in water navigation in strong currents.</p> <p>Clear escape plans in place for rapid exit if water levels rise unexpectedly.</p> <p>Backup dive teams to prevent overworking any individual diver and ensure safe rotation.</p>	<p>Divers</p> <p>Government</p> <p>Divers</p> <p>Government/Rescue Team</p>	29 th July 2022	
Oxygen Deprivation	<p>Rescuers: The divers rely on oxygen tanks, and without adequate monitoring, they could face oxygen deprivation or suffocation.</p> <p>Trapped Boys: The boys face the danger of suffocation as the oxygen levels fall within the cave.</p>	<p>Likelihood (L): 4</p> <p>Severity (S): 4</p> <p>Likelihood (3) x Severity (5) = 16 (Critical)</p>	<p>Continuous monitoring of oxygen levels throughout the cave system using sensors.</p> <p>Portable oxygen tanks for all rescuers and the trapped boys, if possible, to ensure an adequate air supply.</p>	<p>Divers/Rescue Team</p> <p>Divers</p>	29 th July 2022	