Terracon Monthly SAFETY Topic

Ref# 004-2022 **Heat Illness**

In 2021, the National Weather Service reported a 'perfect storm' for the combination of heat and humidity that increased heat illness potential. There were also areas of the country (like the Pacific Northwest) exposed to much higher temperatures than normal. 2022 is shaping up to be just as hot.

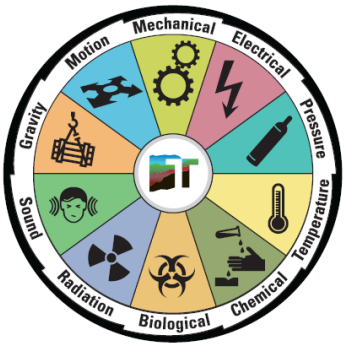
This Safety Topic will give you all the information needed to be proactive in preventing heat illness injuries.

What is Heat Illness?

Heat is a serious hazard. Your body builds up heat when you work, then sweats to get rid of extra heat. If your body does not cool off fast enough you develop a heat illness.

Too much heat can make you tired, hurt your job performance, and increase your chance of injury.

- *Dehydration* - occurs when your body loses water, and you can't cool off fast enough. You feel thirsty and weak. Urine color is dark.
- *Cramps* – spasms and pain happen from reduced electrolytes and can occur long after you leave work.
- *Heat Rash* – bumps or blisters that are itchy or sting. Not dangerous but a warning that you may be overheating.
- *Heat exhaustion* – cramps, tired, nauseous, headache, dizzy, and confused. Your skin is damp and looks muddy or flushed and you have a high temperature. You may faint. This is your body's warning that heat stroke is not far off.
- *Heat stroke* – comes when you have hot dry skin, a high temperature, high heart rate, and you have stopped sweating. You may feel confused, have convulsions, vomit, or become unconscious. Heat stroke can **kill you** unless emergency medical help is received.



Energy Present?

If a Co-Worker Experiences Heat Illness

- ⊕ *Stop Work and cool off* at the first signs of heat illness. Contact your supervisor.
- ⊕ *Perform Less Strenuous Work the Following Day* – heat exposure builds up over time. If you feel the effects of heat illness today, you are more susceptible to it tomorrow.
- ⊕ *If a coworker passes out or you think they have heat stroke call 9-1-1* – Immediately move the victim to the shade or a cooler area. Loosen their clothes. Wet their skin with cool water (not ice-cold water) and use a piece of cardboard to fan them. Provide fluids if they are conscious.

Terracon Monthly SAFETY Topic

Pre-Task Plan and Evaluate the Risk

Your exposure to heat illness depends on heat and humidity. Calculate the heat index by crossing temperature with humidity to evaluate risk and pre-task plan for heat illness prevention. **It is important to note this chart is calculated for light wind and temperatures in the shade! Add 15° to the temperature if you are working in direct sun.**

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution | Extreme Caution | Danger | Extreme Danger

- Almost every task performed by archaeologists outdoors may cause heat illness. Think about the task you are performing and evaluate your risk. *Observing* excavation operations is a lot less strenuous than *performing* excavation operations.
  - How fast you must move? How much weight must you lift?
  - Will you be directly in the sun? Can shade be provided? Can misters or blowers help keep you cool?
  - If you work in protective clothing like chemical coveralls or respirators, you need more rest breaks. You may also need to monitor temperature and heart rate.
  - Physical activity including but not limited to hand augering, DCP use, digging by hand, density testing, concrete sampling, strenuous lifting and carrying, are **HIGH RISK** for heat illness.
- If possible, adjust the work schedule to do the heaviest work in the coolest time of the day.
- If heavy work in hot areas is necessary, take turns with other workers, so some can rest. A task that normally takes one person will take two in DANGER or EXTREME DANGER conditions.

Download a heat stress app to help you pre-task plan. The OSHA - NIOSH Heat Index App is a good one. It includes local weather conditions / heat index, hourly risk evaluator with notification alarm, symptom list, and first aid directions in English and Spanish. It has e*verything* you need to know to prevent heat illness.

Terracon Monthly SAFETY Topic

Heat Index	Risk	Precautions
80 ° - 90° F Fatigue risk with prolonged physical activity	**CAUTION**	Acclimate Hydration and Nutrition – drink when thirsty, eat a balanced diet Supervisors - begin planning for higher temperatures
		For work in direct sun or work in protective clothing, use **Extreme Caution** section below.
91 ° – 103° F heat stroke, cramps, exhaustion possible with prolonged physical activity	**EXTREME CAUTION**	Hydration and Nutrition – 32oz / hour Eat snacks periodically to replenish salt and electrolytes. **Never exceed** more than 48oz / hour or 32, 12oz bottles of water / day.
		Schedule cooling breaks and stick to the schedule. At least a 15-minute break every 45 minutes.
		Monitor one another for signs of heat illness.
		Implement cooling techniques like misters, fans, shade structures, cool bands.
		Supervisors – review heat illness topics and send reminders to your team. Contact staff in chemical protective clothing and establish a detailed monitoring plan.
		For work in direct sun or work in protective clothing, set up a buddy system, adjust schedule to lower heat index times, closely monitor workers.
104 ° – 115° F heat stroke possible, cramps, exhaustion likely with prolonged physical activity	**DANGER**	In addition to the above: Begin limiting physical exertion. Move slower, get help, strictly enforce hydration and rest breaks. At least a 15-minute break every 30 minutes.
		Supervisors – Add staff to extremely physical work activities. Begin planning for split shifts, adjusting work schedule, night work, adding staff for strenuous work.
		For work in protective clothing, set up a buddy system, adjust schedule to lower heat index times, closely monitor workers. Document physiological monitoring.
> 115 ° F heat stroke highly likely with prolonged physical activity	**EXTREME DANGER**	In addition to the above: Begin physiological monitoring (pulse, temperature).
		Stop Work if essential control methods are deemed inadequate.
		Supervisors – begin rescheduling extremely strenuous work. Notify workers of extreme danger and send reminders.
		Work in protective clothing or respirators will not take place in these conditions.

Terracon Monthly SAFETY Topic

What You Can (and Can't) Control

You can't control the weather. Our work puts us outdoors and exposes us to extreme weather conditions. Control the risk by;

- *Hydration* - Drinking at least 1 liter of water per hour. Avoid energy drinks and caffeinated beverages as these will dehydrate you. Also avoid sports drinks with a high sugar content. If you like, mix in one sports drink with every three waters. **Never exceed** more than 48oz / hour or 32, 12oz bottles of water / day. Continue to hydrate into the evening after work to prepare for the next day.
- *Diet* – a balanced diet is just as important as hydration. Don't skip breakfast and snack throughout the workday. Eat light, balanced foods with low salt and plenty of nutrients. Do not take salt or electrolyte tablets. A normal, balanced diet will provide electrolytes needed.
- *Personal Physical Condition* – your personal condition affects heat illness. If you are over 60 years old, overweight, or not used to exercise, you are at risk. If you have ever had heat illness before you are at risk. Taking medications or personal medical conditions can cause dehydration and increase the risk of heat illness.
- *Off Work Activities* – Do you like to go home and have a beer or a glass of wine? Alcohol absorbs water and causes dehydration. It can take 24 hours to re-hydrate after a few alcoholic beverages. If your work will put you in the heat, try to avoid alcohol. If you drink alcohol, HYDRATE!
- *Frequency of Breaks* - Take plenty of rest breaks. Rest in a cool, shady spot. Get in your truck to cool off. Use fans and/or misters. Work in the shade whenever possible. Use pop-up shade canopies.
- *Clothing and PPE* - Wear light-colored, cotton clothing. Utilize cooling bands and hard hat shades. Don't forget the sunscreen to reduce sunburn!
- *Acclimation* - If you are not used to working in the heat or for the first few weeks of the year when high temperatures begin, you need time for your body to acclimate. Be extra careful the first 2 weeks in the heat. Work slower, take breaks, and hydrate.
- *Physiological Monitoring (pulse and temperature)* – while every person is different, the average work HR should be limited to about 110 beats per minute (bpm) if an 8-hour work shift is to be completed. Stop work and rest if your heart rate exceeds 140 bpm. Temperature can be inaccurate based on method, fluid intake, and cooling devices. In general, stop work and rest of your temperature exceeds 100° F.

Urine Color	Possible Meaning
Clear	Good hydration, overhydration or mild dehydration
Pale Yellow	Good hydration or mild dehydration
Bright Yellow	Mild or moderate dehydration or taking vitamin supplements
Orange, Amber	Moderate or severe dehydration
Tea-Colored	Severe dehydration

- *Urine Color* - It is not pleasant, but your urine color and smell can alert you to dehydration. The darker and worse smell of your urine indicates your hydration level. For tea colored urine, seek immediate medical attention.