

Arizona Department of Health Services Heat Emergency Response Plan



May 2014

This page intentionally left blank

Table of Contents

I. Goals of Plan	1
II. Scope.....	1
III. Background.....	1
IV. Concept of Operations.....	4
V. Educational Campaign	7
VI. Recommendations for County Heat Emergency Response Plans.....	9
VII. Tribal Regional Behavioral Health Authority (TRBHA) and Regional Behavioral Health Authority (RBHA) Heat Emergency Response Plans	10
VIII. Plan Maintenance	10
IX. Appendices.....	11
APPENDIX A – PHIMS Organization Chart Template.....	12
APPENDIX B - Contact Information	13
APPENDIX C – Sample News Releases	14
APPENDIX D – CDC Frequently Asked Questions (FAQ) About Extreme Heat.....	20
APPENDIX E – STATE/COUNTY/TRIBAL PUBLIC HEALTH RESOURCES	25
APPENDIX F - HEAT RELATED ILLNESSES AND SAFETY	28
APPENDIX G – WET BULB.....	36
APPENDIX H – HEAT INDEX	38
APPENDIX I – OTHER RESOURCES	39
APPENDIX J – HEAT RESOURCE GUIDE.....	40

I. Goals of Plan

- Limit the adverse public health effects from excessive heat
- Identify conditions and/or events that would trigger activation of part of or the entire Heat Emergency Response Plan
- Provide a framework for coordinating the efforts of the Arizona Department of Health Services (ADHS) Divisions, counties, cities, tribes and other agencies that provide services to the homeless, seniors and medically-at-risk persons, to reduce the health risks associated with extreme hot weather
- Provide a list of prevention and educational resources that may mitigate heat-health adverse effects and/or deaths

II. Scope

The ADHS Bureau of Public Health Emergency Preparedness, Division of Behavioral Health Services, Office of Environmental Health and Division of Licensing, along with our county and tribal health partners are working together to establish a statewide Heat Emergency Response Plan to identify the roles and responsibilities of the state, county, city, tribes and other responsible agencies; and to establish a response upon the issuing of heat warnings. This plan serves as an incident annex to the ADHS Emergency Response Plan but does not take into account any power outages associated with an excessive heat wave (Please refer to the ADHS Power Outage plan). The Arizona Division of Emergency Management (ADEM) would respond if needed, according to the Basic Plan of the State Emergency Response and Recovery Plan (SERRP) http://www.dem.azdema.gov/preparedness/docs/Basic_Plan.pdf

This Heat Response Plan will focus on the following:

- Education to the public on the significance of an excessive heat watch and excessive heat warning
- Information of available resources for functional and access needs populations
- Protection to vulnerable segments of the population during periods of excessive heat warning.
- Appropriate interventions, as necessary

III. Background

The Center for Disease Control & Prevention (CDC) reports that approximately 400 people die each year from direct exposure to heat due to weather conditions and the National Weather Service says heat is the number one weather-related killer in the United States. The National Weather Service statistical data shows that heat causes more fatalities per year than floods, lightning, tornadoes and hurricanes combined. The elderly, the very young, and people with chronic health problems are most at risk.

However, even young and healthy individuals can succumb to heat if they participate in strenuous physical activities during hot weather. Additionally, some behaviors also put people at greater risk: drinking alcohol; taking part in strenuous outdoor physical activities in hot weather; and taking medications that impair the body's ability to regulate its temperature or that inhibit perspiration.

Between 2000 and 2012, 1535 deaths from exposure to excessive natural heat occurred in Arizona, in Phoenix, Arizona, normal daily maximum temperature reaches $\geq 100^{\circ}$ F in early June and can remain at that level until mid-September or October. The historical data collected by the Western Regional Climate Center demonstrate that the temperature of 100° can be reached as early as March and continue through October. Temperatures exceeding 125° have been observed in the desert area. Not surprisingly, in Arizona, most deaths from excessive natural heat occurred during late spring and summer with the highest number of deaths occurring during the month of July (589 in 2000-2012), followed by June (318), then August (285), May (141) and September (121). Ninety-five percent of all deaths from exposure to excessive heat occurred during this five month period. Older adults 65 years or older have been at the highest risk of heatstroke or sunstroke among the age groups of Arizona residents. Deaths from excessive heat ranked sixth among the leading causes of accidental death for Arizona elderly 65 years or older in 1998. Out of 646 death certificates of Arizona residents who died from exposure to excessive natural heat in 1992-2009, 554 provided injury location (e.g. home, parking lot, or desert). The number of deaths that occurred outdoors was 2.2 times greater than number of deaths indoors (381 vs. 173). The majority (75.1 percent) of individuals who died outdoor were <65 years of age. (the preceding information taken on April 24, 2014, from the document ADHS Bureau of Public Health Statistics Trends in Morbidity and Mortality from Exposure to Excessive Natural Heat in Arizona, 2012 report): <http://www.azdhs.gov/phs/oeh/heat/index.htm>

CDC Extreme Heat Info:

<http://emergency.cdc.gov/disasters/extremeheat/index.asp>

CDC Extreme Heat Media Toolkit

<http://www.cdc.gov/extremeheat/materials.html>

By recognizing a heat wave in its developmental stages, counties, tribes, cities and other agencies can take actions that will enable the public to prevent a heat related illness or death.

National Weather Services (NWS) Heat-related Messages

The state of Arizona is serviced by four different Weather Forecasting Offices from the National Weather Service (NWS): the Phoenix office has responsibility for southwest/south-central Arizona; Tucson forecasts for southeastern Arizona; Flagstaff covers the north-central and northeast portion of the state, and the office in Las Vegas has responsibility for northwest Arizona. Each forecast office is responsible for their messaging and the development of the criteria to issue their alerts. All forecast offices

issue Excessive Heat Watches & Warnings. The following heat-related messages are listed below.

HEAT WATCH:

(Flagstaff Office) Excessive Heat Watch – is issued for elevations below 4000 feet when conditions are favorable for an excessive heat event in the next 12 to 48 hours. A Watch is used when the risk of excessive heat has increased, but its occurrence and timing are still uncertain. A Watch provides enough lead time so those who need to prepare can do so, such as cities which have excessive heat event mitigation plans.

(Las Vegas Office) Excessive Heat Watch – is issued for elevations below 4000 feet when conditions are favorable for an excessive heat event in the next 12 to 48 hours. A Watch is used when the risk of a heat wave has increased, but its occurrence and timing is still uncertain. A Watch provides enough lead time so those who need to prepare can do so, such as cities which have excessive heat event mitigation plans.

(Phoenix Office) Excessive Heat Watch – is issued when conditions are favorable for an excessive heat event in the next 12 to 48 hours. A Watch is used when the risk of a heat wave has increased, but its occurrence and timing is still uncertain. A Watch provides enough lead time so those who need to prepare can do so, such as cities which have excessive heat event mitigation plans.

(Tucson Office) Excessive Heat Watch – is issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. A Watch is used when the risk of a heat wave has increased, but its occurrence and timing is still uncertain. A Watch provides enough lead time so those who need to prepare can do so, such as cities which have excessive heat event mitigation plans.

HEAT WARNING:

(Flagstaff Office) Excessive Heat Warning – issued for elevations below 4000 feet when an excessive heat event is expected within the next 36 hours. The warning is used for conditions posing a threat to life or property. These bulletins are based on two factors – forecast maximum temperature and the expected duration of these conditions.

(Las Vegas) Excessive Heat Warning – issues for elevations below 4000 feet when an excessive heat events is expected within the next 36 hours and is imminent, or has a very high probability of occurring. The warning is used for conditions posing a threat to life or property. These bulletins are based on four factors – forecast maximum temperature, humidity (apparent temperature), time of year, and the expected duration of these conditions.

(Phoenix Office) Excessive Heat Warning – issued when an excessive heat event is expected in the next 36 hours and is imminent, or has a very high probability of occurring. The warning is used for conditions posing a threat to life or property. These

bulletins are based on four factors – temperature, humidity, time of year, and the expected duration of these conditions. The combination of factors that will trigger one of these heat-related messages varies according to the time of year. These warnings may be issued for a single county or a larger portion of the state.

(Tucson Office) Excessive Heat Warning – issued when an excessive heat event is expected in the next 48 hours and is imminent, or has a very high probability of occurring. The Warning is used for conditions posing a threat to life or property. These bulletins are based on four factors – forecast maximum temperature, apparent temperature (which includes humidity), time of year, and elevation.

IV. Concept of Operations

As an agency that receives federal funding, the Arizona Department of Health Services (ADHS) must incorporate elements of the National Incident Management System (NIMS) into its emergency response plans. The Department's incident command structure, the Public Health Incident Management System (PHIMS) is NIMS compliant. (See Appendix A) Although daily tasks, planning and issues are handled by various Department programs, the PHIMS response is undertaken when a public health emergency arises. PHIMS is a modular structure in that it can expand or contract depending upon the needs of the emergency. For this response plan, not all elements of the PHIMS structure may need to be activated at once, however, if necessary, the ADHS Director may recommend the declaration of a statewide emergency to the Governor and the scope of PHIMS activation may increase. *Note – the ADHS Health Emergency Operations Center (HEOC) Standard Operating Procedure (SOP) outlines specific activation authorities, triggers and levels of activation.

The activities in this plan are based on the heat-related message categories from the National Weather Service (NWS) and the specific instruction from the PHIMS Incident Commander. Some events that may “trigger” the use of this plan include, but are not limited to:

- Consistent number of days of triple-digit, daily maximum temperatures (partnered w/higher night-time temperatures)
- Localized power outage in a community during the May-September timeframe
- The opening of multiple cooling centers/stations in more than one county in Arizona

*Note – prior to this plan being activated, discussions with local public health entities will take place when heat watches or warnings are issued.

1. Excessive Heat Watch

HEOC Manager/Operations

- Notifies the Behavioral Health Business Continuity and Emergency Response Coordinator at (602) 364-2099 of excessive heat watch
- Makes recommendations to counties and tribes to review and update their heat emergency response plans and be prepared to implement.

- Makes recommendations to counties to notify cities, towns and other agencies regarding emergency actions for access and functional needs populations.

HEOC Command Staff/Public Information Officer/Joint Information Center or System (JIC/JIS)

- Drafts heat health alert messages for the public (see Appendix C)
- Updates scripts for English/Spanish heat-related messages on the 24-Hr. ADHS information line (602) 364-4500 or (800) 314-9243.

Operations//EPI Branch Director

- Notifies the Department of Education and the year-round schools in Arizona of the excessive heat watch and they will be encouraged to limit outdoor activities for students.
- Increased surveillance efforts pertaining to heat-related injuries and/or illnesses.

Operations/Behavioral Health Division/Environmental Health Branch

- Environmental Health Branch, in partnership with the PIO, if applicable, will activate the ADHS Extreme Heat Emergency Early Warning Internal Communication Plan (POC is OEH, Environmental Epidemiologist, Climate and Health Program)
- Notifies affected Tribal Regional Behavioral Health Authorities (T/RBHAs) that an excessive heat watch has been issued and that they are to increase outreach efforts and contact outreach teams as applicable.
- Disseminates available resources and public health information via e-mail, and/or telephone, to the affected T/RBHAs.
- Inform T/RBHAs that conditions are likely to result in a life-threatening heat emergency within the next 24 to 48 hours.
In turn, T/RBHAs and providers will:
 - Activate their agency's Heat Emergency Response plan and increase surveillance efforts pertaining to heat-related deaths and injuries.
 - Post and distribute heat warnings and guidance materials at all clinics and service provider locations.

Operations/Licensing

- Identifies licensed facilities by type (e.g. behavioral health, assisted living, long-term care) in affected area(s) to target communication with those facilities or identify potential intake locations in the event that there is inadequate cooling for individuals.
- Provides technical assistance to licensed providers by answering questions about licensing requirements, identifying nearby or unaffected facilities for emergency transfers, and passing on public health information.

Logistics/Information Technology Services & Communications

- Disseminates excessive heat watch information on the ADHS 24-hour information line.
- Sends heat and other health alerts to various groups (healthcare providers, health officers, local health departments, stakeholders) via the Health Alert Network (HAN) and to hospital emergency departments statewide via the EMS system.
- Works with the Arizona Department of Administration (ADOA) to load updated messages to the ADHS 24-hour information line.

2. Excessive Heat Warning

In addition to above activities:

Operations/HEOC Manager

- Notifies local health and emergency management departments to implement their heat emergency response plans.
- May consider opening the Health Emergency Operations Center (HEOC).
- Work in conjunction with local providers to advise area hospitals of the excessive heat warning and urge them to consider the extreme weather conditions when discharging patients.

Operations/Behavioral Health Division/Environmental Health Branch

- Notifies affected Tribal/Regional Behavioral Health Authorities (T/RBHAs) that an excessive heat warning has been issued and that they are to increase outreach efforts and contact outreach teams as applicable.
- T/RBHAs and providers will:
 - Activate their Heat Emergency Response plan and increase surveillance efforts pertaining to heat-related deaths and injuries.
 - Post and distribute heat warnings and guidance materials at all clinics and service provider locations.
- Notifies affected T/RBHAs to initiate outreach efforts and utilize available clinic staff to assist with communication and welfare checks for vulnerable populations and clients who may be at risk of severe health impacts due to extreme heat.
- Coordinates to have T/RBHAs and trained Crisis Intervention Specialists, if needed, provide behavioral health screening, coordination and crisis counseling at cooling stations, hydration centers, emergency shelters or other locations established by the city or county as a result of the emergency.
- The Division of Behavioral Health, T/RBHA staff and the Division of Licensing will immediately coordinate when there are any reports of a facility licensed by ADHS (including behavioral health and supervisory care homes) exceeding temperatures or experiencing air conditioning operational issues. If the licensed facility is part of the behavioral health contracted network, T/RBHA will assist in relocation of residents if needed.

Operations/Licensing

- The Division of Licensing will serve in any capacity necessary to assist consumers and providers of health care and child care in licensed facilities during a response to extreme heat.

3. Inter-Agency Coordination

The Operations Section Chief will use the assistance of various operations section leads and other HEOC branches to coordinate the implementation of this plan with the following divisions and agencies:

- Division of Public Health Preparedness Line (assisted by Logistics/Communications)
- Joint Information System (assisted by PIO)
- TRBHAs (assisted by Behavioral Health Lead)
- Projects for Assistance in Transition from Homelessness (PATH) and other Outreach Teams (assisted by Behavioral Health Lead)
- Local Cities and counties (assisted by HEOC Manager)
- Other agencies, including:
 - Homeless Shelters (assisted by Licensing)
 - Parks, Forestry and Recreation Departments (assisted by Environmental Health)
 - HIV Care Directions and other HIV/AIDS advocacy groups (assisted by Office of Epidemiology)

V. Educational Campaign

The ADHS heat emergency education campaign is coordinated with the education campaigns of the National Weather Service, counties, Regional Behavioral Health Authorities (RBHAs), Tribal Regional Behavioral Health Authorities (TRBHAs) and other volunteer organizations throughout the State. The Incident Commander and the Public Information Officer will work with the Epidemiology and Disease Control (EDC) Branch Director, Behavioral Health Branch Director and Hospital and Healthcare Branch Director to draft and release English and Spanish messages for electronic, written and media outlets such as the statewide AZ Emergency Information Network (AZEIN) <http://www.azein.gov/azein/default.aspx> in advance of excessive high temperatures. The AZEIN system provides on-line resource information to the citizens of Arizona and is an effective venue for heat-related emergency alerts and bulletins.

The Environmental Health Branch and Division of Behavioral Health Branch distribute a bilingual English and Spanish brochure containing frequently asked information on health risks and necessary precautions during a heat wave. This and other materials will emphasize what portion of the population is at risk, how to recognize and prevent heat illness, and the importance of staying cool, hydrated, and informed during periods

of excessive heat. Additional information includes the need to look out for neighbors and older adults, heat-related risks to family pets, medication-associated risks and where to call for assistance.

The brochure and educational materials are to be distributed to the T/RBHAs and providers, including medical clinics and Projects for Assistance in Transition from Homelessness (PATH) outreach teams (they will distribute among the homeless and other at risk populations).

ADHS will also encourage jurisdictions to create local heat related resource cards listing information such as locations of water stations, cooling stations and agencies providing extended hours of medical and shelter services for the homeless population and who to contact for “well watch” services.

The Environmental Health Branch has developed communication tools to educate Arizonans about heat-related illness awareness, prevention, and treatment. As part of the campaign to educate Arizonans, the Branch developed educational toolkits for some of Arizona’s most vulnerable populations, including school-aged children and older adults; an outdoor workers. The toolkits offer a variety of educational materials to fit the needs of organizations serving these populations. Materials include brochures, posters, tip sheets, a heat index safety chart, educational videos, and activities. The school-aged children toolkit also offers heat-related illness prevention training for teachers and school health staff to earn continuing education units (CEUs). Materials for each of the toolkits are available at the following location: <http://www.azdhs.gov/phs/oeh/heat/extreme.htm>.

The Environmental Health Branch has also partnered with the National Weather Service (NWS) Warning coordination meteorologists around the state to efficiently relay heat warning information to stakeholders and the general public. In addition, the Environmental Health Branch developed a communication plan that translates warning information released by the NWS meteorologists. The messages are customized to fit the needs of various targeted audiences with specific health information and resources.

The communication plan utilizes multiple media channels to release warning information, including social media channels (e.g. Facebook, Twitter), website updates, and emails tailored for the public, licensed care facilities, and schools. In addition, the Environmental Health Branch coordinates with Public Information Officer to release heat safety tips throughout the warm season (May-September) on social media to help maintain awareness of the issue. School staff and the general public can sign-up to receive email alerts at the following location: <http://www.azdhs.gov/phs/oeh/heat/index.htm>

When the NWS issues a Severe Weather Warning (such as an Excessive Heat Warning or Excessive Heat Watch), NWS typically issues the warning for only a portion of a county, not the entire county. This is due to the fact that Arizona counties generally

cover large areas and weather events typically have impacts at smaller scales. The Environmental Health Branch developed a guide on how to interpret location warning areas provided by the NWS. The Program has also made NWS maps publicly available that break down the state of Arizona, as well as individual counties, into well-defined subdivisions. The maps and guide are available at the following location: <http://www.azdhs.gov/phs/oeht/heat/maps.htm#warning-areas>.

In order to describe the health effects of extreme heat, the Environmental Health Branch performs surveillance on illnesses and death related to extreme heat using hospital discharge data and death certificate records. The surveillance data can help with information needed in news releases and for planning purposes. A summary report of the 2012 findings can be found at the following location: <http://www.azdhs.gov/phs/oeht/heat/news.htm>

The Environmental Health Branch creates and updates maps showing social and medical vulnerability, areas prone to the “Urban-Heat Island Effect”, and other weather-related variables (such as historical temperature and precipitation maps). These maps will help improve educational outreach efforts.

The Environmental Health Branch is also building capacity across the state to address extreme heat events. A Statewide Heat Preparedness Workgroup was created in the spring of 2013 to collaboratively address heat safety projects and share resources. Organizations and agencies at state and local levels contribute towards efforts to reduce heat-related illness and deaths. The Environmental Health Branch also provides technical assistance to county health departments developing strategic plans for extreme weather.

VI. Recommendations for County Heat Emergency Response Plans

In addition to listing activities in accordance with each of the two National Weather Service warnings, the following components are recommended to be part of a county heat emergency response plan:

- Declaring a local emergency
- Heat emergency plan triggers
- Notification Protocols
- County EOC activation
- Risk Communications
- Education campaign
- Information distribution systems and methods
- Use of volunteers
- Roles and responsibilities of county departments
- Post-Event Evaluations

VII. Tribal Regional Behavioral Health Authority (TRBHA) and Regional Behavioral Health Authority (RBHA) Heat Emergency Response Plans

All TRBHAs and RBHAs will be required to develop their own agency heat emergency response plans to incorporate specific regional activities that will be undertaken in a heat emergency. The T/RBHA heat emergency response plans are due to ADHS/DBHS annually and should address the following:

- Homeless outreach activities and information published through media press releases or distributed to contracted providers.
- Outreach and home visits to elderly, individuals with a serious mental illness, homeless, medically frail and/or shut-ins T/RBHAs should develop a list of individuals who may be at risk, prior to the alert.
- Consider extended work hours and prepare for individuals spending extended hours at facilities to avoid heat.
- Develop transportation plans as a part of the heat emergency response plan, including plans to transport individuals who have increased risk and are unable to access public transportation to T/RBHA appointments or to pick up medications.
- Provide crisis mobile teams and other outreach teams working in the community (e.g. ACT, PATH, etc.) with additional water and information on local resources.
- Display information in agency lobbies and develop distribution mechanisms for materials addressing individual protection and appropriate measures to follow during extreme heat.
- Publicize heat emergency response plans at T/RBHA Community Forums, newsletters, etc.
- Provide training on recognizing symptoms and providing first aid for heat related illness.

VIII. Plan Maintenance

It is the responsibility of the Bureau of Public Health Emergency Preparedness to ensure that the plan is reviewed and updated on an annual basis. The review will consist of:

- Reviewing plan implementation, coordination and activation of what worked and which of the above action steps require further refinement.
- Establishing an on-going core team of emergency contacts or their designees.
- Identifying all agencies contacted and any additional steps needed from their perspective.
- Making necessary changes to the protocol based on information gathered and available resources.

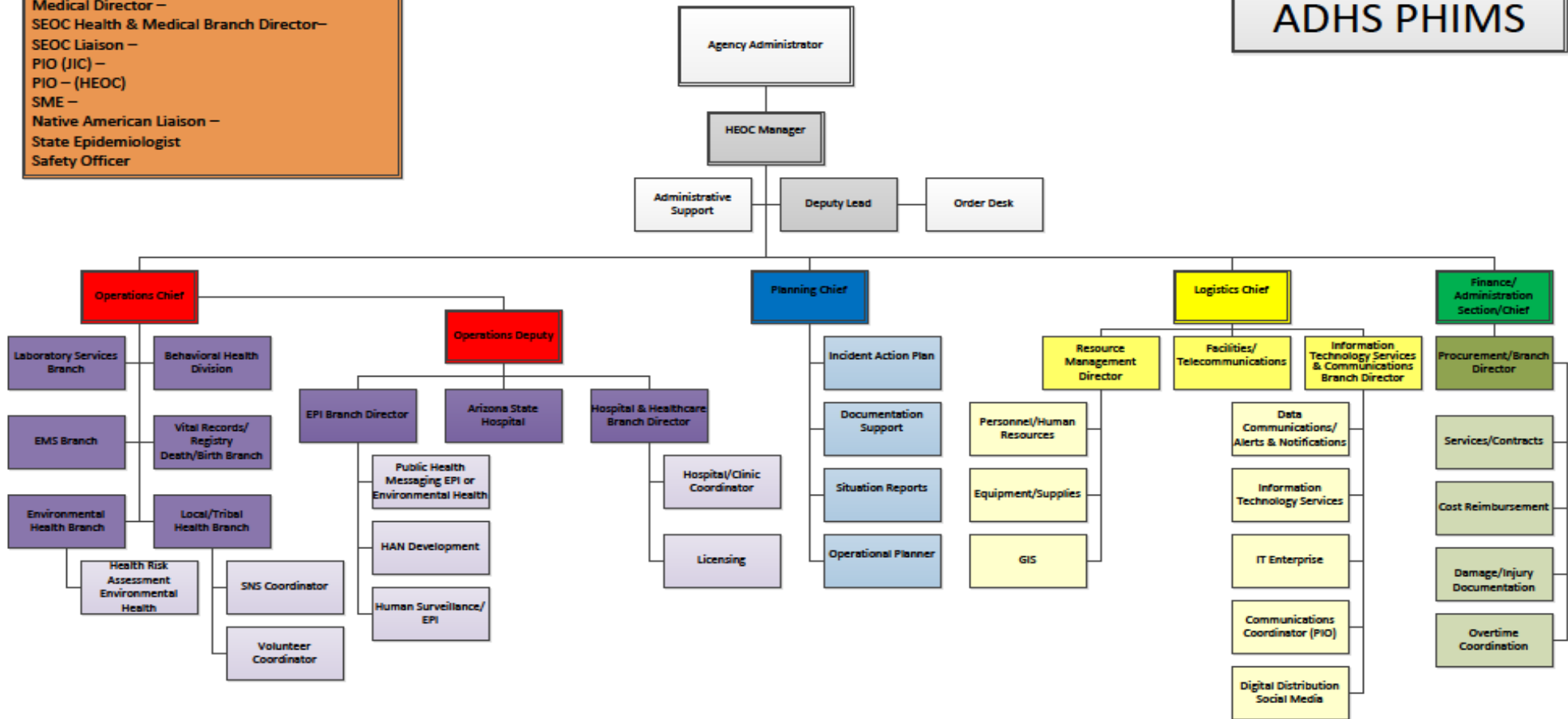
IX. Appendices

- A. Public Health Incident Management System (PHIMS) Organization Chart Template
- B. Contact Information
- C. Sample News Releases
- D. CDC: Frequently Asked Questions (FAQ) About Extreme Heat
- E. State/County/Tribal Public Health Resources
- F. Heat Related Illnesses and Safety
- G. Wet Bulb Guidelines
- H. Heat Index Chart
- I. Other Resources
- J. Heat Resource Guide

APPENDIX A – PHIMS Organization Chart Template

ADHS Policy Advisor – Legislative Liaison/rules
 Medical Director –
 SEOC Health & Medical Branch Director–
 SEOC Liaison –
 PIO (JIC) –
 PIO – (HEOC)
 SME –
 Native American Liaison –
 State Epidemiologist
 Safety Officer

ADHS PHIMS



APPENDIX B - Contact Information

ADHS Division of Behavioral Health

- DBHS Division Chief of Compliance (602) 364-4658
- DBHS Business Continuity and Emergency Response Coordinator (602) 364-2099

ADHS Division of Licensing

- Office of the Assistant Director (602) 364-3066
- Assisted Living Licensing (602) 364-2632 (ask for Surveyor of the Day)
- Office of Behavioral Health Licensure (602) 364-2595

ADHS Office of Environmental Health

- Office Chief (602) 364-3142
- Risk Assessment and Health Consultation Manager (602) 364-3128
- Climate and Health Program (602) 364-3673

ADHS Bureau of Public Health Emergency Preparedness

- Bureau Chief (602) 364-3571
- Deputy Bureau Chief (602) 364-3439
- Preparedness Planner (602) 448-3850

APPENDIX C – Sample News Releases

FOR IMMEDIATE RELEASE – (date)

Contact: Laura Oxley, ADHS Public Information: (602) 542-1094

Ken Waters, NWS Public Information: (602) 275-7002 ext. 223

STAYING HEALTHY IN ARIZONA’S DEADLY SUMMER HEAT

The number one weather-related danger in our country is heat; more people die from it than floods, hurricanes and tornadoes put together. The danger to people from Arizona’s high temperatures is three to seven times worse than the rest of the country. .

With plenty of heat still on the horizon, the Arizona Department of Health Services and the National Weather Service urge everyone to take precautions against heat related illness.

"Summer time heat is the most dangerous weather phenomenon we face in Arizona," said Ken Waters, of the National Weather Service in Phoenix. The National Weather Service issues Heat Watches and Warnings to let people know which days pose the greatest risk for heat-related illness. ADHS has a similar system set up to help schools, child care centers, and other licensed facilities be prepared for the heat.

"If you're going to be out in the heat, you have to be ready," said Will Humble, ADHS Director. "If you're exercising or working, start early and be sure to drink a lot of water before you start. If you have a medical condition or are dehydrated, take extra steps to stay cool. And if you have to wait in a parked car, keep the air conditioning running."

Temperatures inside parked vehicles climb very rapidly. Temperatures rise approximately 20 degrees (F) in the first 10 minutes, potentially reaching more than 130 degrees in only 10 minutes. Temperatures in this range can cause serious illness or death in only a few minutes.

People who work or exercise in the heat, should drink plenty of water before, during, and after activity and should take frequent breaks in a shaded area. If you have a medical condition, are taking a medication that can dehydrate you or you are already dehydrated, you should consider avoiding strenuous or prolonged physical activity during the hottest part of the day.

People suffer heat-related illness when the body's temperature control system is overloaded and the body can no longer cool itself. Symptoms of heat illness include heavy sweating, muscle cramps, weakness, dizziness, nausea, weak but rapid pulse and headaches. People with these symptoms should go to an air-conditioned area, find shade, loosen restrictive clothing, drink water slowly, cool skin with a damp cloth, and rest. If symptoms worsen, call 9-1-1. Seek immediate medical care for the affected person. Heat stroke is a life-threatening illness.

The most effective way to fight the heat is air-conditioning, at home or in a public building such as a mall, library or recreation center. If air conditioning is not available, pull the

shades over the windows and use cross-ventilation and fans to cool rooms. A cool shower or bath also is an effective way to cool off. Limit use of stoves and ovens to keep home temperatures lower.

###

Other tips to avoid heat-related illness:

- Never leave infants, children, adults needing assistance or pets inside a parked vehicle.
- Increase water intake, regardless of activity level. Don't wait until thirsty to drink water; drink more water than one's thirst indicates.
- Avoid "heat hangover." Continue to drink fluids even after strenuous activity. This will help the body maintain optimum hydration and help prevent the after effects of heat exposure such as headaches and fatigue.
- Avoid beverages containing alcohol, caffeine or sugar.
- Avoid very cold beverages as they cause stomach cramps.
- Limit exercise or outdoor activity between the hours of 11 a.m. and 3 p.m. when the sun is at its peak intensity. If active during this time frame, drink a minimum of 16 to 32 ounces of water each hour.
- Some medications, both prescription and over-the-counter, may increase the risk of heat-related illness. Consult your healthcare provider if you have questions.
- Check on a friend or neighbor, and have someone do the same for you during excessively hot days.

When outdoors:

- Wear a sunscreen with a minimum SPF 30. Apply at least 30 minutes prior to going outdoors. Re-apply as necessary.
- Rest frequently in the shade so the body's temperature has a chance to recover.
- If unaccustomed to working or exercising in a hot environment, limit exercise or work time and gradually increase the pace.
- Wear lightweight, loose-fitting, light-colored clothing; sunglasses to protect the eyes; and a wide-brimmed hat to provide shade and keep the head cool.
- Take special precaution with infants and young children by dressing them in loose, cool clothing and shading their heads and faces with hats or an umbrella. Protect their feet with shoes.

FOR IMMEDIATE RELEASE – (date)

Contact: Laura Oxley, ADHS Public Information: (602) 542-1094

HEALTH SERVICES URGES CAUTION AS DEADLY HEAT GRIPS ARIZONA

Arizona's heat is not just uncomfortable, it is deadly. (Insert real-world example) Daytime temperatures have been in the teen triple digits for XX days.

"These are some of the hottest days of summer and people need to be diligent about staying indoors, wearing light clothing and drinking water," said Will Humble, ADHS Director. "People who work outdoors are at especially high risk. People that have outdoor occupations need to take frequent breaks and get more of their work done in the early morning hours if possible.

Young children and the elderly are also at greater risk to suffer from heat-related illness.

"All licensed facilities including childcare centers, assisted livings, healthcare centers, and hospices need to pay attention to modifying activity levels and take care to make sure hydration is increased," said Humble. "Take the time to stop by and ensure your neighbors are taking extra precautions as well."

People suffer heat-related illness when the body's temperature control system is overloaded and the body can no longer cool itself. If fluids are not replaced soon enough, heat stroke can result, potentially leading to brain damage or death.

Symptoms of heat illness include heavy sweating, muscle cramps, weakness, dizziness, nausea, weak but rapid pulse and headaches. People with these symptoms should go to an air conditioned area, find shade, drink water slowly, loosen restrictive clothing, cool skin with a damp cloth, and rest. If symptoms worsen, call 9-1-1. Seek immediate medical care for the affected person. Heat stroke is a life-threatening illness.

Staying in an air-conditioned area, either at home or in a public building such as a mall, library or recreation center is the most effective way to fight heat. If air conditioning is not available, and the temperature is less than 90°, pull the shades over the windows and use cross-ventilation and fans to cool rooms. A cool shower or bath also is an effective way to cool off. Limit use of stoves and ovens to keep home temperatures lower.

###

Other tips to avoid heat-related illness:

- Never leave infants, children, adults needing assistance, or pets inside a parked vehicle.
- Increase water intake, regardless of activity level. Don't wait until thirsty to drink water; drink more water than one's thirst indicates.
- Avoid "heat hangover." Continue to drink water even after strenuous activity. This will help the body maintain optimum hydration, and help prevent the after effects of heat exposure such as headaches and fatigue.
- Avoid beverages containing alcohol, caffeine, or sugar.
- Avoid very cold beverages as they cause stomach cramps.
- Limit exercise or outdoor activity between the hours of 11 a.m. and 3 p.m. when the sun is at its peak intensity. If active during this time frame, drink a minimum of 16 to 32 ounces of water each hour.
- Some medications, both prescription and over-the-counter, may increase the risk of heat-related illness. Consult your healthcare provider if you have questions.
- Check on a friend or neighbor, and have someone do the same for you during excessively hot days.

When outdoors:

- Wear a sunscreen with a minimum SPF 30. Apply at least 30 minutes prior to going outdoors. Re-apply as necessary.
- Rest frequently in the shade so the body's temperature has a chance to recover.
- If not used to working or exercising in the heat, limit exercise or work time and gradually increase the pace.
- Wear lightweight, loose-fitting, light-colored clothing; sunglasses to protect the eyes; and a wide-brimmed hat to provide shade and keep the head cool.
- Take special precaution with infants and young children by dressing them in loose, light-colored, light-weight clothing and shading their heads and faces with hats or an umbrella. Protect their feet with shoes.

RETURN OF EXTREME SUMMER HEAT BRINGS DEADLY DANGERS

The Arizona Department of Health Services reminds residents to take extra care during the high temperatures. Heat is the number one weather-related killer in our country.

“Temperatures over 110 degrees means taking special precautions to protect ourselves and our loved ones from the risk of heat-related illness and death,” said Will Humble, Director of the Arizona Department of Health Services. “The best way to combat this is to stay hydrated and to stay out of the sun.”

People who work outdoors are at especially high risk. People that have outdoor occupations need to take frequent breaks and get more of their work done in the early morning hours if possible. Young children and the elderly are also at greater risk to suffer from heat-related illness.

“This is a good time to check on your neighbors, especially if they are elderly,” Humble said.

People suffer heat-related illness when the body’s temperature control system is overloaded and the body can no longer cool itself. If fluids are not replaced soon enough, heat stroke can result, potentially leading to brain damage or death.

Symptoms of heat illness include heavy sweating, muscle cramps, weakness, dizziness, nausea, weak but rapid pulse and headaches. People with these symptoms should go to an air conditioned area, find shade, drink water slowly, loosen restrictive clothing, cool skin with a damp cloth, and rest. If symptoms worsen, call 9-1-1. Seek immediate medical care for the affected person. Heat stroke is a life-threatening illness.

Staying in an air-conditioned area, either at home or in a public building such as a mall, library or recreation center is the most effective way to fight heat. If air conditioning is not available, and the temperature is less than 90°, pull the shades over the windows and use cross-ventilation and fans to cool rooms. A cool shower or bath also is an effective way to cool off. Limit use of stoves and ovens to keep home temperatures lower.

###

Other tips to avoid heat-related illness:

- Never leave infants, children, adults needing assistance, or pets inside a parked vehicle.
- Increase water intake, regardless of activity level. Don't wait until thirsty to drink water; drink more water than one's thirst indicates.
- Avoid "heat hangover." Continue to drink water even after strenuous activity. This will help the body maintain optimum hydration, and help prevent the after effects of heat exposure such as headaches and fatigue.
- Avoid beverages containing alcohol, caffeine, or sugar.
- Avoid very cold beverages as they cause stomach cramps.
- Limit exercise or outdoor activity between the hours of 11 a.m. and 3 p.m. when the sun is at its peak intensity. If active during this time frame, drink a minimum of 16 to 32 ounces of water each hour.
- Some medications, both prescription and over-the-counter, may increase the risk of heat-related illness. Consult your healthcare provider if you have questions.
- Check on a friend or neighbor, and have someone do the same for you during excessively hot days.

When outdoors:

- Wear a sunscreen with a minimum SPF 30. Apply at least 30 minutes prior to going outdoors. Re-apply as necessary.
- Rest frequently in the shade so the body's temperature has a chance to recover.
- If not used to working or exercising in the heat, limit exercise or work time and gradually increase the pace.
- Wear lightweight, loose-fitting, light-colored clothing; sunglasses to protect the eyes; and a wide-brimmed hat to provide shade and keep the head cool.
- Take special precaution with infants and young children by dressing them in loose, light-colored, light-weight clothing and shading their heads and faces with hats or an umbrella. Protect their feet with shoes.

****NOTE – All heat-related press releases will be translated for our Spanish-speaking citizens**

APPENDIX D – CDC Frequently Asked Questions (FAQ) About Extreme Heat

1. What happens to the body as a result of exposure to extreme heat?

People suffer heat-related illness when the body's temperature control system is overloaded. The body normally cools itself by sweating. But under some conditions, sweating just isn't enough. In such cases, a person's body temperature rises rapidly. Very high body temperatures may damage the brain or other vital organs. Several factors affect the body's ability to cool itself during extremely hot weather. When the humidity is high, sweat will not evaporate as quickly, preventing the body from releasing heat quickly. Other conditions that can limit the ability to regulate temperature include old age, youth (age 0-4), obesity, fever, dehydration, heart disease, mental illness, poor circulation, sunburn, and prescription drug use and alcohol use.

2. Who is at greater risk for heat-related illness?

Those at a greater risk for heat-related illness include infants and children up to four years of age, middle-aged males (mainly outdoor workers), people 65 years of age and older, people who are overweight, and people who are ill or on certain medications.

3. What is heat stroke?

Heat stroke is the most serious heat-related illness. It occurs when the body becomes unable to control its temperature: the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided.

4. What are the warning signs of a heat stroke?

Warning signs of heat stroke vary but may include the following:

- An extremely high body temperature (above 103°F)
- Red, hot, and dry skin (no sweating)
- Rapid, strong pulse
- Throbbing headache
- Dizziness
- Nausea
- Confusion
- Unconsciousness

5. **What should I do if I see someone with any of the warning signs of heat stroke?**

If you see any of these signs, you may be dealing with a life-threatening emergency. Have someone call for immediate medical assistance while you begin cooling the victim. Do the following:

- Get the victim to a shady area.
- Cool the victim rapidly, using whatever methods you can. For example, immerse the victim in a tub of cool water; place the person in a cool shower; spray the victim with cool water from a garden hose; sponge the person with cool water; or if the humidity is low, wrap the victim in a cool, wet sheet and fan him or her vigorously.
- Monitor body temperature and continue cooling efforts until the body temperature drops to 101-102°F.
- If emergency medical personnel are delayed, call the hospital emergency room for further instructions.
- Do not give the victim alcohol to drink.
- Get medical assistance as soon as possible.

6. **What is heat exhaustion?**

Heat exhaustion is a milder form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. Those most prone to heat exhaustion are elderly people, those with high blood pressure, and those working or exercising in a hot environment.

7. **What are the warning signs of heat exhaustion?**

The warning signs of heat exhaustion include the following:

- Heavy sweating
- Paleness
- Muscle cramps
- Tiredness
- Weakness
- Dizziness
- Headache
- Nausea or vomiting
- Fainting

The skin may be cool and moist. The pulse rate will be fast and weak, and breathing will be fast and shallow. If heat exhaustion is untreated, it may progress to heat stroke. See medical attention if symptoms worsen or last longer than one hour.

8. What steps can be taken to cool the body during heat exhaustion?

- Drink cool, nonalcoholic beverages.
- Rest.
- Take a cool shower, bath, or sponge bath.
- Seek an air-conditioned environment.
- Wear lightweight clothing.

9. What are heat cramps and who is affected?

Heat cramps are muscle pains or spasms – usually in the abdomen, arms, or legs that may occur in association with strenuous activity. People who sweat a lot during strenuous activity are prone to heat cramps. This sweating depletes the body's salt and moisture. The low salt level in the muscles causes painful cramps. Heat cramps may also be a symptom of heat exhaustion. If you have heart problems or are on a low-sodium diet, seek medical attention for heat cramps.

10. What should I do if I have heat cramps?

If medical attention is not necessary, take the following steps:

- Stop all activity and sit quietly in a cool place.
- Drink clear juice or a sports beverage.
- Do not return to strenuous activity for a few hours after the cramps subside because further exertion may lead to heat exhaustion or heat stroke.
- Seek medical attention for heat cramps if they do not subside in 1 hour.

11. What is heat rash?

Heat rash is a skin irritation caused by excessive sweating during hot, humid weather. It can occur at any age but is most common in young children. Heat rash looks like a red cluster of pimples or small blisters. It is more likely to occur on the neck and upper chest, in the groin, under the breasts, and in elbow creases.

12. What is the best treatment for heat rash?

The best treatment for heat rash is to provide a cooler, less humid environment. Keep the affected area dry. Dusting powder may be used to increase comfort, but avoid using ointments or creams -- they keep the skin warm and moist and may make the condition worse.

13. Can medications increase the risk of heat-related illness?

The risk for heat-related illness and death may increase among people using the following drugs: (1) psychotropics, which affect psychic function, behavior, or experience (e.g. haloperidol or chlorpromazine); (2) medications for Parkinson's disease, because they can inhibit perspiration; and (3) tranquilizers such as phenothiazines, butyrophenones, and thiozanthenes.

14. How effective are electric fans in preventing heat-related illness?

Electric fans may provide comfort, but when the temperature is in the high 90s, fans will not prevent heat-related illness, a good rule of thumb in determining if a fan is effective is the indoor temperature (100 degrees outside, but 80 inside is a good trigger for turning on fans. Taking a cool shower or bath or moving to an air-conditioned place is a much better way to cool off. Air conditioning is the strongest protective factor against heat-related illness. Exposure to air conditioning for even a few hours a day will reduce the risk for heat-related illness. Consider visiting a shopping mall or public library for a few hours.

15. How can people protect their health when temperatures are extremely high?

Remember to keep cool and use common sense. Drink plenty of fluid, replace salts and minerals, wear appropriate clothing and sunscreen, pace yourself, stay cool indoors, schedule outdoor activities carefully, use a buddy system, monitor those at risk, and adjust to the environment.

16. How much should I drink during hot weather?

During hot weather you will need to drink more liquid than your thirst indicates. Increase your fluid intake, regardless of your activity level. During heavy exercise in a hot environment, drink two to four glasses (16-32 ounces) of cool fluids each hour. Avoid drinks containing alcohol because they will actually cause you to lose more fluid.

17. Should I take salt tablets during hot weather?

Do not take salt tablets unless directed by your doctor. Heavy sweating removes salt and minerals from the body. These are necessary for your body and must be replaced. The easiest and safest way to do this is through your diet. Drink fruit juice or a sports beverage when you exercise or work in the heat.

18. What is the best clothing for hot weather or a heat wave?

Wear as little clothing as possible when you are at home. Choose lightweight, light-colored, loose-fitting clothing. In the hot sun, a wide-brimmed hat will provide shade and keep the head cool. If you must go outdoors, be sure to apply sunscreen 30 minutes prior to going out and continue to reapply according to the package directions. Sunburn affects your body's ability to cool itself and causes a loss of body fluids. It also causes pain and damages the skin.

19. What should I do if I work in a hot environment?

Pace yourself. If you are not accustomed to working or exercising in a hot environment, start slowly and pick up the pace gradually. If exertion in the heat makes your heart pound and leaves you gasping for breath, STOP all activity. Get

into a cool area or at least in the shade, and rest, especially if you become lightheaded, confused, weak, or faint.

The above information is provided by the Centers for Disease Control and Prevention National Center for Environmental Health <http://www.bt.cdc.gov/disasters/extremeheat/fag.asp>

APPENDIX E – STATE/COUNTY/TRIBAL PUBLIC HEALTH RESOURCES

Below is a list of Arizona resources to help provide additional, general public health information, along with preventative measures that can help citizens cope with the immediate and possibly long-term consequences of the high Arizona temperatures.

State:

Arizona Department of Health Services/Office of Environmental Health
Protecting Yourself from Arizona's Heat

<http://www.azdhs.gov/phs/oeh/heat/index.htm>

Arizona Health Matters:

<http://www.arizonahealthmatters.org/index.php>

Central Region:

Maricopa County:

Surviving Arizona's Extreme Heat:

<http://www.maricopa.gov/PublicHealth/Programs/Heat/>

Homeless Outreach:

<http://www.maricopa.gov/publichealth/services/Homeless/outreach.aspx>

Seasonal Weekly Heat Reports:

<http://www.maricopa.gov/publichealth/Services/EPI/Reports/heat.aspx>

Phoenix Heat Relief Network:

<http://phoenix.gov/humanservices/programs/volunteer/heatrelief/>

Interactive Phoenix Heat Relief network sites

<http://www.coolme.today/#phoenix>

Pinal County:

<http://pinalcountyz.gov/publichealth/Pages/Home.aspx>

Gila County:

http://www.gilacountyz.gov/government/health_and_emergency_services/index.php

Southeast Region:

Pima County:

<http://www.pimahealth.org/heat/>

Santa Cruz County:

<http://www.co.santa-cruz.az.us/health/index.html>

Cochise County:

http://cochise.az.gov/cochise_health.aspx?id=260

Graham County:

<http://www.graham.az.gov/health-department/>

Greenlee County:

<http://www.co.greenlee.az.us/health/>

Northern Region:

Yavapai County:

<http://www.yavapaihealth.com/>

Apache County:

<http://www.co.apache.az.us/Departments/HealthDepartment/HealthDept.htm>

Navajo County:

<http://www.navajocountyz.gov/pubhealth/>

Coconino County:

<http://www.coconino.az.gov/index.aspx?NID=221>

Link for Pet Brochure (winter /summer):

<http://www.coconino.az.gov/DocumentCenter/View/442>

Western Region:

Mohave County:

<http://www.mohavecounty.us/ContentPage.aspx?id=127>

La Paz County:

<http://www.lpchd.com/index.html>

Yuma County:

<http://www.yumacountyaz.gov/index.aspx?page=338>

Heat-Related Info

<http://www.yumacountyaz.gov/index.aspx?page=918>

APPENDIX F - HEAT RELATED ILLNESSES AND SAFETY

(Information compiled by ADHS Industrial Hygienist and Safety Officer)

HOW THE BODY HANDLES HEAT

The human body, being warm blooded, maintains a fairly constant internal temperature, even though it is being exposed to varying environmental temperatures. To keep internal body temperatures within safe limits, the body must get rid of its excess heat, primarily through varying the rate and amount of blood circulation through the skin and the release of fluid onto the skin by the sweat glands. These automatic responses usually occur when the temperature of the blood exceeds 98.6°F and are kept in balance and controlled by the brain. In this process of lowering internal body temperature, the heart begins to pump more blood, blood vessels expand to accommodate the increased flow, and the microscopic blood vessels (capillaries) which thread through the upper layers of the skin begin to fill with blood. The blood circulates closer to the surface of the skin, and the excess heat is lost to the cooler environment.

If heat loss from increased blood circulation through the skin is not adequate, the brain continues to sense overheating and signals the sweat glands in the skin to shed large quantities of sweat onto the skin surface. Evaporation of sweat cools the skin, eliminating large quantities of heat from the body.

As environmental temperatures approach normal skin temperature, cooling of the body becomes more difficult. If air temperature is as warm as or warmer than the skin, blood brought to the body surface cannot lose its heat. Under these conditions, the heart continues to pump blood to the body surface, the sweat glands pour liquids containing electrolytes onto the surface of the skin and the evaporation of the sweat becomes the principal effective means of maintaining a constant body temperature. Sweating does not cool the body unless the moisture is removed from the skin by evaporation. Under conditions of high humidity, the evaporation of sweat from the skin is decreased and the body's efforts to maintain an acceptable body temperature may be significantly impaired. These conditions adversely affect an individual's ability to work in the hot environment. With so much blood going to the external surface of the body, relatively less goes to the active muscles, the brain, and other internal organs; strength declines; and fatigue occurs sooner than it would otherwise. Alertness and mental capacity also may be affected. Workers who must perform delicate or detailed work may find their accuracy suffering, and others may find their comprehension and retention of information lowered.

SAFETY PROBLEMS

Certain safety problems are common to hot environments. Heat tends to promote accidents due to the slipperiness of sweaty palms, dizziness, or the fogging of safety glasses. Wherever there exists molten metal hot surfaces, steam, etc., the possibility of burns from accidental contact also exists.

Aside from these obvious dangers, the frequency of accidents in general appears to be higher in hot environments than in more moderate environmental conditions. One reason

is that working in a hot environment lowers the mental alertness and physical performance of an individual. Increased body temperature and physical discomfort promote irritability, anger, and other emotional states which sometimes cause workers to overlook safety procedures or to divert attention from hazardous tasks.

HEALTH PROBLEMS

Excessive exposure to a hot work environment can bring about a variety of heat-induced disorders.

CAUTION: Persons with heart problems or those on a low sodium diet who work in hot environments should consult a physician about what to do under these conditions.

Heat Stroke

Heat stroke is the most serious of health problems associated with working in hot environments. It occurs when the body's temperature regulatory system fails and sweating becomes inadequate. The body's only effective means of removing excess heat is compromised with little warning to the victim that a crisis stage has been reached.

A heat stroke victim's skin is hot, usually dry, red or spotted. Body temperature is usually 105°F or higher, and the victim is mentally confused, delirious, perhaps in convulsions, or unconscious. Unless the victim receives quick and appropriate treatment, death can occur.

Any person with signs or symptoms of heat stroke requires immediate hospitalization. However, first aid should be immediately administered. This includes removing the victim to a cool area, thoroughly soaking the clothing with water, and vigorously fanning the body to increase cooling. Further treatment at a medical facility should be directed to the continuation of the cooling process and the monitoring of complications which often accompany the heat stroke. Early recognition and treatment of heat stroke are the only means of preventing permanent brain damage or death.

Heat Exhaustion

Heat exhaustion includes several clinical disorders having symptoms which may resemble the early symptoms of heat stroke. Heat exhaustion is caused by the loss of large amounts of fluid by sweating, sometimes with excessive loss of salt. A worker suffering from heat exhaustion still sweats but experiences extreme weakness or fatigue, giddiness, nausea, or headache. In more serious cases, the victim may vomit or lose consciousness. The skin is clammy and moist, the complexion is pale or flushed, and the body temperature is normal or only slightly elevated.

In most cases, treatment involves having the victim rest in a cool place and drink plenty of liquids. Victims with mild cases of heat exhaustion usually recover

spontaneously with this treatment. Those with severe cases may require extended care for several days. There are no known permanent effects.

Heat Cramps

Heat cramps are painful spasms of the muscles that occur among those who sweat profusely in heat, drink large quantities of water, but do not adequately replace the body's salt loss. The drinking of large quantities of water tends to dilute the body's fluids, while the body continues to lose salt. Shortly thereafter, the low salt level in the muscles causes painful cramps.

The affected muscles may be part of the arms, legs, or abdomen, but tired muscles (those used in performing the work) are usually the ones most susceptible to cramps. Cramps may occur during or after work hours and may be relieved by taking salted liquids by mouth.

Fainting

A worker who is not accustomed to hot environments and who stands erect and immobile in the heat may faint. With enlarged blood vessels in the skin and in the lower part of the body due to the body's attempts to control internal temperature, blood may pool there rather than return to the heart to be pumped to the brain.

Upon lying down, the worker should soon recover. By moving around, and thereby preventing blood from pooling, the patient can prevent further fainting.

Heat Rash

Heat rash, also known as prickly heat, is likely to occur in hot, humid environments where sweat is not easily removed from the surface of the skin by evaporation and the skin remains wet most of the time. The sweat ducts become plugged, and a skin rash soon appears. When the rash is extensive or when it is complicated by infection, prickly heat can be very uncomfortable and may reduce a worker's performance.

The worker can prevent this condition by resting in a cool place part of each day and by regularly bathing and drying the skin.

Transient Heat Fatigue

Transient heat fatigue refers to the temporary state of discomfort and mental or psychological strain arising from prolonged heat exposure. Workers unaccustomed to the heat are particularly susceptible and can suffer, to varying degrees, a decline in task performance, coordination, alertness, and vigilance.

The severity of transient heat fatigue will be lessened by a period of gradual adjustment to the hot environment (heat acclimatization).

PREPARING FOR THE HEAT

One of the best ways to reduce heat stress on workers is to minimize heat in the workplace. However, there are some work environments where heat production is difficult to control, such as when furnaces or sources of steam or water are present in the work area or when the workplace itself is outdoors and exposed to varying warm weather conditions.

Humans are, to a large extent, capable of adjusting to the heat. This adjustment to heat, under normal circumstances, usually takes about 5 to 7 days, during which time the body will undergo a series of changes that will make continued exposure to heat more endurable.

On the first day of work in a hot environment, the body temperature, pulse rate, and general discomfort will be higher. With each succeeding daily exposure, all of these responses will gradually decrease, while the sweat rate will increase. When the body becomes acclimated to the heat, the worker will find it possible to perform work with less strain and distress.

Gradual exposure to heat gives the body time to become accustomed to higher environmental temperatures. Heat disorders in general are more likely to occur among workers who have not been given time to adjust to working in the heat or among workers who have been away from hot environments and who have gotten accustomed to lower temperatures. Hot weather conditions of the summer are likely to affect the worker who is not acclimatized to heat. Likewise, workers who return to work after a leisurely vacation or extended illness may be affected by the heat in the work environment. Whenever such circumstances occur, the worker should be gradually reacclimatized to the hot environment.

LESSENING STRESSFUL CONDITIONS

Many industries have attempted to reduce the hazards of heat stress by introducing engineering controls, training workers in the recognition and prevention of heat stress, and implementing work-rest cycles. Heat stress depends, in part, on the amount of heat the worker's body produces while a job is being performed. The amount of heat produced during hard, steady work is much higher than that produced during intermittent or light work. Therefore, one way of reducing the potential for heat stress is to make the job easier or lessen its duration by providing adequate rest time.

Mechanization of work procedures can often make it possible to isolate workers from the heat sources (perhaps in an air-conditioned booth) and increase overall productivity by decreasing the time needed for rest. Another approach to reducing the level of heat stress is the use of engineering controls which include ventilation and heat shielding.

NUMBER AND DURATION OF EXPOSURES

Rather than be exposed to heat for extended periods of time during the course of a job, workers should, wherever possible, be permitted to distribute the workload evenly over

the day and incorporate work-rest cycles. Work-rest cycles give the body an opportunity to get rid of excess heat, slow down the production of internal body heat, and provide greater blood flow to the skin.

Workers employed outdoors are especially subject to weather changes. A hot spell or a rise in humidity can create overly stressful conditions. The following practices can help to reduce heat stress:

1. Postponement of nonessential tasks,
2. Permit only those workers acclimatized to heat to perform the more strenuous tasks, or
3. Provide additional workers to perform the tasks keeping in mind that all workers should have the physical capacity to perform the task and that they should be accustomed to the heat.

Thermal Conditions in the Workplace

A variety of engineering controls can be introduced to minimize exposure to heat. For instance, improving the insulation on a furnace wall can reduce its surface temperature and the temperature of the area around it. In a laundry room, exhaust hoods installed over those sources releasing moisture will lower the humidity in the work area. In general the simplest and least expensive methods of reducing heat and humidity can be accomplished by:

1. Opening windows in hot work areas,
2. Using fans, or using other methods of creating airflow such as exhaust ventilation or air blowers.

Rest Areas

Providing cool rest areas in hot work environments considerably reduces the stress of working in those environments. There is no conclusive information available on the ideal temperature for a rest area. However, a rest area with a temperature near 76/F appears to be adequate and may even feel chilly to a hot, sweating worker, until acclimated to the cooler environment. The rest area should be as close to the workplace as possible. Individual work periods should not be lengthened in favor of prolonged rest periods. Shorter but frequent work-rest cycles are the greatest benefit to the worker.

Drinking Water

In the course of a day's work in the heat, a worker may produce as much as 2 to 3 gallons of sweat. Because so many heat disorders involve excessive dehydration of the body, it is essential that water intake during the workday be about equal to the amount of sweat produced. Most workers exposed to hot conditions drink less fluids than needed because of an insufficient thirst drive. A worker, therefore, should not depend on thirst to signal when and how much to drink. Instead, the worker should drink 5 to 7 ounces of fluids every 15 to 20 minutes to replenish the necessary fluids in the body. There is no optimum temperature of drinking water, but most people tend not to drink warm or very cold fluids as readily as they will cool ones. Whatever the temperature of the water, it must be

palatable and readily available to the worker. Individual drinking cups should be provided-never use a common drinking cup.

Heat acclimatized workers lose much less salt in their sweat than do workers who are not adjusted to the heat. The average American diet contains sufficient salt for acclimatized workers even when sweat production is high. If, for some reason, salt replacement is required, the best way to compensate for the loss is to add a little extra salt to the food. Salt tablets *should not* be used.

Protective Clothing

Clothing inhibits the transfer of heat between the body and the surrounding environment. Therefore, in hot jobs where the air temperature is lower than skin temperature, wearing clothing reduces the body's ability to lose heat into the air.

When air temperature is higher than skin temperature, clothing helps to prevent the transfer of heat from the air to the body. However, this advantage may be nullified if the clothes interfere with the evaporation of sweat.

In dry climates, adequate evaporation of sweat is seldom a problem. In a dry work environment with very high air temperatures, protective clothing could be an advantage to the worker. The proper type of clothing depends on the specific circumstance. Certain work in hot environments may require insulated gloves, insulated suits, reflective clothing, or infrared reflecting face shields.

For extremely hot conditions, thermally conditioned clothing is available. One such garment carries a self-contained air conditioner in a backpack, while another is connected a compressed air source which feeds cool air into the jacket or coveralls through a vortex tube. Another type of garment is a plastic jacket which has pockets that can be filled with dry ice or containers of ice.

Use of PPE and Thermal Stress

PPE retains heat and in some cases can cause a dramatic increase in heat contained in the suit.

All Respirators regardless of type increase heat retention. Self-contained breathing apparatus (SCBA) and or powered air purifying respirators (PAPR) have a stream of fresh air coming through the respirator, however, they still increase heat retention.

Tyvek the white coveralls with booties and hoods increase heat retention to a degree but air can pass through the material therefore some cooling takes place.

Sarnex coated Tyvek or similar chemical resisting clothing does not allow for evaporation and therefore will significantly increase heat retention. These suits if used in the sun also collect radiant heat which causes a greenhouse effect by trapping the heat from the sun inside the suit.

Level A or Level B fully encapsulating suits are the most heat retentive of all PPE. They prevent evaporation and heat levels in the suit on a hot sunny day in Arizona can reach over 135° F.

Working outside, especially in the Southwest, in PPE requires short periods of time working in the protective clothing followed by a longer period in an air conditioned area drinking water. This is a resting period. A person who comes in from wearing PPE in the sun cannot go to another job working in a cool environment. The person must first rest and replenish fluids. For example, the regime for working in fully encapsulated Level B suits on a day where temperatures are 95° F or higher will be 15 minutes work, followed by 45 minutes in the air conditioned room drinking water. This is done because the water loss in 15 minutes at 130° F plus is very significant.

Studies have shown that core body temperatures start to climb under extreme heat exposure as with wearing fully encapsulated suits. Many workers after September 11 working at the World Trade Center were treated for heat related illnesses due to working too long in PPE with inadequate breaks. In some cases core temperatures were measured at 104 to 105° F.

SPECIAL CONSIDERATIONS DURING PROLONGED HEAT SPELLS

During unusually hot weather conditions lasting longer than 2 days, the number of heat illnesses usually increases. This is due to several factors, such as progressive body fluid deficit, loss of appetite (and possible salt deficit), buildup of heat in living and work areas, and breakdown of air-conditioning equipment. Therefore, it is advisable to make a special effort to adhere rigorously to the above preventive measures during these extended hot spells and to avoid any unnecessary or unusual stressful activity. Sufficient sleep and good nutrition are important for maintaining a high level of heat tolerance. Workers who may be at a greater risk of heat illnesses are the obese, the chronically ill, and older individuals.

When feasible, the most stressful tasks should be performed during the cooler parts of the day (early morning or at night). Double shifts and overtime should be avoided whenever possible. Rest periods should be extended to alleviate the increase in the body heat load.

The consumption of alcoholic beverages during prolonged periods of heat can cause additional dehydration. Persons taking certain medications (e.g., medications for blood pressure control, diuretics, or water pills) should consult their physicians in order to determine if any side effects could occur during excessive heat exposure. Daily fluid intake must be sufficient to prevent significant weight loss during the workday and over the workweek.

SOURCES OF ADDITIONAL INFORMATION:

American Conference of Governmental Industrial Hygienists [1991]. TLVs. threshold limit values and biological exposure indices for 1985-86, Cincinnati OH: ACGIH pp. 91-98.

NIOSH [1986]. Criteria for a recommended standard - occupational exposure to hot environments - revised criteria. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 86-113.

NIOSH [1976]. Standards for occupational exposures to hot environments--proceedings of symposium. Cincinnati, OH: U.S. Department of Health, Education and Welfare, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, HEW(NIOSH) Publication No. 76-100.

Westinghouse Electric Corporation [1986]. Heat stress management program for nuclear power plants. University Park, PA: Pennsylvania State University, GPU Nuclear Corporation.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices. American Conference of Governmental Industrial Hygienists, Cincinnati Ohio, 1999.

Fundamentals of Industrial Hygiene, Fourth Edition, Barbara A. Plog, Jill Niland, Patricia J. Quinlan, National Safety Council, Itasca Illinois, 1995

Air Sampling Instruments, for Evaluation of Atmospheric Contaminants. Seventh Edition, Hering, Susanne, v., American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio, ACGIH Press, 1989.

Criteria for a Recommended Standard: Occupational Exposure to Hot Environments; Revised Criteria 1986, U.S. Department of Health and Human Services, Centers For Disease Control and Prevention, National Institute of Occupational Safety and Health, Publication No. 86-113.

Working in Hot Environments; Revised 1986, U.S. Department of Health and Human Services, Centers For Disease Control and Prevention, National Institute of Occupational Safety and Health, Publication No. 86-112.

APPENDIX G – WET BULB

WET BULB GLOBE TEMPERATURES

MEASUREMENT OF WET BULB GLOBE TEMPERATURE.

Measurement is often required of those environmental factors that most nearly correlate with deep body temperature and other physiological responses to heat. At the present time, the Wet Bulb Globe Temperature Index (WBGT) is the most used technique to measure these environmental factors. WBGT values are calculated by the following equations:

Indoor or Outdoor Wet Bulb Globe Temperature Indexes (WBGI) Indoor or outdoors with no solar load

$$WBGT = 0.7NWB + 0.3GT$$

Outdoors with solar load

$$WBGT = 0.7NWB + 0.2GT + 0.1DB$$

where: WBGT = Wet Bulb Globe Temperature Index
NWB = Natural Wet-Bulb Temperature
DB = Dry-Bulb (air) Temperature
GT = Globe Thermometer Temperature

The determination of WBGT requires the use of a black globe thermometer, a natural (static) wet-bulb thermometer, and a dry-bulb thermometer. The measurement of environmental factors shall be performed as follows:

1. The range of the dry and the natural wet-bulb thermometers should be -5°C to $+50^{\circ}\text{C}$, with an accuracy of $\pm 0.5^{\circ}\text{C}$. The dry bulb thermometer must be shielded from the sun and the other radiant surfaces of the environment without restricting the airflow around the bulb. The wick of the natural wet bulb thermometer should be kept wet with distilled water for at least one-half hour before the temperature reading is made. It is not enough to immerse the other end of the wick into a reservoir of distilled water and wait until the whole wick becomes wet by capillarity. The wick must be wetted by direct application of water from a syringe one-half hour before each reading. The wick must cover the bulb of the thermometer and an equal length of additional wick must cover the stem above the bulb. The wick should always be clean, and new wicks should be washed before using.
2. A globe thermometer, consisting of a 15 cm (6-inch) in diameter hollow copper sphere painted on the outside with a matte black finish, or equivalent, must be used. The bulb or sensor of a thermometer (range -5°C to $+100^{\circ}\text{C}$ with an accuracy of $\pm 0.5^{\circ}\text{C}$) must be fixed in the center of the sphere. The globe thermometer should be exposed at least 25

minutes before it is read.

3. A stand should be used to suspend the three thermometers so that they do not restrict free air flow around the bulbs and the wet-bulb and globe thermometer are not shaded.

4. It is permissible to use any other type of temperature sensor that gives a reading similar to that of a mercury thermometer under the same conditions.

5. The thermometers must be placed so that the readings are representative of the employee's work or rest areas, as appropriate.

Once the WBGT has been estimated, employers can estimate workers' metabolic heat load and use the ACGIH method to determine the appropriate work/rest regimen, clothing, and equipment to use to control the heat exposures of workers in their facilities.

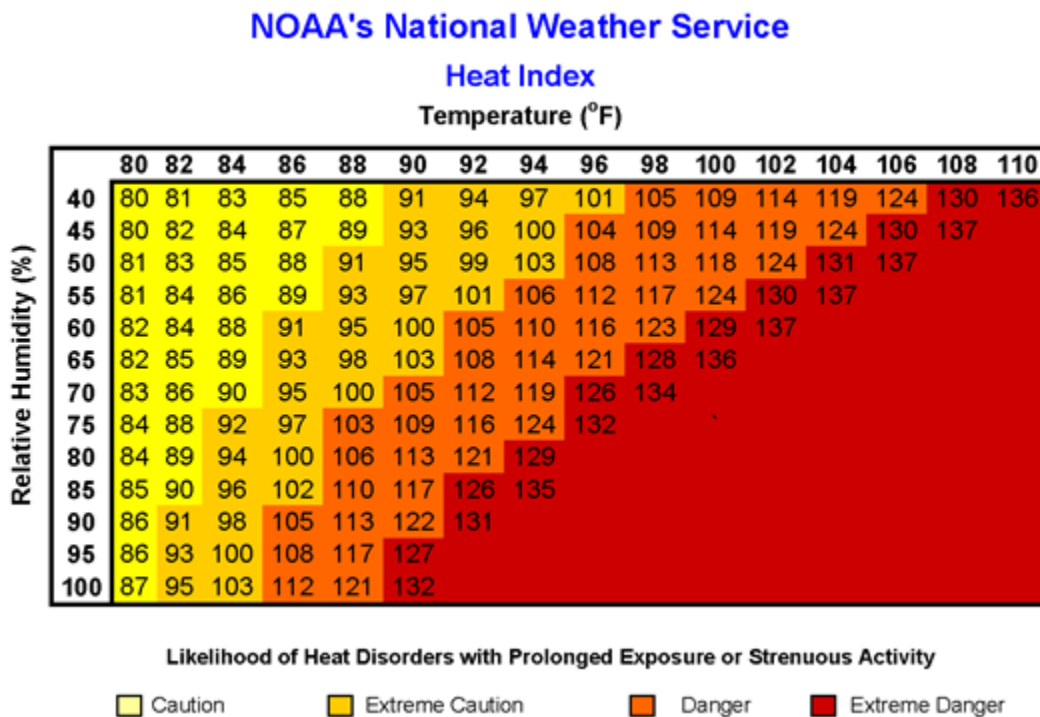
APPENDIX H – HEAT INDEX

The heat index (see chart below) is the "feels like", or apparent, temperature. As relative humidity increases, the air seems warmer than it actually is because the body is less able to cool itself via evaporation of perspiration.

As the heat index rises, so do health risks. When the heat index is 90°-105°F, heat exhaustion is possible. When it is above 105°F, it is probable. Heatstroke is possible when the heat index is above 105°F, and very likely when it is 130°F and above. Physical activity and prolonged exposure to the heat increase the risks.

NOTE: The heat index chart is designed with street clothes in mind. People wearing PPE will notice an increase in temperature inside the suits as the PPE level increases. Chemical resistant suits do not "breathe" and therefore trap heat inside. Temperature inside a chemical suit or encapsulated suit, in the sun, will equal globe temperatures and may exceed 140°F. These suits, like a car, can heat up very quickly.

National Oceanographic and Atmospheric Administration (NOAA) Heat Index Chart



APPENDIX I – OTHER RESOURCES

National Institute for Occupational Safety and Health (NIOSH)
Safety and Health Topic: Heat Stress

<http://www.cdc.gov/niosh/topics/heatstress/>

National Weather Service

<http://www.nws.noaa.gov/os/heat/index.shtml#heatindex>

Facebook Page:

<https://www.facebook.com/azdhs>

Twitter Account: @AZDHS

Extreme Weather and Public Health

<http://www.azdhs.gov/phs/oeh/heat/index.htm>

APPENDIX J – HEAT RESOURCE GUIDE

ADHS is working with several federal, state, local agencies and university partners on an Arizona Heat Safety Resource Guide. This guide is intended to list resources available throughout the state on heat safety such as locations and operations of cooling centers, refuge/hydration locations, heat index charts, excessive heat warnings and watches, information on vulnerable populations, interventions, and resources for obtaining heat-related mortality and morbidity data.

This guide provides critical information that local public health officials, partner organizations, public information officers and media would need to know in regards to heat safety. The projected completion of the Heat Resource Guide is mid-May 2014.