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## Outdoor Heat Exposure

WAC 296-62-095

*Division of Occupational Safety & Health  
Washington State Department of Labor and Industries*



April 2010

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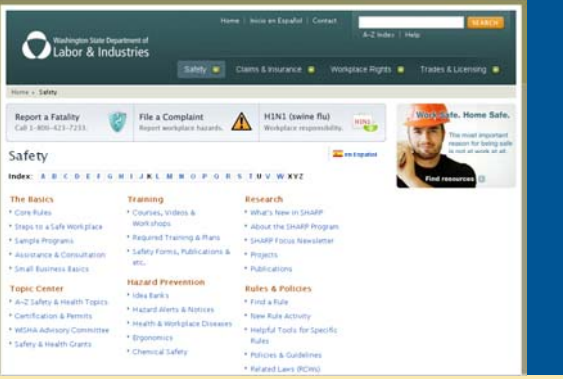


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## WAC 296-62-09510 Scope and Purpose

(1) WAC 296-62-095 through 296-62-09560

- Applies to all employers with employees performing work in an outdoor environment.



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## WAC 296-62-09510 Scope and Purpose

(2) The requirements of WAC 296-62-095 through 296-62-09560 apply to outdoor work environments

- from May 1 through September 30, annually,
- only when employees are exposed to outdoor heat at or above an applicable temperature listed in Table 1.

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**Table 1 Outdoor Temperature Action Levels**

- To determine which temperature applies to each worksite, select the temperature associated with the general type of clothing or personal protective equipment (PPE) each employee is required to wear.
- Note:** There is no requirement to maintain temperature records. The temperatures in Table 1 were developed based on Washington State data and are not applicable to other states.

All other clothing	89 degrees F
Double-layer woven clothes including coveralls, jackets and sweatshirts (Note: also regular rain gear)	77 degrees F
Non-breathing clothes including vapor barrier clothing or PPE such as chemical resistant suits	52 degrees F


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**WAC 296-62-09510 Scope and Purpose**

(3) WAC 296-62-095 through 296-62-09560 does not apply to incidental exposure which exists when an employee is not required to perform a work activity outdoors for more than fifteen minutes in any sixty minute period. This exception may be applied every hour during the work shift.

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**WAC 296-62-09510 Scope and Purpose**


(4) WAC 296-62-095 through 296-62-09560 supplement industry-specific standards with related requirements.

- Where the requirements under these sections provide more specific or greater protection than the industry-specific standards, the employer shall comply with the requirements under these sections.
- Additional related requirements are found in:
  - Chapter 296-305 WAC, Safety Standards for Firefighters
  - Chapter 296-307 WAC, Safety Standards for Agriculture


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**WAC 296-62-09520 Definitions**




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**(1) Acclimatization**

Means the body's temporary adaptation to work in heat that occurs as a person is exposed to it over time.



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**(2) Double-layer woven clothing**

Means clothing worn in two layers allowing air to reach the skin. For example, coveralls worn on top of regular work clothes.





### (3) *Drinking water*

- **Drinking water** means potable water that is suitable to drink.
- Drinking water packaged as a consumer product and electrolyte-replenishing beverages (i.e. sports drinks) that do not contain caffeine are acceptable.



### (4) *Engineering controls*

Means the use of devices to reduce exposure and aid cooling (e.g. air conditioning).



Photo from: Tim Rice, Safety Manager, EMJ Corporation



### (5) *Environmental factors for heat-related illness*

Means working conditions that increase the susceptibility for heat-related illness

These include:

- air temperature
- relative humidity
- radiant heat from the sun and other sources
- conductive heat sources such as the ground
- air movement
- workload severity (i.e. heavy, medium, or low) and duration
- personal protective equipment worn by employees

Measurement of environmental factors is not required by WAC 296-62-095.

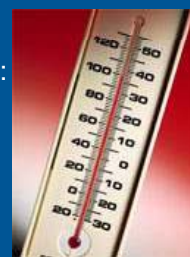


### (6) *Heat-related illness*

Means a medical condition resulting from the body's inability to cope with a particular heat load.

It includes, but is not limited to:

- heat cramps
- heat rash
- heat exhaustion
- fainting
- heat stroke



### (7) *Outdoor environment*

- Means an environment where work activities are conducted outside.
- Environments such as inside vehicle cabs, sheds, and tents or other temporary structures may be considered an outdoor environment if the environmental factors affecting temperature are not managed by engineering controls.
- Construction activity is considered work in an indoor environment when performed inside a structure after the outside walls and roof are erected.



### (8) *Vapor barrier clothing*

- Means clothing that significantly inhibits or completely prevents sweat produced by the body from evaporating into the outside air.
- Such clothing includes:
  - encapsulating suits
  - various forms of chemical resistant suits used for PPE
  - other forms of non-breathing clothing



### WAC 296-62-09530

#### Employer and Employee Responsibility

- (1) Employers having employees exposed to temperature conditions listed in WAC 296-62-09510(2) Table 1 must:
  - a) Address their outdoor heat exposure safety program in their written accident prevention program (APP) and
  - b) Encourage employees to frequently consume water or other acceptable beverages to ensure hydration.



### WAC 296-62-09530

#### Employer and Employee Responsibility

- (2) Employees are responsible for monitoring their own personal factors for heat-related illness including consumption of water or other acceptable beverages to ensure hydration.



### WAC 296-62-09540,

#### Drinking water



#### Drinking Water

- 1) Keeping workers hydrated in a hot outdoor environment requires that more water be provided than at other times of the year.  
Federal OSHA and research indicate that employers should be prepared to supply at least one quart of drinking water per employee per hour.



#### Drinking Water

- When employee exposure is at or above an applicable temperature listed in WAC 296-62-09510(2) Table 1:
- (a) Employers must ensure that a sufficient quantity of drinking water is readily accessible to employees at all times; and
  - (b) Employers must ensure that all employees have the opportunity to drink at least one quart of drinking water per hour.



### Drinking Water

- (2) Employers are not required to supply the entire quantity of drinking water needed to be supplied for all employees on a full shift at the beginning of the shift.

Employers may begin the shift with smaller quantities of drinking water if effective procedures are established for replenishment during the shift.



### WAC 296-62-09550

### Responding to signs and symptoms of heat-related illness



### Responding to signs and symptoms of heat-related illness

- (1) Employees showing signs or demonstrating symptoms of heat-related illness must be relieved from duty and provided with a sufficient means to reduce body temperature.
- (2) Employees showing signs or demonstrating symptoms of heat-related illness must be monitored to determine whether medical attention is necessary.



### WAC 296-62-09560

### Information and training



### Information and training

All training must be provided:

- To employees and supervisors
- In a language the employee or supervisor understands,
- Prior to outdoor work at or above the temperatures listed in WAC 296-62-09510(2) Table 1, and
- At least annually thereafter.



### Information and training

- (1) Employee training.

Training on the following topics must be provided to all employees who may be exposed to outdoor heat at or above the temperatures listed in WAC 296-62-09510(2) Table 1:



### Information and training for employees

- a) The environmental factors that contribute to the risk of heat-related illness;
- b) General awareness of personal factors that may increase susceptibility to heat-related illness including, but not limited to, an individual's age, degree of acclimatization, medical conditions, drinking water consumption, alcohol use, caffeine use, nicotine use, and use of medications that affect the body's responses to heat. This information is for the employee's personal use;



### Information and training for employees

- c) The importance of removing heat-retaining personal protective equipment such as non-breathable chemical resistant clothing during all breaks;
- d) The importance of frequent consumption of small quantities of drinking water or other acceptable beverages;
- e) The importance of acclimatization;



### Information and training for employees

- f) The different types of heat-related illness and the common signs and symptoms of heat-related illness; and
- g) The importance of immediately reporting signs or symptoms of heat-related illness in either themselves or in co-workers to the person in charge and the procedures the employee must follow including appropriate emergency response procedures.



### Information and training

#### (2) Supervisor training

Prior to supervising employees working in outdoor environments with heat exposure at or above the temperature levels listed in WAC 296-62-09510(2) Table 1, supervisors must have training on the following topics:



### Information and training for supervisors

- a) The information required to be provided in subsection (1) of this section;
- b) The procedures the supervisor must follow to implement the applicable provisions of WAC 296-62-095 through 296-62-09560;
- c) The procedures the supervisor must follow if an employee exhibits signs or symptoms consistent with possible heat-related illness, including appropriate emergency response procedures;
- d) Procedures for moving or transporting an employee(s) to a place where the employee(s) can be reached by an emergency medical service provider, if necessary.



### Quick Quiz – True or False

1. Cola drinks are the best way to hydrate when you are working outside.
2. Light colored clothing is better than dark when working in the sun.
3. Your medicine may make you more vulnerable to heat-related illness.
4. It is important to drink your water all at once.



## Training For All Employees

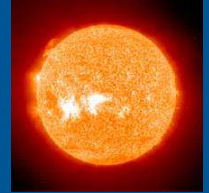


## Why is it important to know about and address outdoor heat exposure?

- Hot weather can cause mental and physical fatigue
- Extra care is needed when working and driving
- Heat exposure can cause heat-related illness under certain conditions

### Heat-related illness:

- Happens when the body is not able to cool itself and the body overheats
- Can cause injury, disability or death
- Is preventable



NASA



## Where does heat illness happen?

- Heat illness can affect anyone.
- It can happen in logging, construction projects, landscaping, agriculture, field work, transportation, etc.



## Environmental factors that contribute to the risk of heat-related illness



## Environmental Factors

### Direct sun, heat and humidity

More direct sun the greater the risk

### Limited air movement

Low or no wind



## Environmental Factors

### Hot equipment

Engines add more heat




### Heat reflected from ground or objects

Watch out for reflected heat



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### Environmental factors

#### Physical exertion

- What kind of work are you doing?
- How hard are you working?







Photo credit:  
[www.shutterstock.com.au/LawnMowing.html](http://www.shutterstock.com.au/LawnMowing.html)


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### Workload Activity

Categories	Example Activities
Resting	<ul style="list-style-type: none"> <li>• Sitting quietly</li> <li>• Sitting with moderate arm movement</li> </ul>
Light	<ul style="list-style-type: none"> <li>• Sitting with moderate arm and leg movements</li> <li>• Standing with light work at machine or bench while using mostly arms</li> <li>• Using a table saw</li> <li>• Standing with light work at machine or bench and some walking about</li> <li>• Driving a tractor (at times can be moderate)</li> </ul>

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Categories	Example Activities
Moderate	<ul style="list-style-type: none"> <li>• Scrubbing in a standing position</li> <li>• Walking about with moderate lifting or pushing</li> <li>• Walking on level at about 4 miles/hour while carrying a 6-7 pound weight load</li> </ul>
Heavy	<ul style="list-style-type: none"> <li>• Carpenter sawing by hand</li> <li>• Going up and down ladders</li> <li>• Chopping weeds</li> <li>• Heavy assembly work on a non-continuous basis</li> <li>• Intermittent heavy lifting with pushing or pulling (e.g. pick-and-shovel work)</li> </ul>
Very Heavy	<ul style="list-style-type: none"> <li>• Shoveling wet sand</li> <li>• Bucking hay bales</li> <li>• Hand chopping hops vines</li> </ul>

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### Environmental factors

#### Clothing and Personal Protective Equipment (PPE)


- Heavy clothing
- Multiple layers
- Dark colored clothing
- Protective Clothing
  - Vapor barrier clothing
  - Chemical resistant suits
- Respiratory Protection




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### Personal factors that may make you more susceptible to heat-related illness




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### Personal risk factors

- **Dehydration**
  - Failure to drink enough water can make you dehydrated
- **Loss of electrolytes**
  - When you sweat you lose electrolytes
  - Electrolytes are needed for your body to function
- **Illness/fever**



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### Personal risk factors

- Age, weight, and personal fitness
- Past heat-related illness
- Medical conditions
  - Heart conditions
  - Diabetes
  - Etc.
- Certain medications
  - See next slide




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### Some medications can make you more sensitive to the effects of heat.

- ✓ Allergy medicines (antihistamines)
- ✓ Cough and cold medicines
- ✓ Blood pressure and heart medicines
- ✓ Irritable bladder or bowel medicines
- ✓ Laxatives
- ✓ Mental health medicines
- ✓ Seizure medicines
- ✓ Thyroid pills
- ✓ Water pills (diuretics)

**A health care provider or pharmacist can tell you for sure.**




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### Personal risk factors

#### Diet

- Sugar added drinks
- Heavy foods
- Alcohol
- Hangover





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### Personal risk factors

- ✓ "I'm tough ~ I don't need a water break"
- ✓ "I'm not thirsty ~ I don't need to drink"
- ✓ "I'll lose pay if I take a water break"
- ✓ "I'll be letting my team down"
- ✓ "I'm new here ~ I need to prove myself"

**Don't fall for these beliefs – we want you healthy!**



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### Helpful tips for working in the heat – Work smart

- ✓ Have a "Buddy System" to keep an eye on co-workers for symptoms of heat illness such as crankiness and denial
- ✓ Increase breaks if:
  - Conditions are very hot; or
  - High exertion levels; or
  - Protective clothing limits evaporative cooling
- ✓ Alternate heavy work with light work when possible



✓ When possible, schedule the hardest work for the cooler parts of the day

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### Helpful tips for working in the heat - Work smart

- ✓ Work in the shade or out of direct sun when possible
- ✓ Avoid getting sunburned
- ✓ Wear proper clothing
  - ✓ Light colored
  - ✓ Light weight
  - ✓ Natural fibers
  - ✓ Hat with a brim
  - ✓ Cooling vest may be helpful in some cases.




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## Remove PPE and excess clothing during breaks

This is important to help you stay cool

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## Water

- It is important to drink small quantities of water throughout the day.
- One quart or more over the course of an hour may be necessary when the work environment is hot and you may be sweating more than usual as you work.
- Employers are responsible for encouraging water consumption.
- Employees are responsible to drink water



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## Proper hydration is key to preventing heat illness

**DO**

- ✓ Drink plenty of water
- ✓ Start work well hydrated
- ✓ Consider sports drinks for electrolyte replacement when sweating a lot



**AVOID**

- ✓ Drinking pop and other sugary drinks
- ✓ Drinking lots of coffee and tea
- ✓ Drinking alcohol
- ✓ Waiting for thirst before drinking water



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## Drinking water sources:

- Closeable & have tap
- Clearly marked
- Suitably cool (60 degrees Fahrenheit or less)
- Individual cups




## Other options:

- Bottled water
- Hydration packs ("camelbacks")

Lightweight bags carried on the back. Users sip water through a tube.




Hydration pack

Worker wearing hydration pack

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## Acclimatization

- When people are not used to being in the heat they need to adjust (acclimate) to hot working conditions over a few days.
- In severe heat, gradually build up exposure time especially if work is strenuous.
- Eastern WA workers experience more heat and are better acclimated.
- Western WA workers experience heat less often and do not have the opportunity to acclimate.



**Pay special attention to:**

- New employees
- People just back from being sick
- Anyone absent for more than 2 weeks
- People who have just moved from a cooler climate
- Everyone during heat wave events

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## Types of Heat Illnesses

There are five main kinds of heat illness:

- Heat rash – often under clothing
- Heat cramps – in arms or legs with physical labor. Can be caused by the loss of electrolytes from sweating.
- Fainting – can occur when person not used to heat
- Heat exhaustion – more serious effect
- Heat stroke – can be fatal




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## What are the most serious heat illnesses?

### Heat exhaustion and Heat stroke

Dehydration

➔

Heat Exhaustion


➔

Heat Stroke

Untreated **heat exhaustion** may progress to **heat stroke**. Symptoms of either should always be taken seriously

**Note:**  
Heat exhaustion or heat stroke may develop over a few days.


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## Heat-related illness: Signs, symptoms, and response

Illness	Signs and Symptoms	Response
Heat rash	<ul style="list-style-type: none"> <li>Red blister-like eruptions/bumps</li> <li>Itching (prickly sensation)</li> </ul>	<ul style="list-style-type: none"> <li>Rest in a cool place.</li> <li>Allow the skin to dry.</li> <li>Monitor for infection.</li> </ul>
Heat Cramps	<ul style="list-style-type: none"> <li>Painful spasms</li> <li>Abnormal body posture</li> <li>Grasping the affected area</li> </ul>	<ul style="list-style-type: none"> <li>Rest in a cool place.</li> <li>Drink water or a heavily diluted sports beverage (such as Gatorade).</li> <li>Seek medical attention if cramping is severe or does not go away.</li> </ul>


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## Heat exhaustion: Signs and symptoms

Illness	Signs and Symptoms
Heat exhaustion	<ul style="list-style-type: none"> <li>Headaches,</li> <li>Dizziness, light-headedness, or fainting</li> <li>Weakness,</li> <li>Mood changes, irritability or confusion</li> <li>Feeling sick to your stomach and/or vomiting</li> <li>Extreme sweating</li> <li>Decreased and dark-colored urine</li> <li>Pale clammy skin</li> </ul>

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## Heat exhaustion: Response

- Move the person to a cool, shaded area. Don't leave the person alone. If the person is dizzy or light-headed, lay him on his back and raise his legs about 6-8 inches. If the person is sick to his stomach, lay him on his side.
- Loosen and remove heavy clothing.
- Have the person drink some cool water (a small cup every 15 minutes) if he is not feeling sick to his stomach.
- Try to cool the person by fanning him. Cool the skin with a cool spray mist of water or wet cloth.
- If the person does not feel better in a few minutes call for emergency help (ambulance or 911.)

**If heat exhaustion is not treated, the illness may advance to heat stroke.**


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## Heat stroke: Signs and symptoms

Illness	Signs and Symptoms
Heat stroke	<ul style="list-style-type: none"> <li>Dry, pale skin,</li> <li>Sweating may still be present</li> <li>Nausea and vomiting</li> <li>Hot, red skin (looks like sunburn)</li> <li>Mood changes, irritability, confusion, and not making any sense</li> <li>Seizures or fits</li> <li>Collapse (will not respond)</li> <li>High temperature (104° F or higher)</li> </ul>

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## Heat Stroke or Heat Exhaustion?

### How do you tell the difference??

The telling difference is mental confusion/disorientation in ALL heat stroke victims.

You can ask these 3 questions.

- "What is your name?"
- "What day is this?"
- "Where are we?"

**If a worker can't answer these questions, assume it is heat stroke.**



### Heat stroke: Response - A Medical Emergency

#### Call for emergency help (ambulance or 911)

- Move the person to a cool, shaded area. Don't leave the person alone. Lay him on his back and if the person is having seizures, remove objects close to him so he won't hit them. If the person is sick to his stomach, lay him on his side.
- Remove heavy and outer clothing.
- Have the person drink small amounts of cool water if he is alert enough to drink anything and not feeling sick to his stomach.
- Try to cool the person by fanning him or her. Cool the skin with a cool spray mist of water, wet cloth, or wet sheet.
- If ice is available, place ice packs in armpits and groin area.



### Important!

Stop all activity if you become:

- ✓ Lightheaded
- ✓ Confused
- ✓ Weak
- ✓ Faint
- ✓ Or have a pounding heart or trouble breathing



**Tell the person in charge if you or one of your co-workers experience symptoms of heat-related illness.**



### How emergency medical services will be provided should they become necessary:

(Fill in your information below)



### Remember – to prevent heat illness:

- ✓ Drink water frequently !!
- ✓ Know the signs and symptoms of heat related illnesses and take them seriously
- ✓ Consider sports drinks when sweating a lot
- ✓ Avoid alcohol, caffeinated drinks, and heavy meals before or during work
- ✓ Work smart
- ✓ Acclimate
- ✓ Wear appropriate clothing
- ✓ Take regular breaks
- ✓ Keep an eye on your buddy!

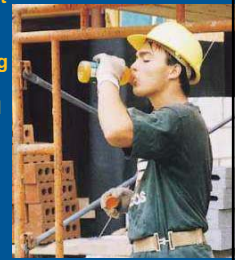


Photo credit: www.csao.org



### Information and training for supervisors

The procedures the supervisor is to follow to implement the applicable provisions in this section.

Procedures at our worksite are:

(Fill in your information below)



### Information and training for supervisors

The procedures the supervisor is to follow when an employee exhibits signs or symptoms consistent with possible heat-related illness, including emergency response procedures;

At our worksite we will:

(Fill in your information below)



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## Information and training for supervisors

Procedures for moving employees to a place where they can be reached by an emergency medical service provider, if necessary.

Our procedures are:  
**(Fill in your information below)**

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## Additional Resources




Washington State Department of Labor and Industries  
 Outdoor heat exposure resources  
<http://www.lni.wa.gov/safety/topics/atoz/heatstress/default.asp>

Washington State Department of Labor and Industries –  
 Video Library  
<http://www.lni.wa.gov/Safety/TrainTools/Videos/Library/>

- ✓ [Heat Stress: Don't Lose Your Cool](#) - Video ID: V0931
- ✓ [Working Safely in Hot Environments](#) - Video ID: V0955
- ✓ [Heat Stress Prevention](#) - Video ID: V0092
- ✓ [Heat Stress](#) - Video ID: V0358

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## Additional Help

### Contact L&I Consultants

- You can call one of our industrial hygiene or safety consultants for additional assistance in evaluating your workplace for heat-related illness hazards.
- This is a confidential, free service not connected to regulatory inspections.

Click below for local L&I office locations:  
<http://www.lni.wa.gov/Safety/Basics/Assistance/Consultation/consultants.asp>

Phone numbers can be found on the next slide.

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## Contact L&I Consultants

**Region 1: 425-290-1431**  
 Island, San Juan, Skagit, Snohomish, and Whatcom counties

❖ **Region 2: 206-515-2837 or 206-835-1146**  
 King County

❖ **Region 3: 253-596-3917**  
 Clallam, Jefferson, Kitsap, and Pierce counties

❖ **Region 4: 360-902-5472**  
 Clark, Cowlitz, Grays Harbor, Klickitat, Lewis, Mason, Pacific, Skamania, Thurston, and Wahkiakum counties

❖ **Region 5: 509-886-6570**  
 Adams (west county), Benton, Chelan, Columbia, Douglas, Franklin, Grant, Kittitas, Okanogan, Walla Walla, and Yakima counties

❖ **Region 6: 509-324-2543**  
 Adams (east county), Asotin, Ferry, Garfield, Lincoln, Pend, Onelle, Spokane, Stevens, and Whitman counties

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## Questions?

