



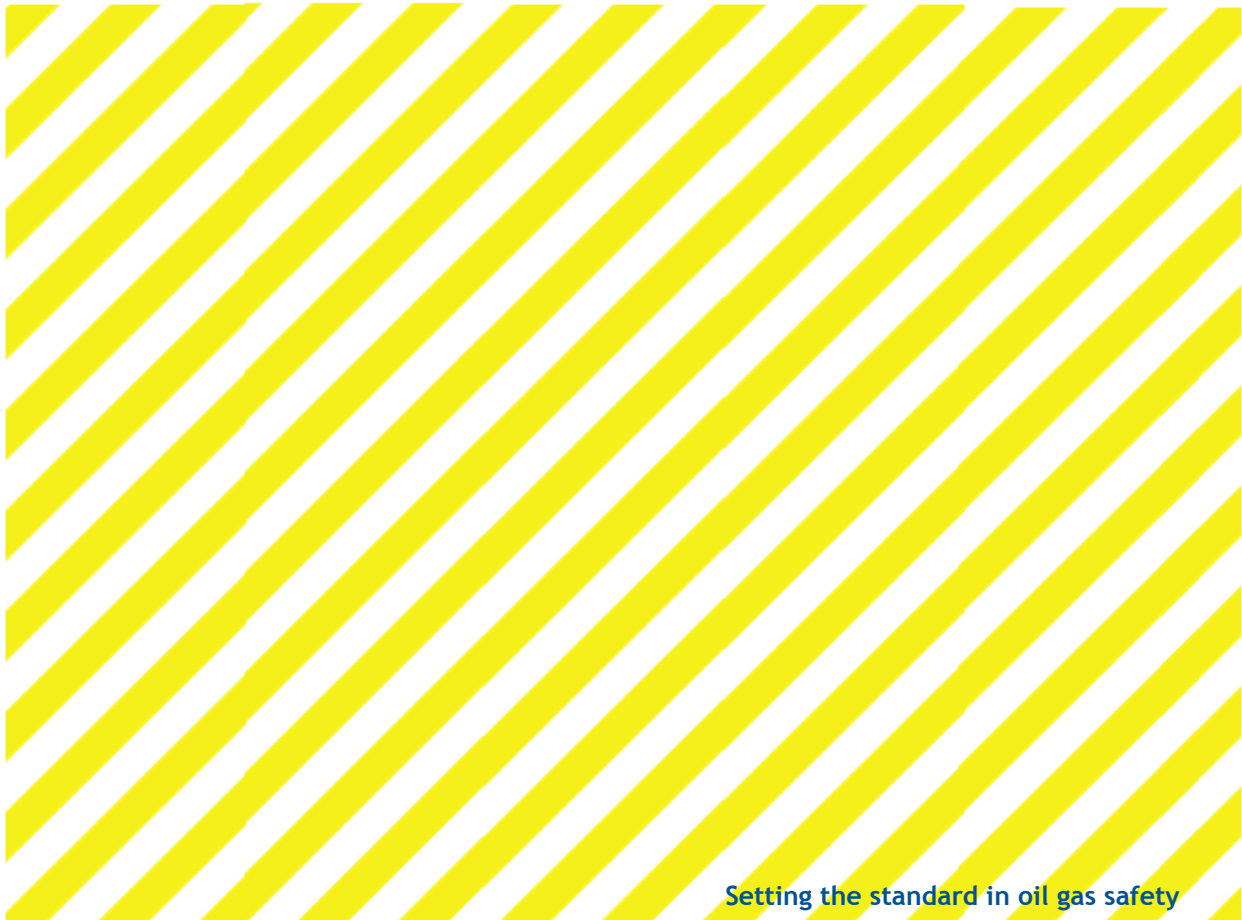
BEAR AWARENESS

A Program Development Guideline

EDITION » 2

REVISED » August 24, 2018

RELEASE DATE » November 21, 2016



ACKNOWLEDGEMENT

This document was developed by Energy Safety Canada with the support of industry. Energy Safety Canada gratefully acknowledges the many individuals who volunteered their time and effort on behalf of:

- Canadian Association of Geophysical Contractors (CAGC)
- Canadian Association of Oilwell Drilling Contractors (CAODC)
- Canadian Association of Petroleum Producers (CAPP)
- Canadian Energy Pipeline Association (CEPA)
- Explorers and Producers Association of Canada (EPAC)
- Petroleum Services Association of Canada (PSAC)

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PREFACE

PURPOSE

The purpose of this guideline is to serve as an aid to employers who wish to optimize efforts to protect their personnel in the field who may be exposed to injury or property damage by interactions with bears. In addition, this guideline serves to assist project managers and supervisors tasked with developing and implementing effective controls to adequately manage the risk of bears that may appear at the worksite. This guideline suggests a methodology to categorize the overall risk an encounter with bear may present. It also suggests appropriate response for each encounter risk level. The expected outcome is to ultimately preserve the lives of bears and workers alike.

PROJECT SCOPE AND LIMITATIONS

Energy Safety Canada (ESC) offers this guideline with no specific guarantee or warranty stated or implied. Bear behavior cannot be predicted with absolute certainty. As such, ESC cannot declare that workers who follow this guideline will not have injuries, property damage or other negative outcomes.

CONTRIBUTORS

This document incorporates information from the Canadian Association of Geophysical Contractors (CAGC)'s Bear Hazard Response Guideline. It also uses information from ESC's Bear Awareness course.

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1.0 Roles and Responsibilities

This document is not designed to interpret Canadian federal and provincial legislation. For more detail, please refer to applicable legislation for the jurisdiction where the work is being carried out.

This section discusses the general responsibilities of the prime contractor, employer and workers. It addresses who will contribute to the planning for bear management.

1.1 Prime Contractor

The client or owner is the prime contractor unless the authority is otherwise assigned, in writing, to a qualified party.

The prime contractor is responsible for establishing and maintaining a system or process that will ensure compliance with all applicable regulations. As the prime contractor is charged with the overall responsibility for the health and safety of all workers at the worksite, the prime contractor must ensure contractors and employers comply with applicable legislation.

Prime contractor responsibilities include:

- Ensuring the applicable Occupational Health and Safety Act and regulations, as well as wildlife-related acts, are complied with at the worksite
- Create a system or process that ensures compliance with the OHS legislation - each work site party is responsible for complying with all the rules of the OHS legislation that apply to them,
- Identifying and assessing risk
- Communicating the plan to all workers on site
- Coordinating with sub-contractors
- Maintaining the prime contractor's own work activities to ensure, as far as is reasonably practicable to do so, that no person is exposed to uncontrolled hazards at the work site
- Ensure that owners, employers, suppliers, service providers or self-employed persons are informed of any existing or potential hazards on the work site
- Establish a joint work site health and safety committee (HSC) if the work site has 20 or more workers or a health and safety (HS) representative if the work site has 5-19 workers,
- Consult and cooperate with HSC or the HS representative if there is one, to attempt to resolve health and safety issues,
- Meet with the health and safety representative (if any) regularly to discuss health and safety matters,

- Coordinate health and safety programs of the multiple employers and/or self-employed persons at the work site
- Cooperate with any other person exercising a duty under the legislation,
- Ensure that the required first aid services, equipment and supplies are available at the work site,
- Report injuries and incidents to OHS,
- Investigate injuries and incidents and prepare a report.
- Controlling bears using the lowest risk method practicable
- Initiating and implementing a plan for mitigating risk from bears

Note: Supervisors share the responsibility of complying with legislation in conjunction with any others who may direct workers.

1.2 Employer

Employer responsibilities include:

- Developing work processes that ensure compliance with this guideline
- Providing adequate supervision and ensuring active supervision occurs
- Ensuring the level of disturbance created on a project does not unnecessarily expose worker to risk from bears
- Conducting a site-specific hazard assessment to identify all dangers associated with bears in the area
- Implementing a hierarchy of controls for elimination or control of bear hazards
- Providing appropriate food storage facilities and systems
- Providing appropriate garbage storage and disposal facilities and systems
- Checking with authorities to see if animals are in the area (i.e. bear)
- Monitoring animals in the area for signs of habituation
- Reporting bear sightings to authorities
- Reporting problem bears to authorities
- Working with authorities to deal with problem bears
- Working to improve food and garbage storage and disposal to prevent habituation
- Every employer shall ensure that workers are adequately trained in all matters necessary to protect their health and safety
- Communicating potential bear hazards to workers
- Communicating the presence of bears to workers, especially problem bears
- Abiding by applicable regulations
- Acting in a manner that ensures the safety and protection of both workers and bears

1.3 Workers

Worker responsibilities include:

- Being aware of personal food storage practices
- Using the food and garbage facilities and systems provided
- Taking bear training
- Assisting in identifying hazards and implementing hazard controls
- Reporting problem bears to supervisors
- Reporting bear encounters to supervisors
- Warning co-workers of the presence of problem bears
- Abiding by applicable regulations
- Following established industry practices and safe work procedures
- Acting in a manner that ensures the safety and protection of both workers and bears

Worker rights include:

Right to Refuse

- Right to refuse work that he/she believes is unsafe

For example: you refuse to work in an area where a bear has been recently sighted

Right to Know

- Right to know hazards

For example: your next job is in grizzly territory and your employer provides trail reports

Right to Participate

- Right to participate in identifying and correcting job safety hazards

For example: you report a bull elk in the area to your supervisor

2.0 Planning for Working Around Bears

Employers must be prepared before beginning work in any area where wildlife, including bears, is present. Certain elements should be considered:

- Species present in the area
- Protection status of species
- Likelihood of an encounter
- Risk of an encounter
- Time of day most likely to encounter species
- Time of year most likely to encounter species (seasonality - what's the most dangerous time of year?
e.g. breeding season, with young, etc.)
- Species territory requirements (e.g. large vs. small, territorial, defensive, etc.)
- Potential hazards presented by bears in the area
- Plan for controlling food storage
- Plan for controlling garbage storage and disposal
- Communicating bear hazards to workers
- Bear spray required if working in bear country; must be carried on person to be able to be used if an encounter occurs
- Recommended actions if encounter occurs
- Reporting encounters
- Working alone
- ERPs (Emergency Response Procedures)

Much of this planning may be covered by a company's health and safety program. However, it is important to consider specific issues related to working around wildlife, and specifically bears, in order to avoid encounters. Companies may not need to create a stand-alone bear or wildlife management plan. Risks posed by bears and other wildlife may be addressed through hazard assessments for site specific work, or regional wildlife strategies.

Consider whether the information in this guideline is already covered in your company's plans. If not, the following topics may fit well into a site-specific orientation or hazard assessment.

2.1 Training Workers

Workers may be more prepared to work safely around bears if they have been trained in how to avoid bear encounters, and what to do in case of an encounter. Several training options are available, or a company can create its own training program, depending on its needs and the location where it will be working.

2.2 Communicating Bear Hazards

Planning for working around bears should address communicating bear hazards to workers. Workers must be prepared before starting work in the wilderness. Employers can communicate bear hazards via signage, safety meetings, posters, and safety alerts, among other means.

2.3 Emergency Response Procedures (ERPs)

Plans for working around bears should include emergency response procedures specific to bear encounters. ERPs depend on site location, type of work and type of wildlife involved. Employers must have a plan for bear encounters and when workers are injured or incapacitated in the event of a bear encounter.

In relation to bear encounters the plan should identify what structures or vehicles on site should be used to seek shelter from a bear. This plan should also identify the process to safely shut down activities. For example, how to safely stop pumping on a hydraulic fracturing site when a bear enters the worksite.

2.4 Avoiding Bear Encounters

It is impossible to predict bear behaviour in the event of an encounter, so it is critically important to identify the means to avoid bear encounters before an occurrence.

2.4.1 Avoiding Habituation and Food-Conditioning

Habituation occurs when bears lose avoidance and escape responses - essentially, when animals get used to human presence. This is a result of frequent, harmless interactions with humans. Attraction can lead to habituation. Subsequently, food-conditioned animals are ones that associate humans with food due to poorly managed food and garbage storage.

Food-conditioned animals are problematic, especially in camp situations. They may enter camp searching for food. It is crucial to manage food/garbage storage to avoid attracting animals and potentially causing food-conditioning. It is especially important to avoid food-conditioning because animals protecting or fighting for a food source are more dangerous.

Food-conditioned animals can become nuisance animals. Nuisance animals may end up being relocated or even destroyed by authorities. Relocation is often ineffective, so nuisance animals are often a direct victim of human impact on their habitats. Protect the bears in your area by avoiding food-conditioning and leaving as little trace as possible. It is more effective to focus on prevention.

Every animal needs its own personal space. That distance is different for every animal. Habituated animals may have a smaller personal space requirement than others. In interacting with bears, stay far enough away that the animal does not show a reaction. Even if the animal seems unaffected by your presence, it may be experiencing stress due to human presence but not outwardly showing it.

2.4.2 Controlling Food and Garbage Storage and Disposal

Controlling food and garbage onsite will minimize human impact and help avoid habituation. Bear resistant food containers are available for small backcountry camps. At larger camps, food must be stored indoors. Garbage and its disposal must also be carefully controlled. Employers are responsible for providing bear safe garbage bins for use around site. It is also crucial to dispose of garbage before it accumulates past the bins' capacities. A disposal schedule must be considered, according to the number of people in the camp. Garbage should be packed out, not burned or buried.

Workers must take personal responsibility for their own actions to avoid habituation. They must store food carefully and commit to using bear safe garbage bins. Note that food smells also attract bears. Both workers and employers are responsible to do their part in avoiding habituation of bears and other wildlife.

For worksites with no perimeter fencing, disposal of waste food, containers, wrappers, or disposable utensils must be in secured buildings or bear proof containers with automatically closing lids. Once a day before dusk, garbage must be transferred to a bear proof garbage containment area.

For camps or work area parking lots with no perimeter fencing, no waste can be disposed or stored. Signage must be posted in parking lots to indicate that all waste and litter must be taken to waste disposal container locations.

Garbage receptacles must be disinfected with lime daily, in order to reduce attractants. Odour control and pumping out open grey water is also required. Eating in tents is not permitted, nor are open fires for cooking.

2.4.3 Fencing Requirements

Industrial camps should follow certain safe practices to deter bears. This includes leaving space for bears and other wildlife.

Long-term industrial camps, such as logging camps, should have garbage, waste water, cooking facilities, incinerators and accommodations enclosed by a 6-foot chain link fence with three strands of barbed wire on top, surrounded by a four-strand electric fence controlled with electric gate access.

Other long-term plants like some gas processing plants do not have camp or cooking facilities onsite. Chain link fencing should suffice in those cases; however, fencing should be adjusted with increased risk.

Short-term industrial camps, such as drilling camps, should have all garbage, waste water, cooking facilities, incinerators and accommodations enclosed by a seven-strand galvanized steel wire electrified fence OR six-foot chain link fence with three strands of barbed wire on top, surrounded by a four-strand electric fence controlled with electric gate access.

Short-term temporary camps, such as drilling and tree planting camps, with a duration of less than three months, should have all garbage, waste water, cooking facilities, incinerators and accommodations enclosed by a four-strand electric fence controlled with electric gate access.

A cleared area extending at least 2.5 m from the outside of the fence is required. This cleared area, free of brush, allows bears to see and inspect the fence instead of stumbling into it. Bear-proof containment of grey water locations must be enclosed, and bear-proof garbage bins and containers must be provided at the camp. Large bear-proof garbage containment receptacles must be located 1 km from the camp.

3.0 Preparing a Bear Management Plan

When bears are a hazard in an area, it is necessary to prepare a Bear Management Plan. Note that such a plan may work in conjunction with the company's safety program. It should be prepared before any workers are on site, beginning with an initial task-based risk assessment for all phases of the project. The end goal is to provide a site-specific bear management plan that documents all the controls that will be used.

Risk management variables to define include:

- **Bear Populations:** Ask local Fish & Wildlife authorities about the bear population in the area. Have any been sighted recently?
- **Seasonality:** Within each species' life cycle, is the work occurring at times when bears will be hunting, foraging, breeding or raising young?
- **Terrain Assessment:** Is there a water source nearby? Food sources (berries)? Potential denning sites?
- **Available Prevention Resources:** Deterrents (electric fencing, bear-proof waste containers, noise makers, etc.) present? Lighting adequate?
- **Define Scope of Work:** Who is doing the work? What work will be performed? When will the work proceed? Where is the work underway?

Once the nature of the work has been defined, key definitions must be established regarding risk tolerance.

Clear site definitions must be documented and understood by everyone on site.

- **Working Alone:** What protections will be used if working alone is unavoidable? Are there any radio dead zones? What are appropriate check-in intervals?
- **Imminent Danger:** A danger that is not normal to that occupation OR a danger under which a person engaged in that occupation would not normally carry out the person's work (Part 4, Alberta Bill 30) Workers can refuse work if they feel they are in imminent danger.

Imminent Danger Example:

A worker performing tasks in a field where a buried carcass was found, indicating the presence of a grizzly bear in the area, would fall under the category of imminent danger because that level of danger would not be normal for that occupation. In this case, the worker could refuse work.

- **Immediate Peril:** When a worker is in danger of losing his/her life and must fight to survive. It is crucial to understand that bear spray is proven to be much more effective than firearms in a bear encounter. In addition, only government agencies, such as provincial Fish and Wildlife, have the authority to permit a bear to be killed.

Immediate Peril Example:

If a worker employs all appropriate strategies to calm down a defensive bear, and the bear continues to bluff charge or charge, then the worker may escalate his/her response in turn, by using deterrent and any other weapons in order to save his/her life. In the same way, if a bear stalks a worker and begins a predatory attack, then the worker can defend his or her life, potentially at the bear's expense.

Note: These variables will have to be taken into account as client requirements for each project. For example, some clients do not allow firearms on site for use by workers and subcontractors, regardless of the immediate peril definition established. Thus, the precautions need to be adjusted accordingly to ensure that worker safety is maximized while balancing the survival rights of both bears and workers.

- **Adequate Egress:** Each site should define its own tolerance for areas where safe exit may be restricted, such as marshy areas.
- **Risk Tolerances:** The site should document in the hazard assessment the point at which the following occur:
 - When to hire a bear monitor and how many are needed? A bear monitor is someone who is solely dedicated to monitor for bears and is equipped and trained to use bear deterrents.
 - At what point will work be shut down because of a high risk of an encounter?
 - In camp settings, how many bear encounters does it take for them to be considered “Frequent” versus “Occasional”?
 - At what point should workers work in groups instead of alone?
- **Shutdown Activities:** Each company in conjunction with the prime contractor should have procedures in place to safely shut down activities when a bear encounter is occurring and identify alternate muster points where workers can safely shelter such as vehicles, equipment, etc.

4.0 Working Around Bears

This section provides information on bears, in order to better understand and predict bear behaviour.

4.1 Bear Stress Signs

Animals are more predictable than you think. If a human is encroaching on a bear's personal space, it is likely to show signs of stress, which may increase the likelihood of an encounter.

Look out for the following stress signs. More species-specific stress signs are discussed in depth in the following sections. If you notice a bear exhibiting signs of stress, give it more space. Look for an avenue of escape in case the encounter escalates.

Remember to keep 10 bus lengths between you and a carnivore at all times.

Body language that indicates stress:

- Raised head (carnivores)
- Raised hair on shoulders and back of neck
- Licking lips
- Ears back
- Pawing/stomping the ground
- Blowing air out through nose
- Huffing noises

4.1.1 Bluff Charges

Sometimes bears escalate from showing stress signs to exhibiting perceived aggression by charging towards humans who are present. Such charges are meant to scare the human away and are called bluff or warning charges.

Bear behaviour when bluff charging may include:

- Charging towards you
- Clacking jaws
- Stomping and pouncing, landing on front paws
- Ears back

Animals may charge to protect young or a food source or territory. Whatever the reason, experiencing a bluff charge means you are too close to the bear in question.

In the event of a charge:

- Prepare pepper spray for use (90-foot guideline - if the bear is within 90 feet, pepper spray should be unholstered and readied for deployment)
- Stand your ground
- Do not do anything to further alarm the animal
- Move to find shelter if practical, such as in a vehicle or building

Ideally, do not put yourself in a position where a charge may occur. Pay attention to stress signs in order to minimize the likelihood of an encounter.

4.2 Example Encounters

The oil and gas industry has a history of bear encounters. Read the following Energy Safety Canada Safety Alerts for more information:

- Two Injured in Encounter with Black Bear (2014)
- Bear Mauling - Fatal Incident (2003)

4.3 Bear Information

There are three types of bears in North America: black bears, grizzly bears and polar bears.

4.3.1 Black Bears

Black bears are found in heavily wooded areas and dense bush. Their habitat often overlaps with grizzly bears.

Black bears are thickset, with a black coat and a lighter muzzle. They have small eyes and a tapered Roman nose. Their ears are rounded, and bigger than those of a grizzly. Black bears have short claws that are not retractable. They may have a white patch below the throat.



Coat colour may vary. Other colours include brown, dark brown, cinnamon and blonde. The Kermode, or spirit bear, has a white coat. The Blue Glacier bear carries a bluish-grey coat. Both are rare.

Black bears have excellent hearing and a keen sense of smell. If startled, a bear might stand on its hind legs to try to identify a new odour. It might also run to get downwind.

Black bears are solitary, but the bond between mother and cubs is extremely strong. Mothers are very protective of cubs.

Although they are mainly vegetarian (feeding on berries, fruit, and nuts), black bears will eat almost anything, including insects, fish, and sometimes small mammals or young ungulates. Bears drink frequently and are often found at sources of fresh water throughout the year.

Note: Black bears are fast (can run up to 55 km per hour) and climb well. Black bears often climb trees if they feel threatened. Do not climb a tree to get away from a bear. It is certainly a faster climber than you are.

In the wilderness, black bears are active from dawn to dusk. Closer to human settlements, bears are often nocturnal to avoid contact.

Black bears mate from June to July, and search for a den in the fall (dens are found in stumps, holes, culverts, pipes, etc.). Females line their dens with leaves, grass and ferns. Males do not. Females den earlier, while males wait until after the first snow. Black bears do not truly hibernate. Their heart rate drops, but they may wake in the middle of the winter and wander about in mild weather.

Cubs are usually born in the spring. Black bears begin to eat to gain weight in July, in order to prepare for the winter.

4.3.2 Grizzly Bears

Grizzly bears live in dense forest and subalpine areas. Their range can overlap with other bears. Grizzly habitat has been compromised and diminished greatly due to the expansion of human activities.

Grizzly bears look distinctly different from black bears. They have a large head, small eyes, and a nose that turns upward so it shows a bit of a dip between brow and nose. Grizzlies have smaller ears than black bears.



Grizzly bears, like polar bears, have a hump of muscle over their shoulders. The coat is lighter on the head and shoulders with a dark body and darker feet and legs.

Note: Grizzly bears have long, non-retractable front claws (10+ cm). This means grizzly and black bear tracks are very different. The claws leave marks much further from the toe pads, when compared with the short claws of the black bear.

Coastal bears that eat salmon are larger, with inland bears about 100 kg lighter on average. Grizzlies are solitary and occupy a large home range.

Although classified as carnivores, 80 - 90 percent of grizzly bear diet is vegetation, especially berries. Grizzlies that live in the mountains tend to den at high elevations, and then head down into valleys in the spring where vegetation is more available. However, grizzlies do prey on mammals using their excellent sense of smell.

Grizzly bears are good swimmers and fast runners. Although they climb less than black bears, grizzly bears can certainly climb trees. Do not climb a tree to escape any bear.

Mating occurs in May to June. Similar to black bears, females den first around November. Males wait until December. Two cubs are born in January or February and emerge in April or May with the mother. Grizzly bears are extremely protective mothers.

Like black bears, grizzly bears are not true hibernators and may be active throughout mild winters.

4.3.3 Polar Bears

This guideline offers a basic outline of polar bear characteristics and behaviour. For more detailed polar bear safety information, please visit the Parks Canada website.

Polar bears live in the Arctic and prefer ice all year round. They use ice as a hunting platform. However, warm weather forces them on shore for two to four months depending on location.

Unlike black and grizzly bears, polar bears do not enter a state of quasi-hibernation for months at a time. Only pregnant females remain in dens throughout the winter, beginning in mid-October. Instead, they remain inactive, slow their metabolism and heart rate, and live off their fat stores after 7 - 10 days of not eating.

Polar bears have a white coat and black skin, with long outer guard hairs and a thick undercoat for warmth. Like grizzlies, polar bears have a shoulder hump. Polar bears are massive, with males reaching 400 - 800 kg and females 150 - 250 kg.



Polar bears hunt by smell, and can locate their main prey, seal, from far away. Polar bears will also scavenge and eat carrion, as well as hunting walrus and beluga on occasion.

Polar bears are extremely protective of young. It is crucial to avoid maternity dens. One of the largest sites for maternity denning is Churchill, Manitoba. Dens are often built of snow on south-facing slopes.

The Arctic does not provide much cover, so it is important to maintain a safe distance from polar bears. Scan the area at regular intervals with binoculars. Watch for tracks, droppings, diggings, carcasses and maternity or temporary dens. Be careful around the coast, where dens can be hidden behind boulders, ice, driftwood or vegetation.

Travel only in daylight for best visibility. Travel in groups when possible, as large as possible for the best chance at deterrence.

Avoid areas inhabited by the ringed seal, which is the polar bear's primary food source. Bears hunt from ice floes, except when they spend time on the coast during the summer. Watch for dens throughout the year, since polar bears can den at any time. Keep an eye out for tracks leading to and from a den site.

4.4 Bear Behaviour

Bears behave differently based on the situation. It is important to understand and read bear behaviour to determine your appropriate response.

A threatened or defensive bear (either way, feeling stressed due to human presence) will chomp its teeth, huff, make vocalizations, and potentially bluff charge. It might also stand up on its hind legs to sniff the air to find out who and what you are, or sway its head back and forth. Defensive bears may yawn or pop their teeth.

A bear that is testing dominance will approach confidently.

A bluff charge will happen quickly and then subside, accompanied with vocalizations. A bluff charge lets you know that you are in the bear's critical space and it is time to leave.

If a bear is startled and its senses are compromised (i.e. while it is eating) it may strike out without warning. If feeding on a carcass, a bear will be concerned about protecting its food from other bears, and might initiate that preconditioned attack if startled.

A predatory bear will stalk its prey silently, moving slowly with ears erect, until it charges.

The Alberta Government released the Black Bear Response Guide in April 2016. This guide categorizes bears according to behaviour. The definitions below are taken from that Guide and will be used throughout this document. These definitions help clarify what type of bear you are dealing with. Please see the document for complete detail.

- **Habituated bear:** shows little or no perceived reaction to people; presence could be interpreted as or lead to a public safety risk; may frequent developed areas or areas of high human use; use preventative actions on these bears
- **Food-conditioned bear:** has learned to associate people and human activities with food; regularly uses unnatural food materials (garbage, pet food, etc.) that has been reasonably secured; is considered an imminent public safety risk
- **Depredation bear:** has attacked, killed, or is an immediate threat to a pet or livestock animal
- **Offender bear:** presents an apparent threat to human safety or has had contact with, injured, or killed a human after being provoked; may not always require capture (e.g. defensive response and short contact with human)
- **Predator bear:** has killed a human and either fed upon or concealed the body; or has stalked, pursued, chased or ambushed a human (unprovoked) resulting in contact, whether or not the victim was killed or injured

5.0 Responding to Bears

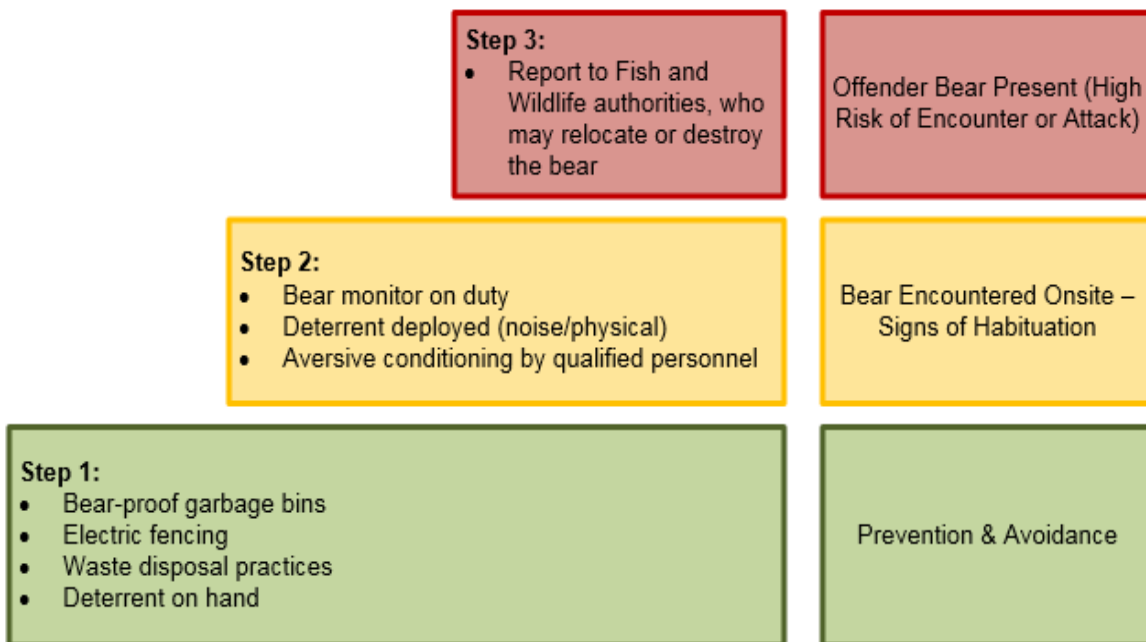
5.1 Camp Vs. Field: Situation, Mitigations and Responses

Situations, mitigations and responses change from camp to field settings.

5.1.1 Camp Mitigation

The camp mitigation staircase below shows how mitigation changes with increased risk of an encounter or with the presence of a nuisance bear.

Note: Step 1 mitigations continue throughout - escalating mitigations means building on what was there already.



5.1.2 Camp Situation and Response

At camp, a bear encounter might involve a worker observing a bear sniffing around the garbage bins. In this case, the recommended action would be to retreat indoors and report the incident to the supervisor, who would in turn report it to the local Fish and Wildlife authorities.

If the bear came to camp repeatedly in search of food, then Step 2 mitigation would occur. If necessary (e.g. defensive attack, predatory attack, etc.) then Step 3 mitigation would be initiated.

Camp attacks do occur in the oil and gas industry. An example would be a worker walking from one camp building to another and being stalked and attacked by a predatory bear. In this case, immediate deployment of bear spray and/or weapons by the worker and his/her co-workers in order to save the worker's life is warranted.

5.1.3 Field Mitigations, Situations and Response

Field mitigations rely on workers being properly equipped, trained and aware of bear behaviour. Workers must be trained in bear awareness and best practices for encounters. Workers must also be provided with and carry bear spray in case of a bear encounter.

Note: The Spectrum of Bear Engagement - Field, on pages 21 - 22, outlines situations and recommended responses for encounters and attacks.

5.2 Bear Deterrence

Note: Bear spray is not a true deterrent. It is the last line of defence to be used only in emergency situations. Using bear spray is effective and preferable to contact. The time between a charge and contact can be less than a second, so deploying bear spray should be an automatic reaction in all cases. Remember to unholster and prepare bear spray if a bear is within 90 feet of your position.

Bear spray should be stored at room temperature and usually lasts two years. For most workers, bear spray is the only deterrent you will use. Other types of deterrents are described here, but require a permit. Leave those techniques to the professionals. As discussed earlier, deterrence can include electric fencing in camp settings. If bears become habituated, qualified personnel may be brought in to conduct aversive noise conditioning, another form of deterrence.

This means noises are used to create negative experiences for the bear every time it comes to camp, with the end goal of dissuading the bear from hanging out there.

Companies must report nuisance bears that will not be deterred. Authorities like Fish and Wildlife will then capture and relocate the bear. If relocation does not work, or the bear becomes a nuisance bear in another location, the bear may have to be destroyed (by authorities only).

Other deterrents are used in the field. Deterrents may be physical or noise deterrents. Physical deterrents are designed to deter, not injure, bears. Physical deterrents include bean bag rounds or rubber slugs. Physical deterrents should only be deployed by trained professionals.

Noise deterrents create a negative experience without harm or injury to the bear. Noise deterrents include pen launchers, bear bangers, screamers, 12-gauge crackers and 12-gauge whistle crackers. All of these are launched from a device, launcher or shotgun. Once launched, the deterrent travels through the air and then

explodes with a unique sound, depending on the design of the deterrent. These noise deterrents require training and cannot be used where a risk of a flash fire or explosion may exist from oil and gas exploration and production activities.

Improper use of deterrents can cause injury or property damage. Do not use screamers in dry forest conditions. Pyrotechnic deterrents should only be shot into clear air and are not meant to contact the bear, ground, or anything else. If used properly there is no danger of ricochet. Use of non-lethal projectiles should be restricted to trained professionals.

In the event of an encounter, a worker may deploy pepper spray. The Spectrum of Bear Engagement details when to deploy pepper spray in the field. Use of deterrents around camp may require a trained professional.

5.3 Responding to a Bear Encounter

If you come upon a bear and it is **unaware of your presence**:

- Ready bear spray if available
- Discreetly leave the way you came
- Double back
- Keep your eyes on the bear (back away)
- Give a wide berth
- Choose route with no other bears
- Make your presence known once you have backed 300 meters away (talk loudly, sing, etc.)
- Keep moving

If you come upon a bear and it is **aware of your presence**:

- Ready bear spray if available
- STOP, stay calm, assess the situation
- Determine your distance from the bear
- DO NOT run or turn around
- Use soft, low voice
- Avoid rapid movements
- Appear non-threatening
- Keep eyes on bear without direct eye contact
- Assess surroundings
- Leave escape route for the bear
- Determine what the bear is doing (Food nearby? Young nearby?)
- If the bear bluff charges: **STAND YOUR GROUND**

If a bear shows stress signs, including yawning, salivating, huffing, hair up on neck, bluff charging, stomping the ground and swatting trees, be ready for a defensive attack. It means that your presence is stressful for the bear, and it is protecting something, either young, a food source, or its territory.

If you are the target of a **defensive attack**:

- Ready bear spray if available
- You need to recognize stress signs
- Do not shout or escalate the situation
- Do not move until bear leaves
- If the attack escalates, fight back

If you come across a bear and notice predatory behaviour, it may be targeting you for a predatory attack. Predatory behaviour is characterized by stalking you, watching you intently and approaching with no sign of fear or stress.

If you are the target of a **predatory attack**:

- Prepare and use bear spray
- DO NOT be submissive
- Face the bear and yell
- Act aggressively
- DO NOT run
- Remove pack and use as distraction
- Make yourself large
- Raise arms and stomp feet
- Use rapid arm/leg movements
- Fight back - DO NOT play dead
- Attack eyes, nose & face

See the Spectrum of Bear Engagement for more information.

6.0 Wildlife Risk Matrix

The Wildlife Risk Matrix is a tool to help judge the risk of a wildlife encounter. It treats risk as a combination of both likelihood and severity variables.

This Matrix can be used for bears as well as other wildlife.

The following 'likelihood' variables are assessed in the matrix (columns A - D):

- How close is the bear to site (near or on site)? How close are you to bears in the field?
- How often is a bear sighted (occasional or frequent)?
- What time of day are bears seen (dusk or dawn = more likely to be sighted)?
- Are bears in breeding season or seen with young?
- What kind of foods are attracting the bears (natural vs. human food/garbage)?

The matrix also considers whether workers are working in groups or alone. Risk of a dangerous encounter increases when working alone.

Risk can be determined once the bear's level of aggression/habituation is determined (rows 1 - 4) - the 'severity' variables. The following variables are assessed:

- What body language is the animal exhibiting?
- What sounds/vocalizations is the animal making?
- What actions, movements, and reactions is the animal showing?
- How does the bear react to humans? Is it used to human presence? How much personal space does it seem to require? Is it timid?

How far is the animal? Is it approaching? Is it going about its business normally? Is it on its way out of the area?

				Working in a close group-4+	Working in a close group-4+	Working alone	Working alone
				Natural food	Natural food	Human foods/garbage	Human foods/garbage
				No young	No young	No young	Breeding/with young
				Daytime	Dusk or dawn	Dusk or dawn	Dusk or dawn
				Near site OR 300m + away	On site OR 150 m away	On site OR <100 m away	On site OR <50 m away
				Occasional sighting	Occasional sighting	Frequent sighting	Frequent sighting
				A	B	C	D
LIKELIHOOD: As Per Wildlife Aggression Level	Relaxed body language	Wary	1	LOW RISK Level 1 Response	LOW RISK Level 1 Response	MED RISK Level 2 Response	SIGNIFICANT RISK Level 3 Response
	No sounds/vocalizations						
	On its way out of the area						
	Relaxed body language	Habituated	2	LOW RISK Level 1 Response	MED RISK Level 2 Response	SIGNIFICANT RISK Level 3 Response	HIGH RISK Level 4 Response
	No sounds/vocalizations						
	Ignores, makes no move to leave						
	Anxious body language (stress signs)	Defensive and Stressed	3	MED RISK Level 2 Response	SIGNIFICANT RISK Level 3 Response	SIGNIFICANT RISK Level 3 Response	HIGH RISK Level 4 Response
	Some stress sounds						
	Stands its ground/bluff charge						
	Anxious body language (stress signs)	Defensive or Predatory	4	HIGH RISK Level 4 Response	HIGH RISK Level 4 Response	HIGH RISK Level 4 Response	HIGH RISK Level 4 Response
	Aggressive sounds/vocalizations						
	Defensive attack OR stalks prey						



Level 1:	<p>Maintain during all field activities (goal: prevention and avoidance of bear encounters)</p> <ul style="list-style-type: none"> • Control food and food wastes • Control garbage: waste management plan • Communicate bear in area to workers • Report observation of any bears • Follow appropriate safe work practices • Wildlife/bear management plan • Train workers in wildlife/bear awareness • Supply workers with pepper spray
Level 2:	<p>Activate upon sighting of carnivore (bear, wolf, cougar, coyote) or large ungulate (deer, elk, caribou, moose, bison)</p> <ul style="list-style-type: none"> • Continue with Level 1 • Report to authorities, as required for jurisdiction • Assess situation (supervisor) • Assign monitor if necessary (especially for bears) • Mandate working loudly and in close groups of 4+ • Restrict access to where bear was sighted • Pepper spray at hand and ready to use
Level 3:	<p>Activate upon sighting of bear</p> <ul style="list-style-type: none"> • Continue with Level 2 • Temporary stop work to inform all personnel • Retreat to safe observation area (vehicle, building, etc.) • Continue observation of bear until it has left the area • Resume work if/when deemed safe • Bear monitors accompany crews in hazardous areas • Deterrence by authorized individuals ONLY
Level 4:	<p>Implement if bear is considered a potential or real threat to personnel</p> <ul style="list-style-type: none"> • Continue with Level 3 • Stop all work • Evacuate site • Notify authorities of sighting or encounter • If encounter results in injury, obtain first aid/medical treatment • Deterrence by authorized individuals ONLY

6.1 Spectrum of Bear Engagement

The following spectrum describes situations and recommended responses for encountering bears. Bear encounters require specific responses depending on the situation.

Read the spectrum from left to right, and over two pages. Situations are categorized into Prevention & Avoidance (green), Interaction/Encounter (yellow and orange) and Attack (red). Focusing on Prevention & Avoidance in planning for working around bears and other wildlife will help minimize the likelihood that situations will escalate to Encounters or Attacks.

If an encounter or attack does occur, the Spectrum gives advice on how to respond, including actions as well as when to deploy deterrent. Knowing which species of bear you are dealing with is also crucial, because of differences in bear behaviour based on type of bear present.

Note: It is important to be able to read bear behaviour in order to choose the right response to a situation. Know the stress signs and respond appropriately to avoid escalating the situation. Similar to the Risk Matrix, the Spectrum depends on a few key variables. Variables include:

- Is the bear aware of your presence?
- Are young present?
- Is a food source (carcass, berries, etc.) present? A water source?
- Are stress signs present? Does the bear see you as a threat? Is the bear curious?

Note: Bears, like other wildlife, are extremely defensive of young and of food sources.

6.2 Terminology

Bear sighting: When you see a bear but the bear is unaware of your presence.

Interaction: When the bear is aware of your presence (same thing as encounter).

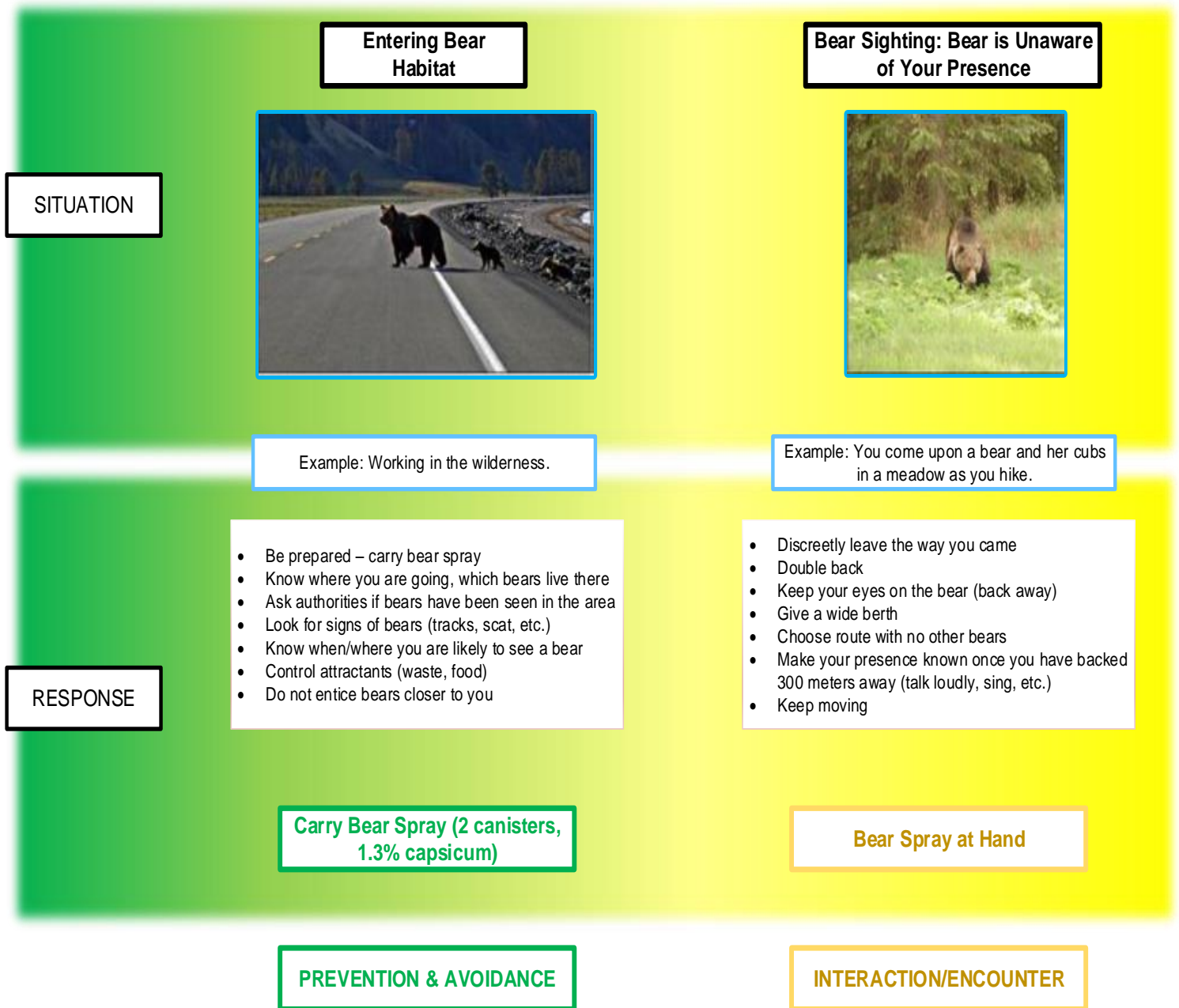
Incident: Interaction between a bear and a person in which the bear acts aggressively.

Attack: Intentional contact by a bear resulting in human injury.

Definitions taken from “Alaskan brown bears, humans, and habituation” (Smith et al. 2005).

Appendix A: Spectrum of Bear Engagement - Field

Spectrum of Bear Engagement – Field



Spectrum of Bear Engagement – Field

Interaction: Bear is Aware of Your Presence



Bears rely on smell; they might stand up and sniff the air to see who you are

Example: The bear in the meadow turns around and notices you.

- STOP, stay calm, assess the situation
- Determine your distance from the bear
- DO NOT run or turn around
- Use soft, low voice
- Avoid rapid movements
- Appear non-threatening
- Keep eyes on bear without direct eye contact
- Assess surroundings
- Leave escape route for the bear
- Have deterrent ready
- Determine what the bear is doing (food nearby? Young nearby?)

Bear Spray Ready

Incident: Defensive Attack



Stress signs include: yawning, salivating, huffing, hair up on neck, bluff charge, stomping ground, swatting trees

Example: The bear feels threatened by your presence and initiates a defensive attack to protect her cubs, which are nearby,

- You need to recognize stress signs
- Attack will occur quickly and end when the bear sees threat as gone
- Do not shout or escalate the situation further
- If the attack escalates, fight back

If the bear bluff charges: STAND YOUR GROUND

Deploy Bear Spray

Predatory Attack



Characterized by: Stalking you, watching you intently, approaching, no sign of fear or stress

Example: You are taking water samples when you turn and see a bear stalking you.

- DO NOT be submissive
- Face the bear
- Act aggressively
- DO NOT run
- Scan for cover i.e. tree and move there
- Remove pack and use as distraction
- Prepare and use deterrent
- Make yourself large
- Raise arms and stomp feet
- Stand on something
- Use rapid arm/leg movements
- **Fight back – DO NOT play dead**
- Attack eyes, nose & face

Deploy Bear Spray

INTERACTION/ENCOUNTER

ATTACK

Appendix B: Resources

The following links will be helpful for those contacting provincial Fish and Wildlife authorities before beginning work. Fish and Wildlife authorities can provide direction on whether wildlife or bears are present in an area and can also make recommendations on a company's plan. In addition, bear and cougar sightings must be reported to Fish and Wildlife authorities. The other links below include more information on bear safety from each government body.

Alberta

Alberta Environment and Parks - Fish & Wildlife
Alberta BearSmart

British Columbia

Ministry of Forests, Lands and Natural Resource Operations - Fish & Wildlife Branch
Safety Guide to Bears in the Wild
Bear Safety
Bears and Cougars

Saskatchewan

Ministry of Environment
Staying Safe in Bear Country

Parks Canada

Bears in the Mountain National Parks

CALGARY

T 403 516 8000 5055 11 Street NE
F 403 516 8166 Calgary, AB T2E 8N4

NISKU

T 780 955 7770 1803 11 Street
F 780 955 2454 Nisku, AB T9E 1A8

FORT MCMURRAY

T 780 791 4944 Box 13 - 8115 Franklin Avenue
F 780 715 3945 Fort McMurray, AB T9H 2H7

BRITISH COLUMBIA

T 250 785 6009 2060 - 9600 93 Avenue
F 250 785 6013 Fort St. John, BC V1J 5Z2

SASKATCHEWAN

T 306 842 9822 208 - 117 3 Street
F 306 337 9610 Weyburn, SK S4H 0W3

Info@EnergySafetyCanada.com
Enrolment Services and Certificate of Recognition:
1 800 667 5567

EnergySafetyCanada.com

