



# CATTLE WINTERING SITES

Managing  
*for*  
Good Stewardship

Agdex #420/580-2



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# CATTLE WINTERING SITES

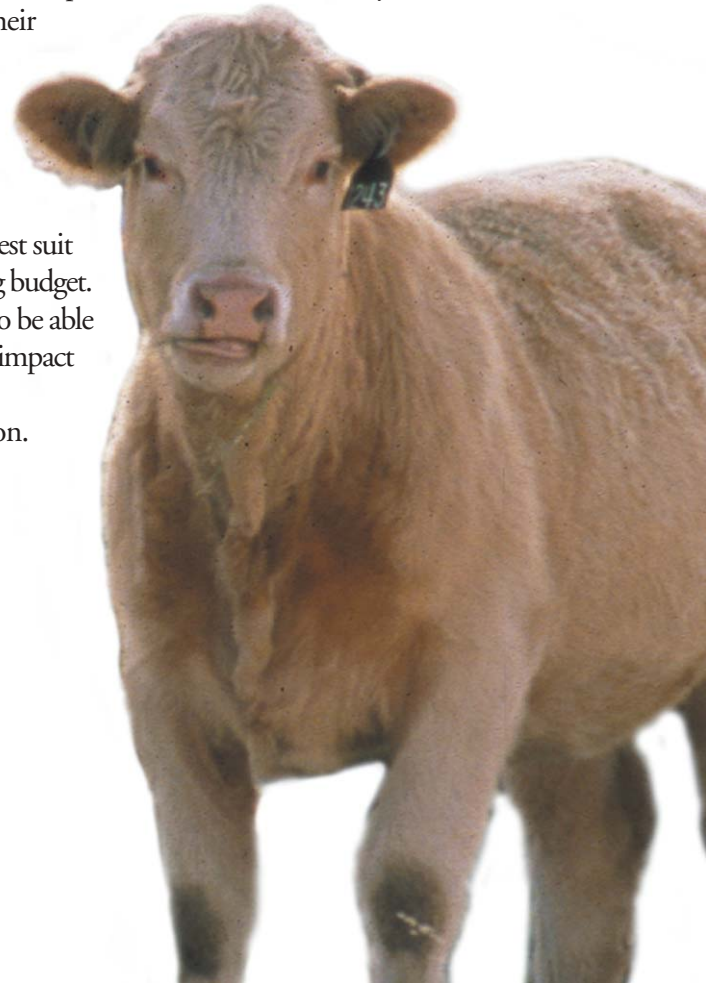
## INTRODUCTION

**Agricultural production has increased thanks to Canada's bountiful natural resources: water, soils, forestry, and minerals. Yet competition exists for these resources from other resource-based industries such as oil, gas, mining, forestry, tourism, recreation and urbanization.**

As a producer, you have a vested interest in protecting these natural resources. And the challenge exists to find a balance between sustaining the environment, and the social well-being of all Canadians. When and where you place cattle on the land is important when considering the environmental health of the landscape. Management of wintering sites is a critical part of your operation because it is a part of the production cycle that can potentially cause environmental damage.

This guide is intended to give you information about potential problems with wintering sites. Common sense and practical solutions that are both effective and economical to cattle operations are offered throughout this publication. By understanding how your operation fits into the bigger environmental picture, you can identify problems and apply common sense solutions. Such solutions will help improve landscape health and increase productivity of your operation.

When reading this publication, it is important to remember that no two wintering sites are the same. Four producers describe how they manage wintering sites on their land throughout this manual. Even though their situations are different, a common theme appears from each: select those management practices that best suit your land, cattle and operating budget. The ultimate goal is for you to be able to assess your wintering site's impact and find ways to prevent environmental contamination.



# DEFINING A WINTERING SITE

A wintering site is the area where cattle are fed during the winter months. Alberta's winter climate often dictates the wintering site. Sites include:

- a feeding area;
- a sheltered area; and,
- a water source.

Manure builds up in the feeding area, resting area and around the water source. As a result, it's necessary to take measures to avoid manure contamination of adjacent water bodies.

Wintering sites are important because of Alberta's limited grazing season. Herds often utilize existing naturally sheltered areas near the farmstead and may include low areas, watercourses or south-facing slopes protected by natural trees. Your operation may also include a specific calving site. Where naturally sheltered areas are insufficient, constructed windbreaks can be used to provide needed protection.

# THE ISSUE OF ENVIRONMENTAL STEWARDSHIP

Environmental issues are becoming more important in livestock operations. Sustainable and profitable production from the land base you manage comes with an understanding of how farming and ranching practices affect the environment around us. Riparian areas are an excellent example of the need for good environmental practice. The fresh water resource they provide to all society is a small and critical one that requires excellent stewardship. The opportunity to pass the land to future generations in a productive and environmentally healthy manner is one that many producers strive to do.

## BUT HOW DO YOU DEFINE STEWARDSHIP?

Stewardship can be defined as an individual's responsibility to manage their resources with proper regard to the rights of others. Maintaining natural resources while carrying out a successful agricultural operation requires management that ensures future generations have a healthy and diverse landscape.

Remember that each livestock operation functions under different circumstances, such as herd size, land base, accessibility to water, shelter and feed. But the stewardship of environmental resources is a common theme for all producers.

## GUIDELINES FOR BETTER STEWARDSHIP OFTEN INCLUDE:

- using grazing systems that enhance sustainability of the pasture or range land resource;
- managing the water supply for your operation;
- ensuring safe water for all other water users;
- protecting the riparian zone for an improved variety of species: aquatic, wildlife and plant populations; and,
- protecting the landscape from erosion and nutrient overload.

Adjustments in management, facilities, and/or siting can have present day costs of money or time, but may provide larger benefits in the long term.

## EXAMPLES OF THOSE BENEFITS INCLUDE:

- improved animal performance as a result of access to clean water;
- improved distribution of manure by using stockpiled forage, swath grazing or movable feeders;
- increased productivity as a result of proper feed locations, resting and watering sites;
- improved labor and cost efficiencies;
- improved neighbor relations through a clean, well-managed operation; and,
- improved opportunities for bank loans.



## PRODUCER PROFILE: FRANCIS GARDNER

# BELIEVING IN ENVIRONMENTAL STEWARDSHIP

“The grass grows lush and green along the northern tip of the Porcupine Hills at Mt. Sentinel Ranch. And its owner, Francis Gardner, is doing everything he can to keep it that way.

“I think it's real interesting that you begin to think of long-term destinations and where you might be in the next 100 years, it's quite different than from a year-to-year situation,” Gardner says, talking about his philosophy of environmental stewardship.

“If we begin to think this way, then we all need to be persuaded that stewardship rules the world.”

Mt. Sentinel Ranch is located at Chain Lakes, Alberta, south of Longview, and is home to 500 head of cattle. For nearly 30 years, Francis has taken the theory of environmental stewardship and turned it into practice.

“We're so surrounded by man-made inputs that it becomes necessary to back away from some of that,” says Francis. “Your peer group may think you're a little off base, but I think there's a natural fit with the environment of production (rain, water and soil) and the ecosystems that support us all.

“Those amounts may vary from location to location, but they are common elements to all farmers. And once you begin to get into the mindset that it's all about being a part of a bigger picture, that you're just a cog in the wheel of the real world, then you begin to watch what you're doing to the land,” he says.

Francis realizes that his situation is unique because of the native grasses that grow on his property. Since his operation hasn't used fertilizer or

chemicals since 1982, Francis says they've had to become more intelligent in terms of keeping litter to better utilize crop debris and incorporating more carbon and nitrogen back into the soil naturally, through such ways as seeding sweet clover. “When you're learning about it you think that it's so obvious. But you still need to learn.”

As for environmental stewardship advice to other producers, Francis says that everyone needs to be wise in the ways they use the land, what he calls the rules of the world.

“We're merely trying to keep something that's always been here.”

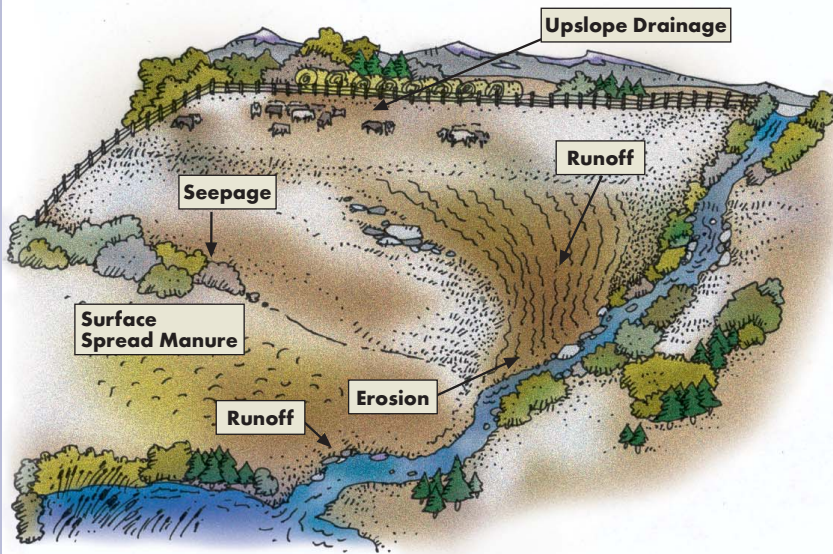
# EVALUATING APPROPRIATE WINTERING SITES

**Selecting a wintering site that is sloped away from a water course or water body is a major step towards protecting the environment.**

An objective for all livestock operations is to economically provide a comfortable and healthy environment for the cattle without compromising surface and groundwater quality. A south slope is often selected for a wintering site in order to gain winter sun exposure. When this type of site is used in combination with a natural or constructed shelter it provides a protected environment for wintering livestock.

The primary consideration when selecting a wintering site is the water source. Livestock require a secure high quality water source during the winter feeding period. The water source should be an acceptable distance from the feeding area to accommodate ease of availability and to lessen the risk of contamination.

## POTENTIAL POLLUTION PATHWAYS FROM CATTLE FEEDING SITES



Pollution has the potential to occur through surface runoff, groundwater seepage, soil erosion, sedimentation and unmanaged access of livestock to water. This section discusses and identifies some practical solutions for lessening the risk of contamination within these areas.

Contamination of any water source creates a health concern, decreases its quality and reduces its general usefulness. Increased sediment, color, offensive taste and odors are problems often reported by water treatment facilities. Significant health issues can arise from entry of various microorganisms in surface and groundwater. Water supplies contaminated with manure contain fecal coliform bacteria, such as *Escherichia coli* (*E-coli*) and may have other disease-causing microorganisms such as *Cryptosporidium* and *Giardia*. Water contamination by either parasites or bacteria occurs when infected fecal material is either directly deposited into water or when heavy rains or spring snowmelt increase runoff of waste material from the land. If animals or humans drink the contaminated water, serious health issues may occur. For instance, *Cryptosporidium* can cause severe gastrointestinal illness, while *Giardia* may result in weight loss and diarrhea.

While these illnesses are self-limiting in animals or people with healthy immune systems, they can be life threatening to the elderly, young, or those with weakened immune systems. Consequences to livestock operations have been reported as animal weight loss, significant calf losses in beef herds from *Cryptosporidium* infection, or chronic infections of some animals, particularly calves, by *Giardia*.

*Cryptosporidium* and *Giardia* are both single-celled, microscopic parasites that live in the intestines of humans and animals. The dormant form is excreted in the stool of infected animals and humans. In its dormant form both parasites have a hard outer shell that protects it from severe environmental conditions, and allows it to survive outside the body for long time periods (up to 12 weeks). If it is ingested, stomach acids break down the protective outer shell so that the infective insides are expelled allowing the organisms to begin reproducing in the intestines.

*Escherichia coli* (*E.coli*) are bacteria found in the intestines of humans and warm-blooded animals and are necessary for a number of important functions, including digestion. However, different strains, such as *E. coli* O157:H7 produce powerful toxins that may cause severe illness in humans such as bloody diarrhea, fever, vomiting, and kidney failure.

# DETERMINING RUNOFF RISK



**Managing runoff includes factors such as slope, precipitation, soil type, drainage patterns, vegetative cover and flooding hazard.**

It also involves management factors such as your methods of feeding, bedding and watering. Assessing the site and knowing its history allows for an estimate of runoff risk. Assess your runoff risk by using the following rating factors.

**TO EVALUATE THE RUNOFF RISK ON YOUR FARM, IT MAY BE HELPFUL TO PLACE YOUR SITE IN ONE OF THESE THREE CATEGORIES:**

- Flat ground (less than 2 percent slope) has the least chance of runoff.

- Slight (2 to 6 percent) to moderate slopes (6 to 12 percent) have a greater chance of runoff.
- Steep slopes (over 12 percent) have the greatest chance of runoff.

## RUNOFF RATING FACTORS

There are a number of factors that can assist in determining the runoff potential of a site.

- precipitation/climate (high or low);
- soil drainage/type (sand or clay);
- surface water entering the feeding area (high or low);
- vegetative cover (good or poor);
- flood hazard (high or low), and
- tall trees on the perimeter of a site may shade and modify snowmelt and runoff.

Looking at these factors in combination can assist in determining the overall runoff risk from your wintering site. Consider these rating factors in determining which of the following overall risk categories you fall into.

## CONTAMINATION RISKS

### LOW

These are areas with little to no runoff or have controlled runoff. They often have adequate vegetative cover. With continued good management, these areas should require no or minimum alterations.

### MEDIUM

These are areas with little (moderate) runoff and show some risk to either surface water and/or groundwater. You may consider making improvements in one or more of the rating factors listed above. These improvements may not require extensive alterations.

### HIGH

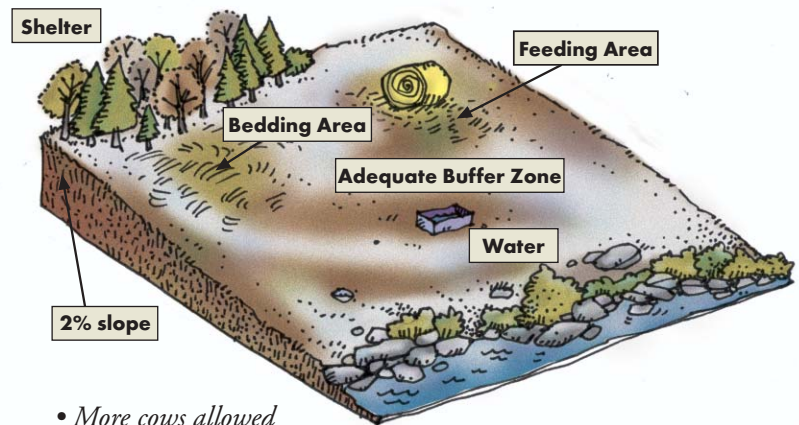
These are areas with greater runoff and show significant risk to either surface water and/or groundwater. You need to improve one or more of the rating factors. Since factors such as slope, precipitation and flood hazard are uncontrollable, high risk locations require significant changes or should be abandoned.



## SLIGHT SLOPE AND MODERATE TO STEEP SLOPE

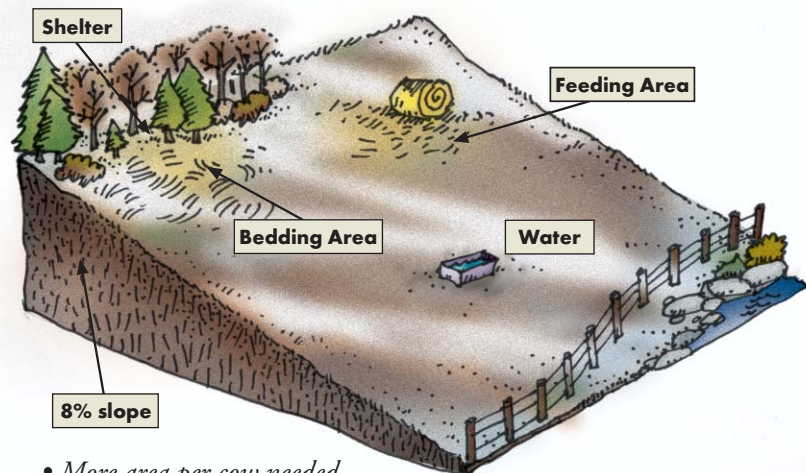
- Select a naturally elevated area for bedding to ensure drainage is controlled in a direction of least risk of water contamination.
- Provide an off-site water supply or dugout.
- Increase the size of the wintering site area. This decreases the livestock stocking density and concentration of manure on the site. Diagram 1 and 2 illustrate the need for increased area.
- Increase the distance between major manure sources such as bedding and feeding areas and the watercourse to reduce manure accumulation. Locate one or both of these areas near or at the top of the slope where it will be the most beneficial for crop growth.
- Create a vegetative buffer between the feeding site and the watercourse. The greater the width and height of vegetative cover, the more effective the buffer. This buffer can be harvested as winter feed to prevent an overload of nutrients in that area. *(Note: this can become a sink and later saturated and a source of contaminants as the system is overloaded and nutrient overflows occur.)*
- Move the feeding site frequently during the feeding period. This disperses the manure and reduces the amount of contamination leaving the site. *(See page 13 for various available feeding strategies.)*
- Consider alternating several sites from winter-to-winter to minimize nutrient buildup.
- Use a natural wetland or treed buffer strip to make use of runoff nutrients which can later be harvested as a feed crop.
- Divert upslope surface water around the feeding site.

DIAGRAM 1:  
RUNOFF FROM A SHALLOW SLOPE



- More cows allowed
- Need elevated area to have well-drained bedding area
- Off stream watering desirable
- Adequate buffer zone between feeding and bedding area and water.

DIAGRAM 2:  
RUNOFF FROM A STEEP SLOPE



- More area per cow needed
- Stay back further from water
- Off stream watering is critical
- Install a catch basin to contain runoff.
- Select a site that is not subject to erosion.
- Construct berms or landscape the site to divert runoff water from surface waters.
- Use fencing to control the time of use or keep cattle out of sensitive areas.

# SEEPAGE OF MANURE NUTRIENTS INTO GROUNDWATER



**Potential contamination of groundwater can occur as nutrients infiltrate through the soil to the water table. Groundwater recharge areas are especially susceptible to contamination risk.**

It's difficult to assess or predict this process since you can't see it happen. How large this problem becomes is largely dependent on the permeability of the soil, the amount of manure accumulation and distance to the water table. Determining the texture of the soil in your wintering site will help assess the risk of this nutrient-rich water leeching into the groundwater. Gravel and sandy sites should be avoided.

## **FINDING POTENTIAL SOURCES OF SEEPAGE**

You can expect seepage to occur where runoff collects behind berms and other restrictions on porous soil. Manure stockpiles are also potential sites for seepage. Seepage also occurs in buffer strips where vegetation cannot capture and tie up nutrients in the thatch of plants. It can also happen in slough recharge areas.

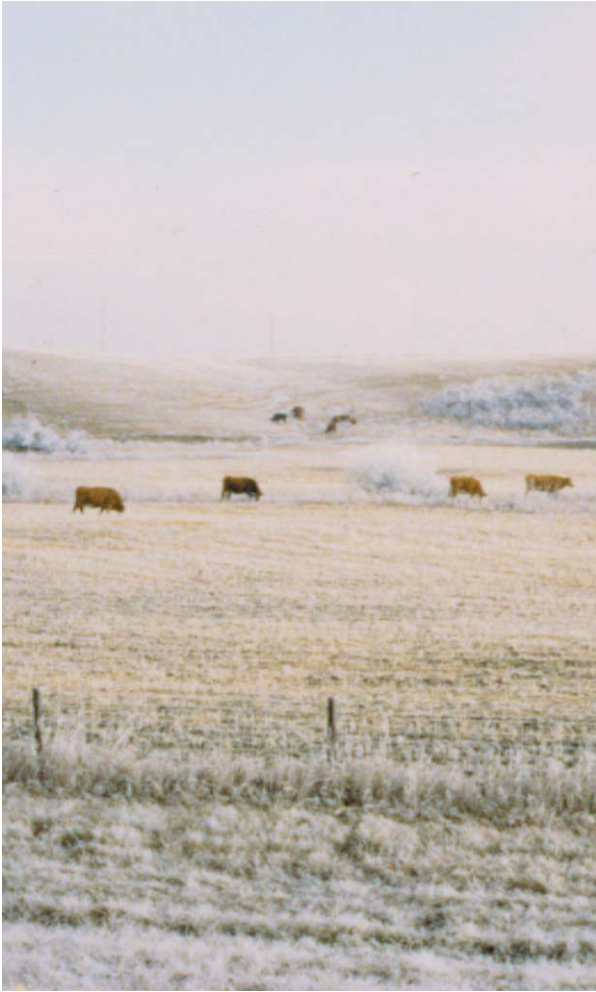
The risk of seepage is greater if you operate a seasonal wintering site, as opposed to using a year-round feedlot.

Because the soil is frozen for most of the time the wintering site is in use, little seepage occurs. But late spring, summer and fall are the times of risk for manure nutrients leaching into the groundwater. Minimize any potential leaching by removing accumulated manure so vegetation can grow throughout the growing season. Harvest vegetation buffers as a productive feed supply to remove nutrients in the form of high quality nutritious feeds.

A water well or an abandoned well can also be a direct pathway from the land to an aquifer. It makes sense that any activity around a well can directly contaminate the groundwater. Ensure the wintering site is kept a safe distance from the well. Spills directly beside improperly sealed well casings, improperly abandoned wells, or flooded well pits can result in the direct contamination of a well and aquifer.

## **PRACTICAL SUGGESTIONS FOR MANAGING SEEPAGE**

- Avoid high water table areas.
- Avoid sites on very porous soils such as sands, gravel, shale or sandstone outcroppings.
- Choose sites with clay soils which have the least infiltration.
- Increase the size of the feeding area on porous soils to reduce manure concentration.
- Move the feeding site regularly during the winter to minimize manure buildup.
- Remove manure where it has built up over the winter season as this prevents movement of nutrients into the soil when it thaws or when it's subjected to precipitation.
- Harrow the area in the spring to disperse any remaining manure and straw.
- Ensure adequate vegetation is growing on the site to bind the nutrients.
- Choose appropriate crops that have high nutrient requirements during the growing season.
- Abandon wells properly.



## EROSION

**Rapid snowmelt or heavy rain storms on bare ground will result in soil erosion. The lack of surface residue allows the water to flow swiftly, thereby picking up soil particles with no means of re-depositing them again.**

This affects water quality by increasing the sedimentation of surface waters. All soils can be at risk to water erosion, depending on the degree of slope. Sediment rich surface runoff tends to be nutrient rich. Dissolved nutrients such as nitrogen and phosphorus are attached to the suspended soil particles transported in the runoff.

Care should be taken to not spread manure on lands that are subject to erosion from surface water or where the water flow is concentrated in a channel.

Upland sites adjacent to riparian areas and stream banks are at greater risk of water erosion if grazed so frequently that inadequate plant cover is left and bare ground becomes prevalent. Timing of grazing and recovery, duration of stay and severity of grazing can allow for strong stands of forage to be safely used in erosion prone soils. Short term duration grazing can remove excess nutrients and be a solution to phosphorus and nitrogen loaded sites. This allows the manager to protect the integrity of the site and achieve a healthy level of production from that land.

## FLOODING HAZARD

It is best not to locate a wintering site in an area where a flood is expected more than once every 25 years. Long-time residents are often a good source of information on flood frequency and high water levels.

## LEGISLATION

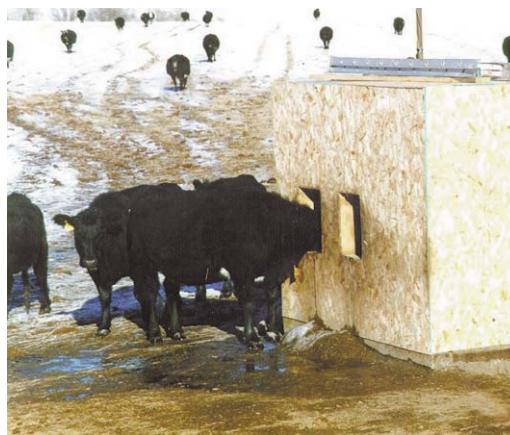
Seasonal feeding and bedding site locations are regulated under the Agricultural Operation Practices Act (AOPA). Please refer to AOPA and the other references listed in the back of this book for more information.

# MANAGING THE WINTERING SITE

**While some physical characteristics of the site such as slope, soil type, water table and climate may be beyond your control, others can be managed successfully. These include water supply, managing cattle access, cattle density, feeding and bedding strategies, and runoff control methods such as vegetation residue or buffers left downslope and in riparian areas.**

Sometimes common sense is more effective than the application of technology when it comes to finding solutions for inappropriate wintering sites. This section of the publication gives you some suggestions that are within your control.

## WATER SUPPLY



**A very important part of a wintering site is the availability of safe, quality water or snow. Many options are available to you for providing off-site winterized watering systems.**

Such systems decrease potential for leg injuries, fatalities, competition and water quality risks that are found with uncontrolled access to surface water. There are also many power supply options to choose from that can include grid, solar or wind power.

Although there are many options available to you if you have a surface water supply, you may want consider using a wet well. A wet well can be constructed with either a large or small diameter pipe, that is plastic or steel. In most cases a building is placed directly above the wet well, but there are many ways to keep the water from freezing. When using an insulated heated building, three-quarters of the trough is inside the building, with the rest extending outside for animal access. If using a non-insulated unheated building, cattle push open a trap door that activates the water pump.

**For more information on specific practices involving water supplies and the relevant legislation refer to the following publication: Beneficial Management Practices: Environmental Manual for Alberta Cow/Calf Producers Agdex 420/28-2.**

The water is then pumped into a small trough located inside the building. When the cattle back away from the trap door, the door closes the switch, the pump shuts off and the remaining water drains back into the wet well.

Automatic or energy efficient watering bowls are options when using a groundwater supply. The energy efficient watering bowl uses ambient ground temperature and a double 24-inch cylindrical vertical Styrofoam culvert to keep the water from freezing.

The first section of the pipe is where the water is stored from the pressure system and has the top closed off with an insulated lid. The water then gravity feeds to the second section which is open on top to make a watering bowl. This system requires grid power as it is part of a pressure system.

Since most off-site water sources are permanent, some manure accumulation is unavoidable. Be sure to assess and control any runoff potential to surface water.

With the trend to more extended grazing systems such as stockpiled forages, annuals and swath grazing, look at installing winterized pasture watering systems or learn more about using snow as a water source.

#### **PRACTICAL SUGGESTIONS TO MANAGE A WINTERING SITE WATER SUPPLY:**

- Construct an alternative watering system from a secure supply.
- Install a waterer for reliable year-round use in a location away from the watercourse to minimize potential contamination and to help distribute manure more evenly.
- Place the waterer on a concrete base for cattle comfort and sanitation.
- Stockpile manure by periodic scraping during the winter.

*Page 21 in this publication lists other resources, if you'd like more information on developing off-site water systems for wintering sites.*

## **MANAGING CATTLE ACCESS**



**Water degradation occurs when cattle can enter natural water bodies. Consider controlled access or off-site watering to prevent degradation.**

Several methods exist for you to supply water off-site. Watering livestock throughout the coldest months of the year usually involves some form of remote watering system using groundwater supply, such as an automatic watering bowl, or a sheltered/housed cattle powered pump.

Even though naturally occurring shelters are less expensive to use, they are seldom in the best feed and water locations. Windbreak fences and/or open front sheds (portable or stationary) are helpful, since you can effectively place them in relation to water, feed sources and other farm buildings.



## PRODUCER PROFILE:

GREG CONN

# TAKING THE WATER TO THE CATTLE

Along the banks of the Red Deer River, cattle producer Greg Conn undertook a challenge to himself. He wanted to keep an abundant supply of clean water not only for their farm use, but for downstream users too.

"Now, more than ever, we are, and should be held accountable for our management practices as they affect many neighbors, near and far," says Greg.

Greg accomplished this by moving his winter feeding area one mile from the river, where he used to have his wintering site.

"We now move the feeding area each day, and this helps spread the manure out on the fields, where it

should be, rather than concentrated on the river bottom. I also feel that walking to water everyday is good exercise for the cows," he emphasizes.

Greg had three unsuccessful attempts to drill wells at the new location site. The original well is only 20 feet deep, and is basically the river running through gravel. "Our options to expand were limited," he says. "We could take the cattle to the water, or take the water to the cattle. We chose the latter."

With the help of PFRA, the operation ditched in a pipeline from a well at the river bottom up to the main farmstead. The pipe was 1<sup>1</sup>/<sub>4</sub> inches round and 1,000 feet long to the main

junction and 200 feet more to the farthest waterer. Greg explains that should he need to, he ensured that he had the capacity to expand the pipe further.

The only pump requirement is a simple <sup>3</sup>/<sub>4</sub> horsepower jet pump.

Overall, Greg says he's pleased with the positive results he's seen. He's reached the goal of keeping the river clean, as well as keeping the cows away from the river in the winter-time. "We found that by installing high output waterers, the cows don't have to wait in line very long, and they prefer to drink out of them!"

# MANAGING CATTLE DENSITY



**By studying your current feeding area, you'll notice that cattle use predictable routes between the bedding, water and feeding areas. Where cattle spend the most time results in the most manure buildup.**

Minimize manure buildup by encouraging your herd to deposit manure over a larger area. This is achieved by periodically moving the feeding and bedding location throughout the entire wintering period. If you keep the feed, bedding and water supply well separated, less manure buildup results at any of these locations.

Other feeding methods such as extending the grazing season with annuals or stock piled forages, swath, chaff, and bale grazing forces the cattle to spend more time over a larger area.

## FEEDING STRATEGIES

You also need to consider the length of the feeding period when managing the feeding and bedding at a wintering site. A longer feeding period results in more manure accumulation. These periods vary from operation to operation. A major factor affecting the winter feeding period is the management of the pastures during the summer months.

### MANAGING THE FEEDING AREA

Manure buildup occurs when using permanent feed areas. Consider moving your feeding area regularly to prevent build-up. Bales can be rolled out on new areas throughout the winter if the space is available. Similarly, relocate movable feed bunks or feeders and portable wind breaks to distribute manure over a greater area. In the spring consider harrowing or tilling the feeding area to improve forage re-growth and the overall forage palatability of the wintering areas.





## PRODUCER PROFILE:

WYETT SWANSON

### PORTABLE SYSTEMS MEANS MORE PROFITABLE WINTERING SITES

“You could say that almost everything is portable at Wyatt Swanson's farm. From feed bunks and calving shelters to bale feeders, portable systems are helping Wyatt reduce his management costs. At the same time it's keeping his cows healthier and happier.

The Swanson ranch is located north of Provost in east-central Alberta. Since the operation was mostly a grain farm in the 1970s, a 2,000 capacity feedlot was built to help them utilize their grain. But they found over time that their margins were getting smaller. Wyatt decided they'd try utilizing their grain through a large cow herd, and find a way to cheaply produce calves.

Moving to this strategy meant changing his wintering site areas.

Today Wyatt places 1,000 cows on 500 acres, but separates them into four side-by-side paddocks. Since his operation calves in May, the cows are placed on the wintering site from Christmas to around the third week in April.

"Our system is not made for winter calving, but it's excellent for over wintering," explains Wyatt.

"By using the portable bunks we're able to move the cows around, which helps spread the manure easily." This saves on fertilizer costs and field time, as he only has to work the land once.

"I believe we were one of the first in the area to use portable wind breaks. We used to let our cows use the trees (as windbreaks), but that killed the trees," he says. The windbreaks form an L shape, and are placed on skids, easily movable by tractor. Wyatt used the concept of a feedlot fence, where the boards have 20 per cent spacing, are eight feet tall, with 40-foot long sections.

The feed bunks are 36 feet long, 4 feet wide and 1<sup>1/2</sup> foot deep, and will feed around 100 cows, he says.

When moving his cows around the field Wyatt says he tries to get one dropping per square yard. By doing this he knows he's getting nutrient value on the land.

"You've got to remember one thing—that the average cow puts out \$150 worth of nutrient value back to the soil. In the wintertime the cows put out \$75, with half of that being urine. You've

got to move the cows to get the value of the nutrients. It's a way more effective system."

And he's seen the results to prove his systems are working. "We were hailed out twice this year, and our silage crop has grown back twice. The last storm basically made the field look like summerfallow," he explains. But because the fertility is so high in his soil, Wyatt says he has a better than average crop. Soils with high organic matter from manure additions are also an excellent buffer against the effects of drought. These fields produce when other fields cannot.

"You've always got to look for a win-win situation. I think that's the success of agriculture today. You've got to make the cows work for you, and not you working for them. And using portable systems are a very cheap way of doing business."



# BEDDING STRATEGIES



**The greatest accumulation of straw and manure usually occurs in the bedding area. When planning your wintering site, consider several bedding areas. Buildup occurs around stock waterers and the bedded area; this is especially true where large amounts of straw are needed to ensure cattle comfort.**

To better manage the bedding area, develop windbreak shelters away from the water supply. This can be in the form of 20 per cent porosity fences, shelterbelts, open front sheds or other structures. Using portable windbreaks to encourage the cows to move their bedding site is especially useful in combination with swath grazing. Periodic movement of the portable windbreaks allows the manure to be deposited on the land and minimizes accumulations in any one

location. Spring fieldwork can then be done without problems due to excessive manure accumulation.

Cattle will seek shelter from harsh weather in treed or brush covered areas. If sheltered areas are away from the water supply, runoff will be minimal. However, if sheltered areas are located along a watercourse, degradation from cattle use may occur to shelterbelts. Feeding areas that include riparian areas should be managed to encourage cattle to seek shelter and bedding away from the riparian areas.



**When planning a shelter, determine where the snowmelt will occur in the bedding area. Water from melting snow should be diverted away from manured or bedding areas.**

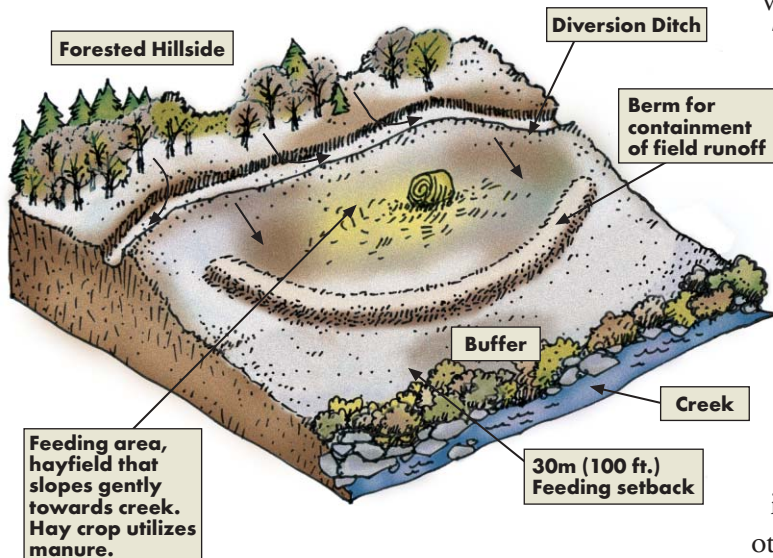
# RUNOFF CONTROL

**If the chosen site is excellent in every other way except for runoff risk and if no reasonable siting options are available, other means of catching the runoff are necessary. This can be done in several ways:**

## DIVERT CLEAN SURFACE WATER

Sources of spring snowmelt behind shelterbelts and windbreaks should be considered in the overall siting of the wintering site to avoid runoff problems. Prevent clean, upslope surface water from entering the wintering site during spring runoff by ditching or berming. This often improves the feeding site by reducing mud problems, calf scours and bedding needs.

## MANAGEMENT FACTORS FOR WINTER FEEDING SITES



## VEGETATIVE COVER OF THE WINTERING SITE

The vegetative cover on the feeding site affects the flow of runoff. However, as runoff often occurs late in the feeding period (i.e. early spring), the winter's hoof action by the livestock will have reduced the stubble effect.

Having a sufficient litter layer or long crop stubble (15 cm in a slightly sloped area is adequate, more stubble height and residue may be required if the slope is greater), in combination with a sufficient buffer between the wintering site and the watercourse, greatly reduces the risk of water pollution.

## VEGETATIVE BUFFERS TO TREAT RUNOFF

Various types of buffers can be used to treat runoff from smaller feeding sites. Vegetative filters such as pastures with sufficient litter and stubble residue present, grassed waterways, trees or even cropland are used for diluting runoff. Treatment occurs through a combination of settling, filtration, dilution, absorption, infiltration and plant uptake of nutrients.

Such buffers are very effective for summer discharges but have some limitation for treating spring runoff while vegetation is dormant and the soil is frozen. The diagram illustrates the different concepts of vegetative filters using channels and overland flow methods.

## DIVERT OR CONTAIN RUNOFF

Many farmsteads have established and expanded near watercourses. Alternative siting options may be very limited where dictated by topography, permanent services and facilities. Distances from wintering sites to water bodies should be greater than 30 meters. If the site is too close to a water body or is causing a severe impact on a water body, producers should look at other options.

Other options can include the construction of a proper berm to divert runoff away from the surface water. Producers may also construct a catch basin in order to protect the water body. This may be a costly alternative but much cheaper than relocating your facilities. Engineering advice should be obtained to determine a suitable berm or containment design.



## PRODUCER PROFILE:

STAN TAYLOR

# A CATCH BASIN HELPS THIS PRODUCER KEEP BLUEBERRY CREEK CLEAN

Stan Taylor knew when he was building a cattle operation back in the early 1980s he would eventually need to find a way to minimize the environmental impact of his facilities.

It would be nearly 10 years later when Stan found what he was looking for - in the form of a catch basin.

"I think everyone has to realize that they have a responsibility to do their part," says Stan, talking about his decision to build the catch basin. "So when they're building facilities or barnyard that they have to look at catching the runoff."

Stan operates Hillbrook Feeders, an 8,000 capacity feedlot. The feedlot itself is located on a southerly slope in the Blueberry Creek valley north of the hamlet of Leslieville. The basin was built in cooperation with the County of Clearwater and the local PFRA office.

When spring water samples in 1995 showed higher phosphorus levels in the creek a catch basin was built. The basin is 150 feet wide by

300 feet long, and was built at a higher elevation to use gravity when draining the basin during summer.

The drain system has a valve in the bottom of the basin with a flexible hose attached to a floating inlet to take the water from the top of the water column. Stan was advised that a portion of the phosphorous in the wastewater would settle out of the aerobic water column. By siphoning from this portion of the basin there would be less phosphorous entering the filter strip.

"We've used the south bank of the catch basin for a road, and created a wetlands (or vegetative filterstrip) south of that. South of there is the filtration system, and a berm that's been built," says Taylor. The filterstrip, which is around three acres in size, runs along the creek, and is separated from the creek by a berm. Between the berm and the creek lies an area of native lowland forage species and willows to help distance the creek from the filterstrip and the basin.

At the end of the filterstrip the wastewater is eventually released, in a cleaned-up form, back into the creek's riparian area.

"I don't visually get to see the results, other than the County and PFRA officials telling me that it's working," explains Stan. But test results show the system works. In 1998 the vegetation from the filter strip accepted the nutrient content of the wastewater without negative impact.

Although more testing will continue to be conducted, Stan knows the system is working, and most of all, he says he is willing to continue doing what he has to do to keep wastewater pollutants away from Blueberry Creek.

"It's like throwing paper out the window. If you do your part, there won't be much garbage out there." says Stan.

"We've all got to help out."

# CONCLUSION



**Alberta's landscape is as productive as it is diverse. Part of that productivity comes from the thousands of farmers and ranchers who call this province home.**

Cattle graze on a vast land base, have access to abundant grasses and grains, and find shelter at home on your fields.

It's up to you to keep your landscape healthy. Environmental issues are becoming paramount in how you manage your operation. By understanding how your operation fits into the bigger environmental picture, it becomes necessary to look for problems and apply common sense solutions.

This publication has given you practical solutions to choosing those management practices that best suit your land, cattle and operating budget. It's important to remember that no two wintering sites are the same. Manure management problems are different for every operation. The ultimate goal for any livestock operation is to improve the health of your landscape, and increase productivity. It all comes down to good stewardship for future generations.



# SITE RISK EVALUATION

Your goal is to score low

Low Risk 37 - 100

Medium Risk 101 - 150

High Risk 151 - 215

SITE CHARACTERISTICS	3 - BEST	9	15 - WORST	POINTS
Drainage into Water Run	no direct drainage to water run	indirect drainage to water run	direct drainage to water run	
Watering Source	off-site waterers - no access to water body	controlled access to water body	uncontrolled access to water body	
Size of Feeding Area	<2 - cows/acre	2 - 6 cows/acre	>6 cows/acre	
Bedding	frequent moving of bedding pile		one bedding pile	
Feeding	daily moving of feed source	periodic	one feeding spot	
Shelters	use portable shelters to spread out cattle		one sheltered area only	
Manure Concentration	cattle fed over a large area		cattle fed in a small area	
Slope of Wintering Area	<2%	2% - 12%	>12%	
Sub Total				

SITE CHARACTERISTICS	2 - BEST	6	10 - WORST	POINTS
Amount of Ground Cover	high cover	medium cover	low cover	
Flooding Hazard	no flooding		area floods	
Surface Water Runoff Entering Feeding and Bedding Area	no upslope runoff water passes through site		upslope runoff water runs through area	
Site Movement	move to new site every year		use same site every year	
Location to Water Well or Abandoned Well	no well in feed or drainage area	well in feed or drainage area but properly protected	well in feed or drainage area with no protection	
Months in Feed Area	<3 months	3 - 5 months	>5 months	
Buffer Zone Between Feed and Waterbody	>30 m and well vegetated	>30 m or well vegetated	<30 m and not well vegetated	
Manure Spreading	distribution by cattle movement	spread after spring thaw	spread on frozen ground or remains in pile	
Sub Total				

SITE CHARACTERISTICS	1 - BEST	3	5 - WORST	POINTS
Yearly Average Snow Cover	< 2 inches	2 - 10 inches	> 10 inches	
Soil Type	clay	sand	gravel	
Water Table	extremely low water table - >4 metre below surface	4 - 1 metre	high water table - <1 metre below surface	
Sub Total				
Grand Total				

# GLOSSARY

## **Escherichia coli (E.coli)**

E. coli are bacteria found in the intestines of humans and warm-blooded animals, and are necessary for a number of important functions, including digestion. However, different strains, such as E. coli O157:H7, are genetically different and present health risks by producing powerful toxins that may cause severe illness such as bloody diarrhea, fever, vomiting, and kidney failure.

## **Cryptosporidium**

Is a single-celled, microscopic parasite that lives in the intestines of humans and animals. The dormant form is excreted in the stool of infected humans and animals.

## **Giardia**

Is a single-celled, microscopic parasite that lives in the intestines of humans and animals. The dormant form is excreted in the stool of infected humans and animals.

## **Infiltration**

The downward movement of water through cracks, joints and pores in soil and rock. Infiltrating water can move into the ground water.

## **Leaching**

The movement of water carrying dissolved or suspended substances through the soil profile.

## **Nutrient**

An element essential for plant or animal growth. Major plant nutrients include nitrogen, phosphorus, carbon, oxygen, sulphur, and potassium.

## **Pollution**

Any entry of manure nutrients, solids and/or microorganisms into surface water, groundwater or soil that diminishes their usefulness.

## **Riparian Area**

Riparian areas are formed as the result of water, soil and vegetation interacting with one another. They begin with fine textured, deep soils developed in stream drainages. Riparian areas stay greener longer and produce more forage than uplands, partly due to soils and mostly due to an elevated water table.

## **Seepage**

Seepage is the slow movement of water through the soil from a large undefined area into or out of a surface or subsurface water body. In contrast, a spring is where water emerges from a defined location.

## **Stewardship**

Stewardship can be defined as an individual's responsibility to manage their resources with proper regard to the rights of others.

## **Wintering Site**

A wintering site is the area where cattle are fed during the winter months.

# FOR MORE INFORMATION

The majority of the publications listed below are available from Alberta Agriculture, Food and Rural Development, Alberta Beef Producers, Prairie Agricultural Machinery Institute (PAMI) or Agriculture Agri-Food Canada - Prairie Farm Rehabilitation Administration (AAFC-PFRA).

*Automatic Livestock Waterers,*  
Alberta Agriculture, Food and Rural Development,  
Agdex #716(C52).

*Caring for the Green Zone: Riparian Areas and  
Grazing Management,*  
Publication number I-581, ISBN: 0-7732-1435-6.

*Fencing with Electricity,*  
Alberta Agriculture, Food and Rural Development,  
Agdex #724-6.

*An Introduction to Swath Grazing in Western Canada,*  
Alberta Agriculture, Food and Rural Development,  
Agdex 420/56-1.

*Pasture Water Systems,*  
Alberta Agriculture, Food and Rural Development,  
Agdex 400/716-3.

*The Stockman's Guide to Range Livestock Watering from  
Surface Water Sources,*  
Prairie Agricultural Machinery Institute,  
ISSN No. 0-9696896-3-2.

*Water Wells that Last for Generations,*  
Available from Alberta Agriculture, Food and Rural  
Development, Alberta Environment, or PFRA.

*Agricultural Operation Practices Act (AOPA),  
2004 Reference Guide, Agdex 096-1.*

*Wintering Sites and Livestock Corrals: What is required  
by the Agricultural Operation Practices Act,  
Agdex 096-4.*

*The Agricultural Operation Practices Act:  
How it Affects Cow/Calf Producers.*

*Beneficial Management Practices: Environmental Manual  
for Alberta Cow/Calf Producers,  
Agdex 420/28-2.*

*Quality Farm Dugouts,  
Agdex 716(B01).*

## CONTACT INFORMATION

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### AGRICULTURE AND AGRI-FOOD CANADA- PRAIRIE FARM REHABILITATION ADMINISTRATION (AAFC-PFRA)

Phone (403) 292-5638  
Phone (780) 495-3307  
[www.agr.gc.ca.pfra](http://www.agr.gc.ca.pfra)

### ALBERTA AGRICULTURE, FOOD AND RURAL DEVELOPMENT

Alberta Ag-Info Centre 1-866-882-7677  
[www.agric.gov.ab.ca](http://www.agric.gov.ab.ca)

# CATTLE WINTERING SITES



Agriculture and  
Agri-Food Canada

Prairie Farm Rehabilitation  
Administration

Agriculture et  
Agroalimentaire Canada

Administration du rétablissement  
agricole des Prairies



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