

## Best Environmental Management Practices for Open Feedlots

Open feedlots have the potential to degrade nearby water resources if they are not managed properly. There are several management practices that can be used to minimize the feedlot impacts on soil, water, and air of the surrounding areas. This publication will discuss “Best Environmental Management Practices” for open feedlots.

### Lot Construction

Good management starts with good construction. The first step in minimizing water quality effects of feedlot runoff is diverting all outside water away from the lot. If upstream water runs toward the feedlot, a diversion should be used to redirect it around the lot.

Diversions can be as simple as an earthen berm or a diversion terrace. Ditches such as road ditches will protect lots. Buildings can serve as diversions at the tops of lots. To be effective, building roofs must slope away from the lot, or be guttered to prevent roof runoff from entering the lot. Concrete curbs, feedbunks, fences, or solid wooden fences are also good diversion devices. Before considering what to do with feedlot runoff, consider what to do with



feedlot influent, and how to keep it away from the lot. Curbs, bunks, and fences can be used to keep dirty water on a lot, as well as keeping clean water off. Use diversions such as these to control lot runoff and direct it to a settling basin in a controlled manner.

For Open Feedlot Operators

Lots should ideally slope from 2 to 4 percent so they drain quickly but erosion is not excessive. Mounds are desirable even on sloping lots. Mounds should be constructed up and down the slope, not across it, of good quality compacted soil with very little organic matter. Use 5:1 side slopes, allow 30 to 35 sq. ft. per head, and extend the mound onto the concrete apron. Cattle should be able to go from the concrete bunk apron to the mound without wading through a pothole. Do not use manure to construct your mounds.

The more humid the climate, the more important good drainage becomes. If mud, or poor drainage is a problem, consider using more concrete in your lot to avoid potholes, mud, and poor cattle performance. Good concrete pads around waterers and along bunks are of great benefit to avoid potholes. Concrete aprons should be wide enough to accommodate the tractor and bucket. A curb along the back of the apron helps retain water and manure on the apron as well as minimize erosion along the apron, especially in steep lots. Complete concrete lots are an option, and become more desirable as the climate becomes more humid.

## Management

### *Lot maintenance*

Regular maintenance of both earthen and concrete lots is a key element in minimizing adverse impacts. Scraping earthen lots is the most important management task. Keeping lots scraped not only minimizes messy conditions when wet, but also minimizes dust during dry periods. Manure accumulates near waterers and feedbunks. Scrape those areas more frequently. Fill low spots with good compacted soil; don't use scraped manure to fill low spots or build mounds. Keeping lots smooth improves drainage by preventing water from standing in hoof prints and/or potholes. On earthen lots, don't scrape all the way to the soil; try to leave a thin layer (~1/2 inch) of manure. In earthen lots, an impermeable soil/manure interface forms, which minimizes infiltration and protects groundwater.

Stocking rate effects lot condition. If your lot is poorly drained, don't stock it as heavily and it will stay firmer with fewer potholes. The higher the stocking rate (fewer square feet per head), the more often scraping is needed. While earth lots stocked at 250 square feet per head may be scraped once a month, concrete lots stocked at 50 square feet per head will accumulate approximately 1 inch of manure every three days, and should be scraped at least once a week. Watching the weather forecast and scraping just ahead of predicted rainfall events helps reduce pollutants in feedlot runoff.

If scraped solids can't be land applied immediately, stack them on impermeable well-drained sites. Avoid building manure stacks or compost piles in low spots or drainage ways, and keep them as far from water resources as practical. Well-drained, impermeable sites protect groundwater as well as providing all-weather access to stockpiles for easy stacking and hauling. Plow and recompact the site to eliminate macropores before starting the stack. Composting manure by frequent turning helps the manure break down faster, minimizes odors, and makes nutrient concentrations more uniform. If you have a runoff catchment basin locate the stack so that any drainage enters the basin. Stacks should be removed, and the manure land applied as soon as possible; they should not be permanent.

### *Runoff Control*

All runoff should pass through a settling basin, as it leaves the lot, to remove settleable solids. Properly designed and managed settling basins will remove up to 60 percent of the solids. (See VFS publication for design). Basins should be cleaned frequently, and maintained so they drain well and solids dry down quickly. Check settling basin outlets for plugging immediately after rain. Unplug them if necessary to speed dewatering. Once the solids are settled, the runoff may or may not have to be captured and contained, depending on the lot size, and the sensitivity of nearby water resources. If the lot capacity is 1000 head or more, the runoff will most likely have to be captured.

## SOLUTIONS

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If runoff is captured, good containment management is essential. Containments should be designed to DNR specifications. The single most important practice is timely pumping so that uncontrolled overflow doesn't occur. Every retention pond should have a depth indicator marked with the "start pumping" elevation and the "never exceed" elevation. Other BMP's for ponds include mowing, preventing and or repairing erosion, and frequent inspections for seepage, rodents, and erosion. To best utilize the runoff liquid, sample it for nutrients and use it for crop production.

If the runoff is not captured, release it so that it doesn't pollute nearby water resources. Release it into cropped or pastured areas, through a vegetative filler strip (see VFS publication), or other treatment device. Do not release it into road or drainage ditches, or toward any tile surface inlet. If the lot is too close to a nearby stream, a serpentine type diversion may allow more filtration and treatment of the settling basin effluent. Treatment alternatives, depending on size and location may include vegetative filter strips, infiltration areas, constructed wetlands, and various combinations of them.

## BMP CHECKLIST FOR OPEN FEEDLOTS

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### Diversions above the lot

- Terraces
- Curbs
- Roof gutters

### Lot maintenance

- Concrete – frequent scraping
  - ◆ At least twice a week, more often better
  - ◆ Scrape completely
- Earthen – frequent scraping
  - ◆ Maintain smooth lots that drain well
  - ◆ Eliminate soft spots & potholes
  - ◆ Rebuild/maintain mounds & access lanes
  - ◆ Maintain surface next to concrete pads
  - ◆ Removing soft manure to minimize dust
  - ◆ Do not puncture soil/manure interface seal

### Handling scraped solids

- Immediate land application
- Stockpiled solids
  - ◆ Stack on impermeable, well drained surface
  - ◆ All weather access
  - ◆ Minimize infiltration
  - ◆ Compost if desired
  - ◆ Haul out as soon as land is available and weather permits

### Maintain waterers properly

- Eliminate wet spots and pot holes

### Control runoff

- All runoff through settling basins
- Capture or release per regulations (depends on size)
- Release through treatment mechanism/area when appropriate
- Remove solids from settling basin often

### "Treatment" alternatives

- Capture and land apply
- VFS
- Infiltration
- Wetland
- Combinations

### Manage

- Depends on the system, but all require management
- Review and improve**

## SOLUTIONS

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