



Livestock Heavy Use Area

Introduction

Livestock heavy use areas, also referred to as HUAs, are any outside areas where livestock use or traffic is concentrated over time. These areas may include feed lots, handling areas, exercise areas, watering areas, laneways, or even calf pens or hutches. It is important to analyze what purpose each HUA is serving and whether it is necessary in its size and/or existence. Runoff from a HUA may be contaminated and potentially degrade the quality of ground and surface water sources.

Environmental Concerns

Livestock heavy use area runoff may contain high levels of nutrients from manure and waste feed, eroded soils, pathogens, and any other debris associated with the specific use of the area. Concentrations of nutrients, especially nitrogen and phosphorus, can degrade water quality, threaten aquatic habitats, and contaminate drinking water supplies. Nearby drinking water supplies such as wells, ponds, and streams may be severely impaired by the excessive nutrients, and pathogens. The quantity of contaminated runoff can often be greatly increased by large contributing watersheds including landscapes and barn roofs which flow through the HUAs.



Proper operation and maintenance, as well as implementing a combination of structural and cultural BMPs can significantly reduce the risk of HUA runoff contaminating a water source.

Potential Economic Benefits

Proper protection and treatment of HUAs and their associated runoff can yield significant economic benefits. Successful collection and treatment of HUA runoff



will help preserve water resources and protect drinking water supplies from becoming contaminated. Large scale water treatment systems may be avoided as well as the potential for the contributing landowner to be assessed fines. Stabilized and well cleaned areas will promote animal health and reduce pathogens and their associated diseases. Collected manure and waste feed can be land

applied according to the facility's Comprehensive Nutrient Management Plan (CNMP), thus potentially reducing imported fertilizer costs. Clean, functioning HUAs may also improve overall facility aesthetics, neighbor relations, and value of property.

Summary of Best Management Practices

Reduce the size, Relocate, or Eliminate any HUAs that have runoff concerns.

- Size of HUA should be appropriate for the designated use.
- Limit the amount of time the animals are congregating on the HUA.
- Poor site conditions with adjacent Highly Sensitive Areas (HSA) may warrant relocation of fences to distance the HUA from HSAs or complete HUA relocation.
- Possibly compliment the goals of the HUA with a well managed pasture system.

Keep Clean Water from Entering the HUA.

- Proper drainage, diversions, roof gutters/drip trenches with underground outlets, and roofs/covers keep clean water from mixing with nutrients, sediments, and other materials on the HUA. This reduces volume of contaminated runoff, improves site conditions, and reduces treatment costs.
- Repair leaking watering facilities.

Collect and Manage HUA Runoff.

- Any manure, waste feed, or contaminated water should be collected and/or treated.
- Separated solid material generated on the HUA may be collected and land applied according to the CNMP.
- Liquids may be diverted to a properly sized storage or vegetated treatment area.

Use Natural Resources Conservation Service Approved Conservation Practices.

- Best Management Practices (BMP's) are designed to minimize water contamination and treat runoff associated with HUAs.

Summary of Regulations

State Regulations

[NYS Department of Environmental Conservation CAFO Permit](#)

Federal Regulations

[EPA General Information on CAFOs](#)



Background Information for Worksheets

What is the Vegetated flow distance from the HUA to the nearest watercourse?

Maintaining a long vegetated flow distance between the livestock heavy use area and the nearest watercourse will help prevent water contamination from contaminated runoff. Vegetated flow distances greater than 300 feet should provide adequate protection from contaminated runoff reaching a watercourse, unless there are concentrated flows within this buffer zone. As flow distances decrease less than 300 feet, the potential for runoff entering the watercourse increases. Flow distance length and slope percentage will also play important roles in determining which BMPs will be appropriate if runoff treatment is necessary.



What is the characteristic of the vegetation cover that surface water flows through?

As stated above, long vegetated flow distances decrease the potential for contamination to nearby water sources or highly sensitive areas. The characteristic of the vegetation cover that surface water flows through after running off of the heavy use area will help determine the risk level. Not only does vegetation slow runoff allowing for water infiltration into the soil, there are also biological and physical processes at work helping to filter and absorb nutrients leaving the HUA. Thick, permanent vegetation such as grass with low slopes is ideal; however crop rotations with continuous cover or woodlots provide fair protection as well. Fields with row crops and heavy tillage practices, abused pastures, bare ground, steeper slopes and especially concentrated flow paths, are all scenarios increasing runoff risks.

What is the farmer's main objective for the HUA? (i.e. heat detection, exercise, fresh air, etc.)

Determine the landowner/operator objectives for the heavy use area in regards to the overall livestock management at the facility. Livestock heavy use areas are found at facilities for several reasons; used as livestock holding areas during barn cleanings, feeding or watering areas, resting areas outside the barn for fresh air and exposure to sunlight, exercise areas, and areas to observe heat detection (breeding) throughout the herd. Depending on the objectives and the site constraints, the HUA could be eliminated, relocated, resized, or protected with structural and cultural management practices.

For More Information

NRCS – [Heavy Use Area Protection \(561\) Standard](#)

What is the square footage of the HUA?

Evaluate the square footage of the HUA to determine if it sized properly for the livestock use designated for the area. An area that is oversized provides a scenario that may be contributing additional runoff or may be difficult to operate and maintain properly.

Is the HUA sized right for the number of animals?

Livestock heavy use areas should be sized properly to suit the animal numbers and the designated use for the area. The AEM Tier 2 worksheet provides a table for the livestock HUA size guidelines. Oversized HUAs may have inflated collection and treatment costs.

Background Information for Worksheets

How long are animals on the HUA daily?

Livestock heavy use areas will see varying amounts of use depending on the function of the area and the management style of the operator. Some facilities use these areas for specific purposes and animal time can be controlled or limited, however, some facilities may have large open areas where livestock have unlimited access. The amount of manure deposited on the HUA depends on the frequency and duration of livestock use. Livestock frequency, duration, and manure deposits will play a role in operation and maintenance requirements and the sizing of a vegetated treatment area, if one is necessary. HUAs with lengthy use times should be designed to accommodate frequent equipment access and manure collection.

Are animals in the HUA over the winter months?

HUAs used during the winter months pose several additional management concerns. Freezing of manure and snow make equipment access and manure collection difficult. Vegetated treatment areas (VTA) function at a severely reduced level during frozen conditions, spring thaw, and whenever the plant and bacteria biological processes enter a dormant period. Spring snow melt will increase runoff concerns, even more than a rainfall event during the growing season. A designed amount of frozen or dry manure may be stacked on the barnyard away from flow paths to facilitate storage before spreading.



Where are wells in relation to the HUA?

Livestock heavy use areas should not exist in close proximity to wells or any drinking water supply. To reduce the risk of contaminating a water source, HUAs should be located down slope from the drinking water source. If runoff leaves the HUA, it more likely will be travelling away from the water supply. Any wells adjacent to HUAs should be tested for contaminants, evaluated for depth, construction, compliance with health department standards, and include an estimation of the recharge area to see if further protection measures should be installed to minimize risk.

What are the drainage characteristics of the soil in the HUA and adjacent flow path?

Knowing the soil type around the area and its characteristics is very important. The more permeable and well drained the soil is, the more likely it is that groundwater may be affected by contaminated runoff. Soil type is not the only contributing factor. The slope and slope length greatly affect the drainage of a HUA, especially an unpaved area. Steeper slopes drain well, however runoff concerns increase. There should be a balance between slope, slope length, and the drainage requirements necessary to promote a dry area that is easy to clean.

For More Information

[NRCS Web Soil Survey](#)

Define Area of Interest:

Soil Data Explorer → Soil Properties & Qualities → Soil Qualities & Features → Drainage Class

Background Information for Worksheets

What is the depth to the high water table under unpaved HUAs and adjacent flow paths?

If the livestock heavy use area is located in an area where the water table is high or near the surface the risk of contaminating groundwater increases. The area will also be more difficult to stabilize and manage due to soggy soils, especially if there are ground seeps or springs nearby. Any drainage installed to control the water table should be designed carefully to protect it from inadvertent contamination.

What is the depth to bedrock under unpaved HUAs and adjacent flow paths?

If the livestock heavy use area is located in an area where depth to bedrock is minimal, the risk of contaminating groundwater increases. As runoff leaves the heavy use area or infiltrates (gravel HUA), there is less material for it to have to flow through making it easier to reach and contaminate groundwater. Specific attention should be placed in areas that are known to have shallow bedrock or more importantly, Karst topography or limestone bedrock.

How often is the HUA cleaned?

Evaluate the operator's management style of the livestock heavy use area. The cleaning frequency should match the frequency and duration of animal use, as well as the type of system in place. An unpaved area should be scraped on a regular basis to reduce runoff concerns, however deep scraping to the soil layer will destroy the interface layer. The interface layer is the layer formed between the manure and soil, essentially compacted manure, which limits liquid percolation into the ground water. The interface layer also limits liquid percolation in the ground water. Scraping of unpaved areas should not disturb the bottom 3" of material above the soil, thus protecting the interface layer and reducing the removal of valuable soil that will be costly to replace.

Paved heavy use areas with heavy livestock use should be cleaned frequently, especially on an area without total collection and treatment. This cleaning schedule can have a large effect on the size of the VTA. Rainfall events will affect how much manure is left on the pad after cleaning. A frequent cleaning schedule will limit the stress placed on a system during runoff events.



Are there curbs or push walls and are they functioning?

Curbs and push walls are needed tools to contain manure on the HUA while also aiding in the cleaning/ collection of manure solids and diverting runoff to a designated area or treatment system. Inspect any curbs or push walls for cracks and evaluate if the height of the curbs and push walls are adequate. Many heavy use areas may have timber curbs; inspect these carefully for decay and other damage. Roll curbs are common practices to allow for outside equipment access for cleaning, maintenance and livestock traffic; evaluate if a roll curb would improve

maintenance or if existing curbs are sufficient in controlling runoff.

Fences to contain the animals and minimize direct deposit on drip trenches or other adjacent clean water structures need to be installed and maintained. Gates and access roads for equipment access are needed as well.

Background Information for Worksheets

Are the paved areas in good shape (can be scraped clean and with minimal cracks)?

Livestock HUA should have a firm surface and a firm foundation, whether it's paved asphalt, concrete, or simply compacted gravel with geo-textile fabric. A HUA with a solid surface can be scraped and cleaned with collected material properly applied to the land base. Depending on the structure and the site conditions, any cracks should be examined to determine if a resource concern exists and if additional crack or joint treatment is needed. For concrete surfaces, grooves should be installed on the surface to prevent hoof slippage.

Is clean water (including roof water, upslope runoff, and animal watering sources) kept separate from manure?

Clean water should be excluded from the HUA to prevent mixing with manure, waste feed, or disturbed sediments and running off. Common types of clean water exclusion are footer drains/ drip trenches, diversions, shaping and grading, drop inlets with underground outlets, and roof gutters. It is important to maintain all clean water exclusions to ensure that they function properly. Watering facilities that are leaking should be repaired.

A roof or cover is another method that excludes clean water from the livestock HUA. Preventing clean rain water and snow from falling on the HUA is necessary when other treatment options such as vegetated treatment areas are not feasible.



For More Information

NYS ANSACP – [Screening Tool for Roofs and Covers for Heavy Use Areas, Barnyards, and Feedlots](#)

Is HUA runoff controlled?

Inspect the HUA to see if manure, wastewater, or contaminated runoff is flowing or seeping away from the HUA. Runoff control involves minimizing contamination (keeping clean water clean) and collecting and treating runoff via solids management and storage or VTA systems for liquids. Many HUAs will have little or no runoff control. The risk of contaminating runoff depends on site conditions and any adjacent Highly Sensitive Areas.

Is there a VTA receiving runoff from the HUA?

A vegetated treatment area (VTA) can be an effective practice to treat runoff from a livestock HUA. A VTA is defined as an area of permanent vegetation used for agricultural wastewater treatment. If designed properly, it will help improve water quality by reducing the loading of contaminants from agricultural operations. To be designed properly, the VTA must be planned based on the type of nutrients to be treated and its ability to hold and take in nutrients. Proper operation and maintenance of the VTA is crucial to ensure its effectiveness over time.

A key component to a functioning VTA system is a settling facility that precedes the vegetative infiltration area. The purpose of a settling facility is to separate the solids (manure, waste feed, ice/snow) from the liquids; only liquids should enter the VTA. Settling or separation of these materials may be accomplished through several processes such as; gravity/settling tank or pond, filtration/screens, or evaporation. Separated solids should be collected and applied to the land according to a nutrient management plan.

For More Information

[NRCS Vegetated Treatment Area \(635\) Standard](#)

Background Information for Worksheets

If yes, has Nitrate Leaching Index evaluation and soil phosphorus testing been completed on the VTA?

Nitrate Leaching Index evaluation is an indicator of the potential for nitrate to reach groundwater. Soil phosphorus testing is simply evaluating the soil for phosphorus loading and done using a method known as the Morgan P soil test or another equivalent. The Morgan P soil test involves shaking the soil sample with a chemical solution to extract the concentrated phosphorus. Both procedures (Nitrate Leaching Index and soil phosphorus test) need to be completed before the VTA is constructed to determine if the site is appropriate. Failure to complete the evaluations could result in a poorly located VTA that could have a high potential of contaminating water resources. Abandon HUAs should be cleared of organic matter as the aerobic decomposition of these areas can add to nitrate loading.

For More Information

[Cornell University Nutrient Management Spear Program](#)

[Cornell University Phosphorus Soil Testing Methods](#)



Does the HUA lead to a pasture system? Are there gates present to minimize inappropriate congregating?

Many livestock heavy use areas serve only to aid in the immediate functions of the barn facility (holding areas for cleaning, heat detection, and exercise). Livestock use of these areas tends to dead end, meaning livestock do not have further access to a pasture system. On the other hand, many facilities will have a pasture system to compliment what is happening in the barn and on the heavy use area. These areas should have distinct and well managed gate systems to separate the different areas of use and prevent livestock loafing and heavy use area expansion.

Look for opportunities to improve the overall pasture system and the livestock traffic patterns to and from the HUA. Once again, the heavy use areas should be minimized to reduce runoff concerns and treatment costs. Examine the pasture's watering system; inadequate watering facilities will tend to develop large heavy use areas around them, possibly warranting protection. Heavily used animal trails and laneways adjacent to Highly Sensitive Areas should also be examined for resource concerns. Lightly used areas may benefit from reseeding with a species that tolerates and persists under heavy use conditions.

SUMMARY

AEM Tier 2 Assessments document environmental stewardship and establish benchmark conditions on the farm. They also identify resource concerns and areas of opportunity. The AEM Tier 2 worksheets also help to further establish baseline data that can be used to prioritize issues for Tier 3 planning.

Tier 2 Assessments should be completed on-site with the farmer. When the initial assessment is completed, appropriate feedback in the form of an AEM Tier 2 Worksheet Summary should be provided to the farmer. The summary should include an overall level of concern for the worksheet, explanation of the overall ranking, a list and description of items of greatest concern, as well as, documentation of what is being done well and what areas need improvement. After the evaluation is complete, the farm should be given a ranking which will determine their priority to advance to the AEM Tier 3 planning phase. Appropriate ranking categories that could be used are: High, Medium, or Low Priority. A ranking procedure that has been approved by your local AEM Team should be used to make the ranking determinations.

