Facility Operation and Management

1. Check backfill areas around facilities often for excessive settlement. Determine if settlement is caused by consolidation, piping or failure of the structure walls or floor. Necessary repairs must be made. Refer to safety items.

2. Check walls and floor often for cracks and/or separations and make needed repairs. Check earth berms and embankments for sloughing, erosion or settlement. Maintain embankment and backfill elevations as specified in the design. Check a minimum of two times a year and when the facility is empty. Maintain design elevation of berms and fill.

3. Outlets of foundation drains should be checked frequently and kept open. The outflow from these drains should be checked periodically when the storage facility is being used to determine if there is leakage from the facility into these drains. Leakage may be detected by the color and smell of the outflowing liquid, by lush dark green growth of vegetation around the outlet, by the growth of algae in the surface ditch or by the vegetation being killed by the outflowing liquid. If leakage is detected, repairs should be planned and made to prevent the possible contamination of groundwater. Refer to safety items when planning and making repairs. Quarterly samples should be collected from foundation drains as required by the Livestock Management Facilities Act.

4. Divert surface water away from the storage facility. Check the channels and berms of the clean water diversions around the barnyard, buildings and storage facility frequently. Channels must be protected from erosion and berms must be maintained at proper height so the diversion channels have adequate capacity. These channels and berms should not be used as haul roads unless they were designed and constructed as haul roads.

5. Check frequently for burrowing animals around buildings, structures, berms and backfill. Remove them and repair any damage.

6. Inspect haul roads and approaches to and from the storage facility frequently to determine the need for stone, gravel or other stabilizing material.

7. Do not allow runoff from loading areas and/or spills to flow into streams or road ditches.

8. Install and maintain a marking or gauge post that clearly shows the design, one-half, and full levels of the facility.

9. Repair or replace any rusted or damaged metal and paint.

10. A good vegetative cover of recommended grasses should be maintained on earth berms and embankments. If the vegetative cover is damaged, it should be reseeded as soon as possible. The vegetative cover should be mowed at least twice a year to control weeds, encourage vigorous growth and discourage rodent activity.

11. Immediately repair any vandalism, vehicular or livestock damage to the facility, the surrounding area, or any appurtenances.

12. Pump-out shall commence when the deep pit facilities are approximately 1' from the bottom of the slats and should continue until the depth is reduced to approximately 1'.

Nutrient Application Equipment Calibration

Commercial Fertilizer Application Equipment Calibration:
The nitrogen applicator, the commercial broadcast spreaders, and corn planter will be set per the manufacturers recommendations then filled with a known amount and checked over known acreage. Adjustments will be made to achieve the planned rates.

Manure Spreader/Tanker Calibration
There are several methods that can be used to calibrate the application rate of a manure spreader. The two best methods are the load-area method and the plastic sheet method. It is desirable to repeat the calibration procedure 2 to 3 times and average the results to establish a more accurate calibration.

Before calibrating a manure spreader, the spreader settings such as splash plates should be adjusted so that the spread is uniform. Most spreaders tend to deposit more manure near the spreader than at the edge of the spread pattern. Overlapping can make the overall application more uniform. Calibrating application rates when overlapping is involved requires measuring the width of two spreads and dividing by two to get the effective spread width.

Calibration should take place annually or whenever manure is being applied from a different source or consistency.

Load-Area Method
The load-area method is the most accurate and can be used for most types of manure handling. This method consists of determining the amount (volume or weight) of manure in a spreader and the total area over which it is applied. The most accurate method to determine the amount of manure in a spreader is to weigh the spreader when it is full of manure and again when it is empty (portable pad scales work well for this). The difference is the quantity of manure applied over the area covered. Spreader capacities listed by the manufacturers can be used to determine the amount of manure in the spreader. However care must be taken when using manufactures spreader capacities. Heaped loads, loading methods and manure type may vary considerably from what is listed by manufacturers of box and side delivery manure spreaders. Spreader capacities for liquid tankers are accurate provided the tanker is filled to the manufactures recommended levels, and no foam is present in the tank.

The area of spread is determined from measuring the length and width of the spread pattern. Measuring can be done with a measuring wheel, measuring tape or by pacing.

The application rate is calculated using the following formula:

Spreader capacity (tons or gallons) X 43560 sq. ft/acre = Application Rate tons or Gallons/Acre Distance traveled X Spreading width

Plastic Sheet Method

The plastic sheet method can only be used with solid or semi-solid manure. This method of calibrating spreader application rates involves 1) cutting a plastic sheet to the specified dimensions (56 inches X 56 inches), 2) weighing the clean plastic sheet, 3) laying out the plastic sheet on the ground and driving the manure spreader (applying manure at a recorded speed and spreader setting) over the sheet, 4) weighing the plastic sheet with the manure on it, and 4) determine the net weight of the manure on the sheet (weight of manure and sheet - weight of the clean sheet), and 5) the net pounds of manure equals tons per acre applied.

When calibrating manure spreaders, all details regarding tractor speed and manure spreader settings and date(s) of each calibration should be recorded with manure application information, and directly on the equipment. Mark equipment to ensure a known application rate is applied each time the referenced tractor speed and spreader settings are used. Manure spreader settings can include such things as: fast and slow settings on some box spreaders, gate position on side delivery spreaders and splash plate position and fill levels on liquid tankers.

Operation & Maintenance
Composting Facility

1. Develop a specific recipe (amounts and order) for this facility to determine the compost mixture.
2. A compost mix that encourages aerobic microbial decomposition and avoids nuisance odors should be used.
3. The initial compost mix should result in a carbon to nitrogen (C:N) ratio between 25:1 and 40:1. Higher C:N ratios may be used if nitrogen immobilization is not a concern.
4. A dependable carbon source of carbonaceous material with a high C:N ratio shall be stored and available to mix with N rich waste materials.
5. Bulking materials shall be added to the mix as necessary to enhance aeration. Bulking materials may be the C material used in the recipe mix (preferred), or a non-biodegradable material that is salvaged at the end of the compost period. If the later method is used, a method of salvaging these materials at the end of the composting period will need to be developed.
6. Moisture should be maintained in the compost between 40-65%.
7. Facility covers are preferred to reduce excess moisture, and avoid potential runoff concerns.
8. Compost mix must be turned or aerated at a frequent interval to attain the desired amount of moisture removal and temperature control, while maintaining aerobic degradation.
9. Continue the composting process long enough for the compost mix to reach the stability level where it can be safely stored without undesirable odors. Test the finished compost as needed.
10. Minimize odors and nitrogen loss by selecting C material that , when blended with the N material provides a balance of nutrients and porous texture for aeration.
11. A chemical neutralizing agent should be used if structural components do not provide adequate odor reduction.
12. Maximize solar warming by aligning piles north to south configured with moderate side slopes.
13. Protect compost from wind in cold climates.
14. Observe safety precautions when handling, aerating, loading, and spreading composting materials.
15. Make adjustments throughout the composting period to insure proper composting processes.
16. Closely monitor temperature above 165^{o}F. Take action immediately to cool piles that have reached temperatures above 185^{o}F.
17. Composting is a biological process. It requires a combination of art and science for success. Thus, new compost facilities may require continual work in order to ensure a smooth & successful composting process